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PI/PD Name: Edward Seidel

Gender: ☒ Male   ☐ Female

Ethnicity: (Choose one response)   ☐ Hispanic or Latino   ☒ Not Hispanic or Latino

Race:
(Select one or more)
☐ American Indian or Alaska Native

☐ Asian

☐ Black or African American

☐ Native Hawaiian or Other Pacific Islander

☒ White

Disability Status:
(Select one or more)
☐ Hearing Impairment

☐ Visual Impairment

☐ Mobility/Orthopedic Impairment

☐ Other

☐ None

Citizenship: (Choose one)   ☒ U.S. Citizen   ☐ Permanent Resident   ☐ Other non-U.S. Citizen

Check here if you do not wish to provide any or all of the above information (excluding PI/PD name):   ☒

REQUIRED: Check here if you are currently serving (or have previously served) as a PI, co-PI or PD on any federally funded project   ☒

Ethnicity Definition:
Hispanic or Latino. A person of Mexican, Puerto Rican, Cuban, South or Central American, or other Spanish culture or origin, regardless of race.
Race Definitions:
American Indian or Alaska Native. A person having origins in any of the original peoples of North and South America (including Central America), and who maintains tribal affiliation or community attachment.
Asian. A person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent including, for example, Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, the Philippine Islands, Thailand, and Vietnam.
Black or African American. A person having origins in any of the black racial groups of Africa.
Native Hawaiian or Other Pacific Islander. A person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands.
White. A person having origins in any of the original peoples of Europe, the Middle East, or North Africa.

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Collection of this information is authorized by the NSF Act of 1950, as amended, 42 U.S.C. 1861, et seq. Demographic data allows NSF to gauge whether our programs and other opportunities in science and technology are fairly reaching and benefiting everyone regardless of demographic category; to ensure that those in under-represented groups have the same knowledge of and access to programs and other research and educational oppurtunities; and to assess involvement of international investigators in work supported by NSF. The information may be disclosed to government contractors, experts, volunteers and researchers to complete assigned work; and to other government agencies in order to coordinate and assess programs. The information may be added to the Reviewer file and used to select potential candidates to serve as peer reviewers or advisory committee members. See Systems of Records, NSF-50, "Principal Investigator/Proposal File and Associated Records", 63 Federal Register 267 (January 5, 1998), and NSF-51, "Reviewer/Proposal File and Associated Records", 63 Federal Register 268 (January 5, 1998).

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PI/PD Name: Brian D Athey

Gender: ☒ Male   ☐ Female

Ethnicity: (Choose one response)   ☐ Hispanic or Latino   ☐ Not Hispanic or Latino

Race:
(Select one or more)
☐ American Indian or Alaska Native
☐ Asian
☐ Black or African American
☐ Native Hawaiian or Other Pacific Islander
☐ White

Disability Status:
(Select one or more)
☐ Hearing Impairment
☐ Visual Impairment
☐ Mobility/Orthopedic Impairment
☐ Other
☒ None

Citizenship: (Choose one)   ☒ U.S. Citizen   ☐ Permanent Resident   ☐ Other non-U.S. Citizen

Check here if you do not wish to provide any or all of the above information (excluding PI/PD name):   ☐

REQUIRED: Check here if you are currently serving (or have previously served) as a PI, co-PI or PD on any federally funded project   ☒

Ethnicity Definition:
Hispanic or Latino. A person of Mexican, Puerto Rican, Cuban, South or Central American, or other Spanish culture or origin, regardless of race.
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Black or African American. A person having origins in any of the black racial groups of Africa.
Native Hawaiian or Other Pacific Islander. A person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands.
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PI/PD Name: Sarah M Nusser

Gender: ☐ Male   ☒ Female

Ethnicity: (Choose one response) ☐ Hispanic or Latino   ☒ Not Hispanic or Latino

Race:
(Select one or more)
☐ American Indian or Alaska Native
☐ Asian
☐ Black or African American
☐ Native Hawaiian or Other Pacific Islander
☒ White

Disability Status:
(Select one or more)
☐ Hearing Impairment
☐ Visual Impairment
☐ Mobility/Orthopedic Impairment
☐ Other
☐ None

Citizenship: (Choose one) ☒ U.S. Citizen   ☐ Permanent Resident   ☐ Other non-U.S. Citizen

Check here if you do not wish to provide any or all of the above information (excluding PI/PD name):   ☒

REQUIRED: Check here if you are currently serving (or have previously served) as a PI, co-PI or PD on any federally funded project   ☒

Ethnicity Definition:
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PI/PD Name: Beth A Plale

Gender: ☐ Male   ☒ Female

Ethnicity: (Choose one response)   ☐ Hispanic or Latino   ☒ Not Hispanic or Latino

Race:
(Select one or more)
☐ American Indian or Alaska Native
☐ Asian
☐ Black or African American
☐ Native Hawaiian or Other Pacific Islander
☒ White

Disability Status:
(Select one or more)
☐ Hearing Impairment
☐ Visual Impairment
☐ Mobility/Orthopedic Impairment
☐ Other
☒ None

Citizenship: (Choose one)   ☒ U.S. Citizen   ☐ Permanent Resident   ☐ Other non-U.S. Citizen

Check here if you do not wish to provide any or all of the above information (excluding PI/PD name):   ☐

REQUIRED: Check here if you are currently serving (or have previously served) as a PI, co-PI or PD on any federally funded project   ☒

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PI/PD Name: Joshua Riedy

Gender: ☐ Male   ☐ Female

Ethnicity: (Choose one response)   ☐ Hispanic or Latino   ☐ Not Hispanic or Latino

Race:
(Select one or more)
☐ American Indian or Alaska Native
☐ Asian
☐ Black or African American
☐ Native Hawaiian or Other Pacific Islander
☐ White

Disability Status:
(Select one or more)
☐ Hearing Impairment
☐ Visual Impairment
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☐ Other
☐ None

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List of Suggested Reviewers or Reviewers Not To Include (optional)

SUGGESTED REVIEWERS:
Not Listed

REVIEWERS NOT TO INCLUDE:
Not Listed

COVER SHEET FOR PROPOSAL TO THE NATIONAL SCIENCE FOUNDATION

PROGRAM ANNOUNCEMENT/SOLICITATION NO./CLOSING DATE/if not in response to a program announcement/solicitation enter NSF 15-1		**FOR NSF USE ONLY**
NSF 15-562 **06/24/15**		**NSF PROPOSAL NUMBER**

FOR CONSIDERATION BY NSF ORGANIZATION UNIT(S) (Indicate the most specific unit known, i.e. program, division, etc.)

IIS - Big Data Science &Engineering

1550320

DATE RECEIVED	NUMBER OF COPIES	DIVISION ASSIGNED	FUND CODE	DUNS# (Data Universal Numbering System)	FILE LOCATION
06/24/2015	1	05020000 IIS	8083	041544081	06/24/2015 5:47pm

EMPLOYER IDENTIFICATION NUMBER (EIN) OR TAXPAYER IDENTIFICATION NUMBER (TIN) **376000511**	SHOW PREVIOUS AWARD NO. IF THIS IS ☐ A RENEWAL ☐ AN ACCOMPLISHMENT-BASED RENEWAL	IS THIS PROPOSAL BEING SUBMITTED TO ANOTHER FEDERAL AGENCY? YES ☐ NO ☒ IF YES, LIST ACRONYM(S)

NAME OF ORGANIZATION TO WHICH AWARD SHOULD BE MADE **University of Illinois at Urbana-Champaign**	ADDRESS OF AWARDEE ORGANIZATION, INCLUDING 9 DIGIT ZIP CODE **SUITE A** **1901 SOUTH FIRST ST.** **CHAMPAIGN, IL 61820-7473**
AWARDEE ORGANIZATION CODE (IF KNOWN) **0017756000**	
NAME OF PRIMARY PLACE OF PERF **University of Illinois at Urbana-Champaign**	ADDRESS OF PRIMARY PLACE OF PERF, INCLUDING 9 DIGIT ZIP CODE **University of Illinois at Urbana-Champaign** **506 S. Wright Street** **Urbana ,IL ,618013620 ,US.**

IS AWARDEE ORGANIZATION (Check All That Apply) (See GPG II.C For Definitions)	☐ SMALL BUSINESS ☐ FOR-PROFIT ORGANIZATION	☐ MINORITY BUSINESS ☐ WOMAN-OWNED BUSINESS	☐ IF THIS IS A PRELIMINARY PROPOSAL THEN CHECK HERE

TITLE OF PROPOSED PROJECT   **BD Hubs: MIDWEST: SEEDCorn: Sustainable Enabling Environment for Data Collaboration**

REQUESTED AMOUNT $ **1,250,000**	PROPOSED DURATION (1-60 MONTHS) **36** months	REQUESTED STARTING DATE **09/01/15**	SHOW RELATED PRELIMINARY PROPOSAL NO. IF APPLICABLE

THIS PROPOSAL INCLUDES ANY OF THE ITEMS LISTED BELOW

☐ BEGINNING INVESTIGATOR (GPG I.G.2)
☐ DISCLOSURE OF LOBBYING ACTIVITIES (GPG II.C.1.e)
☐ PROPRIETARY & PRIVILEGED INFORMATION (GPG I.D, II.C.1.d)
☐ HISTORIC PLACES (GPG II.C.2.j)
☐ VERTEBRATE ANIMALS (GPG II.D.6) IACUC App. Date _____
    PHS Animal Welfare Assurance Number _____
☒ FUNDING MECHANISM **Research - other than RAPID or EAGER**

☐ HUMAN SUBJECTS (GPG II.D.7) Human Subjects Assurance Number _____
   Exemption Subsection _____ or IRB App. Date _____
☐ INTERNATIONAL ACTIVITIES: COUNTRY/COUNTRIES INVOLVED (GPG II.C.2.j)

_____

☒ COLLABORATIVE STATUS
Not a collaborative proposal

PI/PD DEPARTMENT **National Center for Supercomputing Appl**	PI/PD POSTAL ADDRESS **1205 W Clark St** **1008 NCSA Building, MC-257** **Urbana, IL 61801** **United States**
PI/PD FAX NUMBER **217-244-8195**	

NAMES (TYPED)	High Degree	Yr of Degree	Telephone Number	Email Address
PI/PD NAME **Edward Seidel**	**PhD**	**1988**	**217-244-0078**	**eseidel@ncsa.illinois.edu**
CO-PI/PD **Brian D Athey**	**PhD**	**1990**	**734-615-5914**	**bleu@umich.edu**
CO-PI/PD **Sarah M Nusser**	**PhD**	**1990**	**515-294-9773**	**nusser@iastate.edu**
CO-PI/PD **Beth A Plale**	**PhD**	**1998**	**812-855-4373**	**plale@cs.indiana.edu**
CO-PI/PD **Joshua Riedy**	**DEd**	**2007**	**701-777-4278**	**joshua.riedy@und.edu**

CERTIFICATION PAGE

Certification for Authorized Organizational Representative (or Equivalent) or Individual Applicant

By electronically signing and submitting this proposal, the Authorized Organizational Representative (AOR) or Individual Applicant is: (1) certifying that statements made herein are true and complete to the best of his/her knowledge; and (2) agreeing to accept the obligation to comply with NSF award terms and conditions if an award is made as a result of this application. Further, the applicant is hereby providing certifications regarding conflict of interest (when applicable), drug-free workplace, debarment and suspension, lobbying activities (see below), nondiscrimination, flood hazard insurance (when applicable), responsible conduct of research, organizational support, Federal tax obligations, unpaid Federal tax liability, and criminal convictions as set forth in the NSF Proposal & Award Policies & Procedures Guide, Part I: the Grant Proposal Guide (GPG). Willful provision of false information in this application and its supporting documents or in reports required under an ensuing award is a criminal offense (U.S. Code, Title 18, Section 1001).

Certification Regarding Conflict of Interest

The AOR is required to complete certifications stating that the organization has implemented and is enforcing a written policy on conflicts of interest (COI), consistent with the provisions of AAG Chapter IV.A.; that, to the best of his/her knowledge, all financial disclosures required by the conflict of interest policy were made; and that conflicts of interest, if any, were, or prior to the organization's expenditure of any funds under the award, will be, satisfactorily managed, reduced or eliminated in accordance with the organization's conflict of interest policy. Conflicts that cannot be satisfactorily managed, reduced or eliminated and research that proceeds without the imposition of conditions or restrictions when a conflict of interest exists, must be disclosed to NSF via use of the Notifications and Requests Module in FastLane.

Drug Free Work Place Certification

By electronically signing the Certification Pages, the Authorized Organizational Representative (or equivalent), is providing the Drug Free Work Place Certification contained in Exhibit II-3 of the Grant Proposal Guide.

Debarment and Suspension Certification   (If answer "yes", please provide explanation.)

Is the organization or its principals presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded
from covered transactions by any Federal department or agency?   Yes ☐   No ☒

By electronically signing the Certification Pages, the Authorized Organizational Representative (or equivalent) or Individual Applicant is providing the Debarment and Suspension Certification contained in Exhibit II-4 of the Grant Proposal Guide.

Certification Regarding Lobbying

This certification is required for an award of a Federal contract, grant, or cooperative agreement exceeding $100,000 and for an award of a Federal loan or a commitment providing for the United States to insure or guarantee a loan exceeding $150,000.

Certification for Contracts, Grants, Loans and Cooperative Agreements

The undersigned certifies, to the best of his or her knowledge and belief, that:
(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure of Lobbying Activities," in accordance with its instructions.
(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, Title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

Certification Regarding Nondiscrimination

By electronically signing the Certification Pages, the Authorized Organizational Representative (or equivalent) is providing the Certification Regarding Nondiscrimination contained in Exhibit II-6 of the Grant Proposal Guide.

Certification Regarding Flood Hazard Insurance

Two sections of the National Flood Insurance Act of 1968 (42 USC §4012a and §4106) bar Federal agencies from giving financial assistance for acquisition or construction purposes in any area identified by the Federal Emergency Management Agency (FEMA) as having special flood hazards unless the:
(1)   community in which that area is located participates in the national flood insurance program; and
(2)   building (and any related equipment) is covered by adequate flood insurance.

By electronically signing the Certification Pages, the Authorized Organizational Representative (or equivalent) or Individual Applicant located in FEMA-designated special flood hazard areas is certifying that adequate flood insurance has been or will be obtained in the following situations:
(1)   for NSF grants for the construction of a building or facility, regardless of the dollar amount of the grant; and
(2)   for other NSF grants when more than $25,000 has been budgeted in the proposal for repair, alteration or improvement (construction) of a building or facility.

Certification Regarding Responsible Conduct of Research (RCR)
(This certification is not applicable to proposals for conferences, symposia, and workshops.)

By electronically signing the Certification Pages, the Authorized Organizational Representative is certifying that, in accordance with the NSF Proposal & Award Policies & Procedures Guide, Part II, Award & Administration Guide (AAG) Chapter IV.B., the institution has a plan in place to provide appropriate training and oversight in the responsible and ethical conduct of research to undergraduates, graduate students and postdoctoral researchers who will be supported by NSF to conduct research.
The AOR shall require that the language of this certification be included in any award documents for all subawards at all tiers.

CERTIFICATION PAGE - CONTINUED

Certification Regarding Organizational Support

By electronically signing the Certification Pages, the Authorized Organizational Representative (or equivalent) is certifying that there is organizational support for the proposal as required by Section 526 of the America COMPETES Reauthorization Act of 2010. This support extends to the portion of the proposal developed to satisfy the Broader Impacts Review Criterion as well as the Intellectual Merit Review Criterion, and any additional review criteria specified in the solicitation. Organizational support will be made available, as described in the proposal, in order to address the broader impacts and intellectual merit activities to be undertaken.

Certification Regarding Federal Tax Obligations

When the proposal exceeds $5,000,000, the Authorized Organizational Representative (or equivalent) is required to complete the following certification regarding Federal tax obligations. By electronically signing the Certification pages, the Authorized Organizational Representative is certifying that, to the best of their knowledge and belief, the proposing organization:
(1) has filed all Federal tax returns required during the three years preceding this certification;
(2) has not been convicted of a criminal offense under the Internal Revenue Code of 1986; and
(3) has not, more than 90 days prior to this certification, been notified of any unpaid Federal tax assessment for which the liability remains unsatisfied, unless the assessment is the subject of an installment agreement or offer in compromise that has been approved by the Internal Revenue Service and is not in default, or the assessment is the subject of a non-frivolous administrative or judicial proceeding.

Certification Regarding Unpaid Federal Tax Liability

When the proposing organization is a corporation, the Authorized Organizational Representative (or equivalent) is required to complete the following certification regarding Federal Tax Liability:

By electronically signing the Certification Pages, the Authorized Organizational Representative (or equivalent) is certifying that the corporation has no unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted or lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability.

Certification Regarding Criminal Convictions

When the proposing organization is a corporation, the Authorized Organizational Representative (or equivalent) is required to complete the following certification regarding Criminal Convictions:

By electronically signing the Certification Pages, the Authorized Organizational Representative (or equivalent) is certifying that the corporation has not been convicted of a felony criminal violation under any Federal law within the 24 months preceding the date on which the certification is signed.

AUTHORIZED ORGANIZATIONAL REPRESENTATIVE	SIGNATURE	DATE
NAME **Stephanie L Fellmann**	**Electronic Signature**	**Jun 24 2015 5:46PM**
TELEPHONE NUMBER **217-265-7682**	EMAIL ADDRESS **russel33@uillinois.edu**	FAX NUMBER

PROJECT SUMMARY

Overview:

BD Hubs: Midwest:SEEDCorn: Sustainable Enabling Environment for Data Collaboration, E. Seidel, UIUC. The nation faces increasing challenges in collecting, managing, serving, mining, and analyzing rapidly growing and increasingly complex data and information collections to create actionable knowledge and guide decision-making. All sectors of society are profoundly impacted and need novel solutions that leverage the breadth of expertise in academia, industry, and government. To address this need, a diverse and committed network of partners has created a nimble and flexible regional Midwest Big Data Hub (MBDH), responding to Big Data challenges, capturing special opportunities, interests and resources unique to the Midwest. Within MBDH, our proposed NSF SEEDCorn project will leverage partner activities and resources, building a sustainable framework to coordinate existing projects, initiate 20-30 new partnerships, start new pilots, and help acquire funding. It will develop and link collaborations, education, and services around data, involving diverse institutions (universities, non-profits, foundations, national labs, companies, government agencies) in the Midwest region and beyond.MBDH has formed a distributed hub and governance structure. The hub supports activities that aggregate expertise, projects and resources, enabling communities to assemble and function along multiple spokes, including specific themes of importance to the Midwest (across three broad themes of society, natural/built environments, and biomedical sciences). Integrative rings connect all spokes and are organized around themes of data sciences, tools and services needed to collect, store, link, serve, and analyze complex data collections, and educational activities to advance the knowledge base and train a new workforce in the practice and use of data science and services. Groups across the region are naturally incentivized to work together as they all realize that the challenges they face are larger than any single group, institution, state, or region can adequately address alone.SEEDCorn will leverage many existing projects represented by MBDH partners, funded by NSF, NIH, DOE, NIST, DOC, USDA, universities and the private sector. Outcomes will be multifold, including: (a) strengthening, creating and securing funding for 20-30 new public-private partnerships; (b) accelerating technology transfer projects; (c) introducing new Big Data educational activities into universities, industry and government, including data policies, management, social impacts and best practices; (d) starting pilots in a common data environment hosted by the National Data Service; and (e) developing and implementing new sustainability models.

Intellectual Merit :

Collecting, harnessing, analyzing, managing, servicing, and sustaining large, complex data sources constitute grand challenges of our age. MBDH will address both the multidisciplinary challenges of creating and supporting collaborations around complex problems and the cyberinfrastructure challenges around creating data services to support them by creating a nimble, efficient and effective organizational and intellectual framework. Energizing MBDH, SEEDCorn will build vibrant intellectual partnerships along existing and future themes and will operationalize their complex research problems, exploiting a common platform (NDS Labs) for linking and creating data services. Spokes can be created as interest and opportunity evolves. Integration of diverse communities with common interests will aggregate data collections in broad themes, which are cross-connected to facilitate scientific and sharing policy discussions, as well as aligning educational interests. Bottom-up partnership building between academic, industry, nonprofit, and government organizations and individuals will be combined with rapid and responsive top-down big data and knowledge sharing, making MBDH responsive to emerging opportunities and changing conditions.

Broader Impacts :

This is an unusually large and diverse consortium of partners, far exceeding usual NSF grants, built from the ground up. In addition to universities of all shapes and sizes across the region, the consortium is built to create and sustain academic-industry-government partnerships, with reach into all sectors of the Midwest. The project includes an experienced diversity coordinator to leverage relationships with national organizations, use social networking tools, and reach into public libraries. Keywords: data communities and services, public-private partnerships, diverse populations.

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Appendix Items:

*Proposers may select any numbering mechanism for the proposal. The entire proposal however, must be paginated. Complete both columns only if the proposal is numbered consecutively.

C. Project Description

The nation faces increasing challenges in collecting, managing, serving, mining, storing, and analyzing rapidly growing and increasingly complex data and information collections in order to create actionable knowledge and to guide decision-making. All sectors of society are profoundly impacted and in need of novel solutions that leverage the breadth of expertise in academia, industry, and government at all levels, including setting policy and developing best practices. For example, important relationships between food, water, and energy need to be understood to assess their availability and safety, requiring integration of data across multiple sectors (e,g., agriculture, U.S. Army Corps of Engineers, industry, academia) and with multiple approaches to data science (e.g., genetic sequencing, GIS, simulation, machine learning).

Many data-intensive activities have sprung up around the nation and the world in the last decade, on campuses, in government, and throughout industry, with programs funded by many public and private organizations. While novel approaches are rapidly developing in many isolated settings, they fail to benefit from insights and tools created through other thematic and methodological activities (e.g., physics workflow planning could be applied in multi-sensor environmental data acquisition). In addition, some problems, such as statistical disclosure limitation, are pervasive and immense, requiring integration of numerous approaches and perspectives. A major need has therefore developed to create overarching hubs that provide structures to aggregate and organize activities, and importantly to build and support communities that cross all these sectors to harness the power and realize the promise of Big Data.

To address this need, the Universities of Illinois, Indiana, Michigan, North Dakota, and Iowa State have created a nimble and flexible regional Midwest Big Data Hub [1] (MBDH), with a network of diverse and committed regional supporting partners (including colleges, universities, and libraries; non-profit organizations; industry; city, state and federal government organizations; see *Partnerlist* supplement document) who bring data projects from multiple private, public, and government sources and funding agencies (including NSF, NIH, DOE, NIST, USDA, DOD and others). MBDH is a consortium to better enable the Midwest region and partners across the nation to respond to these Big Data challenges and to capture special opportunities, interests and resources unique to the Midwest. As a framework for developing and deeply linking collaborations, education, and services around data, MBDH was created to facilitate partnerships between diverse institutions. Operating within MBDH, our proposed *SEEDCorn* project will leverage partner activities and resources, coordinating existing projects, initiating new partnerships, sharing best practices and data policies, starting pilots, and helping to acquire funding. It will develop and link collaborations, education, and services around data, involving numerous institutions in the Midwest and beyond.

As illustrated in Figure 1, MBDH lead institutions and partners in the consortium form a distributed hub that aggregates expertise, projects and resources from their members, enabling and supporting communities to assemble and function along multiple *spokes*, focusing on specific strengths and themes of importance to the Midwest across three sectors: *Society* (including smart cities and communities, network science, business analytics), *Natural & Built World* (including food, energy, water, digital agriculture, transportation, advanced manufacturing), and *Healthcare and Biomedical Research* (which spans patient care to genomics). At the same time, integrative "*rings*" connect all spokes and will be organized around themes of specific MBDH strengths, including (a) *Data Science*, where computational and statistical approaches can be developed and integrated with domain knowledge and societal considerations that support the underlying needs of "data to knowledge,"

Figure 1. MBDH hub (center) linking thematic spokes of members across the Midwest. Cross-cutting rings provide additional connections between spokes.

(b) *services, infrastructure, and tools* needed to collect, store, link, serve, and analyze complex data collections, to support pilot projects, and ultimately provide production-level data services across the hub, and (c) *educational activities* needed to advance the knowledge base and train a new generation of data science-enabled specialists and a more general workforce in the practice and use of data science and services. MBDH has many partners, with working groups led by individuals for each spoke and ring area, as described in the *Partnerlist*.

MBDH will support basic structures (communication, governance, administration, planning) and services (data service hosting, portals, development environments) needed for communities to grow and develop, to communicate with each other and with other hubs nationally. The *SEEDCorn* project will build on these existing structures to catalyze action and create new partnerships. MBDH partners have committed to build and support the hub, assembling many existing projects and funding sources from university, state, federal, and industry sources. The NSF-funded *SEEDCorn* project will leverage these and energize specific activities of the hub, contributing to a full-time executive director (at Illinois), and to part-time personnel at all five institutions (including a project manager and a technical support person at Illinois and local coordinators at all PI sites). A particular strength of MBDH is its existing array of data service projects and cyberinfrastructure offerings, which can be brought together through the National Data Service (NDS) Labs (C.4). NDS Labs will be used for creating data linking and pilot projects across MBDH and beyond, using *SEEDCorn* funds. Very importantly, *SEEDCorn* will fund the costs of travel and a number of workshops, hackathons, training and other events at our member institutions. A number of events are being planned, including a *SEEDCorn*-funded all-hub kickoff workshop in October 2015 at Illinois; each is designed to grow partnerships and catalyze additional actions, including the creation of new funding opportunities (C.8 has a timeline of activities). Hence, *SEEDCorn*-funded activities are front-loaded in year one (Y1) and ramp down as new funded activities are generated. A sustainability plan has been developed to grow funding sources as *SEEDCorn* ramps down, described in C.8. We will mix university, state, industry and agency-funded projects, with community-developed open source and fee-for-service models and will explore new economic models around data partnerships and licensing. By the end of the third year of the project we anticipate that funding from *SEEDCorn* will not be needed to sustain the MBDH.

Another specific strength of MBDH is its focus on education, training and diversity. The region is home to some of the nation's leading computer, informatics and computational science programs and major HPC centers (C.4), and we will combine existing regional activities with specific training programs and hackathons using NDS Labs, creating new data-intensive educational programs and best-practice guidelines that will benefit all hubs (C.3). On diversity, the region is rich in underserved populations, including African-American, Hispanic, and Native American populations. An experienced diversity leader (Franklin, see *Partnerlist*) leads a working group and activities for MBDH.

We have developed a dynamic governance model that allows the organization to support and grow initial partnerships and communities, as well as a process to support the creation of new communities over the lifetime of the project. As described in C.6, we have formed an interim steering council, with working groups around each existing spoke and ring, and developed a process for launching an elected Steering Council (SC) by March 1, 2016.

SEEDCorn will leverage and connect many existing partnerships across the Midwest and beyond, catalyzing many new partnerships. Specific outcomes of *SEEDCorn* will be many, including: (a) strengthening and creating numerous public-private partnerships, built on a stronger funding base, with new projects funded by multiple agencies, government organizations, and industry as a result of workshops and other *SEEDCorn* events; (b) projects will not operate in isolation, but will be better connected through MBDH; (c) new educational activities and best practices will be developed by our collaborations and introduced into the curricula of leading colleges and universities nationally; (d) *SEEDCorn*-supported pilots in a common data service environment through use of NDS Labs will lead to

innovation, interlinking and acceleration of data services across dozens or potentially hundreds of projects; and (e) new business models for sustainable data solutions will be developed and implemented.

C.1. Initial Partners, Projects and Overall Collaboration Plan

Led by five universities geographically distributed across the Midwest, initial MBDH partners cover a wide range of institutions, including non-profits, over two dozen industry partners, city and state government organizations, national labs, small colleges, and rural and major state and private research universities. Many letters of collaboration have been collected, detailing some of the institutions' specific interests; additionally, initial leadership roles in key areas of importance have been defined. Operating within MBDH, the NSF *SEEDCorn* project will fund specific activities detailed below that are designed to (a) catalyze and build 20-30 sustainable interdisciplinary public-private data partnerships for research, education, and economic development, and (b) to support pilot projects that link existing data services and explore new ones across the region and with other Hubs.

Highlighting just a few institutions and their roles in leading specific partnerships, the University of Illinois at Urbana-Champaign will take the overall leadership role, hosting the executive director and project manager (both supported in part by *SEEDCorn*) to oversee and manage hub activities, strengthening interdisciplinary partnerships and building new ones, while also leading the National Data Service Labs environment that will support data-sharing projects and pilots (technical support provided in part by *SEEDCorn*). Indiana University will lead data and network science; Michigan will lead healthcare and biomedical research, transportation, and will coordinate business analytics with Wayne State; and Iowa State will lead digital agriculture. Non-profit UILabs in Chicago will lead industry partnerships and advanced manufacturing, while the University of Chicago will lead smart cities and communities. University of North Dakota leadership will be primarily in the area of cross-cutting activities involving Unmanned Aerial Systems (UAS) as they pertain to digital agriculture, transportation, and the food-energy-water nexus. The full list of existing partnerships, with specific leaders, is provided in the *Partnerlist*. Twelve working groups already operate and have produced white papers describing their initial activities, to be made available on the MBDH website (midwestbigdatahub.org).

Collaboration Plan: Building sustainable private-public partnerships is a key goal of MBDH, and key to success is collaboration through both electronic and personal interactions. To foster collaboration in a cost-effective way, we will emphasize teleconferences and web-based collaborative spaces and tools, including monthly meetings of the SC. We will also use web-based sharing of educational materials and programs. The MBDH will allow the Hub to engage with stakeholders, share information about best practices and data strategies, provide access to data tools and repositories, and importantly, provide access to a common, open data services development environment.

Personal engagement is needed for organizational strength and sustainability. The executive director and SC members will be supported by *SEEDCorn* to travel, coordinate and share knowledge among constituencies along several dimensions: connecting existing data projects (e.g. SEAD, DataONE, DataFour) related to spokes and rings that can be leveraged toward the Hub goals; support of regional events and meetings where MBDH initiatives can be presented and discussed; development of potential new spokes and rings as challenges and needs emerge; engagement of organizations like the Research Data Alliance (RDA) and NDS for broader impact and adoption of standards; coordination and communication with other regional Hubs. *SEEDCorn* will support a month of *local coordinators* at all co-PI sites for true engagement across all geographic regions of the MBDH. *SEEDCorn* will also support travel to key MBDH personnel to annual multi-hub meetings organized by NSF.

Very importantly, *SEEDCorn* funding has been designed to frontload workshop and event activities at all five MBDH co-PI sites, with a burst of activity in the first year (Y1) to ignite key hub and spoke collaborations and activities to start strong, with a specific emphasis on developing external funding streams. As external funds are generated for projects over time (from a variety of state and federal agencies, private foundations, and industry), a smaller number of *SEEDCorn*-funded events will occur in

years two and three. A *SEEDCorn*-funded all-hands kickoff meeting at Illinois in fall 2015 will include an interim SC meeting, sustainability discussions, and initial spoke-oriented project planning. A second all-hands meeting will be held in spring 2016 with a fully elected SC operating by March 2016. A timeline for *SEEDCorn*-funded workshops, hackathons, and other events is described in C.8, detailing the locations and approximate dates for each planned event. Additional workshops, funded by NSF during future BD Hubs phases, are anticipated as groups organize and seek additional funding.

MBDH Projects Already Planned with Funding from *SEEDCorn*: MBDH has developed over a dozen partnerships among its initial membership, with working groups already developing concepts for projects. C.5 describes the kinds of projects our current partners (see *Partnerlist*) are developing around eight *spokes* and connecting *rings*, around educational, industry, and sustainability activities. Here we highlight just a few, and discuss mechanisms for growing these activities through *SEEDCorn*.

Project 1 A partnership between MBDH and the National Data Service (NDS) (C.4, **Towns Letter**) will support federation of data services and pilot projects (**Norman, Krishnamurthy Letters)**. MBDH will work with the NDS Labs environment to assess needs of projects ongoing in our partnerships. *SEEDCorn* requests support for senior personnel to facilitate a pilot project that links various data services, providing common tools that may be used by others. Projects involved include three DIBBS projects (Illinois), SEAD (Michigan), Materials Data Service (University of Chicago) and others. NDS Labs will be a common hosting and development environment, accelerating collaboration and development of new projects. The ***Data Tools and Services Ring*** will have a *SEEDCorn*-funded workshop at Illinois (C.8).

Project 2 MBDH Digital Agriculture and related spoke and ring partners (See ***Natural & Built World Spokes***, C.5) will host a workshop at Iowa State (C.8) that brings together diverse stakeholders (producers, ag industry and commodity groups, researchers in agriculture, natural resources, rural sociology, engineering, and data science) to address the most pressing issues and opportunities in improving our capacity to integrate, protect, share, and analyze information that leads to actionable knowledge to support farm productivity, environmental sustainability, and rural well-being. Topics include precision agriculture, ecosystem services, related biosciences, and socio-economic impacts. The workshop will establish and extend partnerships to address specific issues or develop new approaches, tools, and resources that advance the resiliency and sustainability of agricultural and rural life.

Project 3 The ***Health & Biomedical Research (HBR) Spoke*** (C.5) will host a workshop at Michigan (C.8) on developing an open data translational biomedical research repository. The project will use the tranSMART platform, leverage the infrastructure of the Open Cloud Consortium (C.4), combining expertise of Michigan, the University of Chicago, and industry connections (pharma, biotech, nonprofit, academia) of the tranSMART Foundation (SC, **Letter**). The workshop will bring together interested parties from across the MBDH to define, fund, and ultimately implement a sharable HBR open data repository of use to MBDH participants and beyond to other NSF BD Hubs.

Developing New Big Data Partnerships: Within MBDH, *SEEDCorn*-funded activities will support members to build new partnerships, engaging state and local government and industry for support. Successfully engaging new partners requires understanding their needs, which can be many: conducting research and problem solving, developing workforce and talent, building infrastructure, accessing expertise, and sharing of knowledge and information. The expected benefits will depend on the type of partnership—university, industry, government, non-profit—and the goals of the partners. For example, university partners may see value in networking with industry partners through Hub activity, giving them an increased understanding of industry challenges and opportunities. Industry partners will gain access to skilled, experienced data-focused researchers, to human capital for workforce development, to cutting-edge discoveries, and will have influence on new curricula development. Governmental and non-profit partners will benefit from interactions with academia and industry, discussions of big data challenges and possible solutions, and training and internship opportunities. In addition, the Hub will provide shared benefits such as workshops, conferences, publications, and liaisons to other regional Hubs. We will work toward the stated goal of building 20-30 new partnerships catalyzed by *SEEDCorn* within MBDH.

Cross hub collaboration plan: Four proposed hubs (PIs: McKeown, Seidel, Norman, Aluru and Krishnamurthy, **Letters**) have agreed on a collaboration plan that includes development of joint educational activities, workshops, data sharing and communication initiatives. We propose to share best practices and innovations in education and to coordinate a cross-hub workshop on education, including workforce development. For shared spoke topics, we will ensure that the overlapping spokes complement and support each other. For example, if a spoke from a particular region proposes a workshop at a conference, they will include spoke members from the other three hubs in the workshop design and promotion. Additionally, for regional in-hub meetings (e.g., the Northeast proposes to have these twice per year), each of the other three hubs will send a representative. To aid in cross-regional cooperation and transparent communication among the four hubs, we propose that a representative from each hub form a subcommittee to inform development of a shared, federated environment for data sharing, linking data services, exploring common file formats, and supporting pilot projects that span multiple hubs or may be national in scale; case studies of completed projects will be made available to all hubs. This committee will also inform the adaptation of the hubs to progress in Big Data and the developing interests of hub partners. Finally, the four hub leadership teams will have quarterly phone meetings with one another in addition to discussions at the NSF annual meeting.

C.2. Sustainability

Sustainability has been considered from MBDH's inception, designed as an ecosystem of multiple approaches to business models involving financial and in-kind support of universities and non-profits, fees for private industry, contracts with government organizations, and grants from foundations and traditional agencies (e.g. NSF, NIH). Data services will be supported via mechanisms in which MBDH partners have significant experience, including open-source community development, software as a service (e.g., as Globus operates), and possibly commercialization of services. *SEEDCorn* is designed to catalyze MBDH projects that become self-sustaining (via university, state, non-profit, agency, and/or private industry funds). While funding from sponsoring agencies will be sought (e.g., NSF funding for spokes), MBDH projects are envisioned to operate after *SEEDCorn* funding ends.

Sustainability is a key focus of the SC, which will deliver a detailed sustainability plan by Year 2. A representative from industry leads an SC group on this topic (C.6 and *Partnerlist*). Success will depend in part on MBDH offerings matching partner needs. Members must see value in the partnership, which can be expressed as willingness to pay membership dues and/or to invest in-kind time and energy. Incentives include (1) input and access to workforce development, (2) access to infrastructure and/or expertise, and (3) sharing knowledge, information and data.

MBDH brings significant experience with industry collaborations. Following lessons learned over three decades since the national supercomputing centers were launched and private sector programs were created, we will develop public-private partnerships around data in stages. MBDH has undertaken an initial inventory of numerous partner relationships operating around our region (e.g., UI Labs, NCSA's Private Sector Program, others). In initial discussions, companies have shown great interest in being among the first to join MBDH, and over two dozen companies have signed letters of collaboration outlining areas of interest and detailing "in kind" commitments of staff time to work with MBDH.

We will build on momentum to have other companies join our efforts, further defining interests. Working groups will be formed around common topics, sharing best practices in big data applied to many business sectors, and determining what kinds of pilot projects might be carried out. The pilots may include developing data sharing projects with university research groups, providing advanced data management technologies to companies, and applying advanced business analytics techniques.

The final stage will involve implementing business models for sustaining MBDH activities around specific services and resources, building on successful aspects of existing private sector programs (in many cases with the same companies) that have sustained themselves for decades.

These stages have been designed to scale to partnerships on the state and local level. The MBDH has numerous partnerships previously started by members of the PI team and the SC; we will further develop such partnerships during the life of this award as they contribute to the sustainability of Hub activities.

C.3. Education

Current high demand for big data professionals across industry, academia and government is substantially growing, leading to a critical need for well-trained *data scientists*. McKinsey predicts a shortage of nearly 200,000 professionals in data science and data related jobs in the US [2] and—despite a high median salary [3] of over $117,500—the job market supply will not fill these positions [4] [5].

The MBDH will work to address the challenges of providing effective instruction in big data and satisfying the current and future nation-wide shortage of big data experts across academia, industry, government and non-profits. The goal of the MBDH education ring is to impact Midwest big data sectors through training, outreach and extension, providing coordination, resources and tools to develop a skilled workforce, and to help train the existing workforce in solving real-world big data problems.

While most big data research activities take place at large research-intensive (R1) universities, smaller institutes of higher education carry the responsibility of training the majority of the IT and data science workforce. Therefore, our educational efforts will be geared toward the involvement of small universities (represented in the Steering Council; see *Partnerlist*). The MBDH will provide a unique opportunity for smaller universities to be involved with big data education and research and will expose students in computer science, statistics, mathematics, and in related fields to big data training aimed at developing practical solutions to real-world problems. That unique and critically important experience will be pivotal in the preparation of trainees for becoming big data experts in the present and future job market.

The MBDH will address these needs and will optimize the use of resources by facilitating collaboration between small and large institutes and with industry and government sectors that can offer applications for project-based instruction. Data brought to the attention of the hub, such as transportation or smart city data, will allow students from all institutions, including small colleges, to design and implement solutions using actual problems and real-world data. That will also provide institutions with access to domain scientists who contributed the data or study them, and we fully anticipate these interactions will help MBDH develop continuing education opportunities that will enable the current workforce to expand their knowledge and skills. Because the hub will share computing facilities, underfunded universities and industry will be able to take advantage of available cycles at research universities' computing facilities.

SEEDCorn will coordinate to develop a portal for education, training, outreach and diversity that will integrate information on resources, materials, courses and opportunities related to data sciences. The portal will facilitate partnerships within the hub and across hubs, e.g. linking organizations needing solutions to student engagement to integrate student learning in data science and application fields via a mentored practical experience (e.g., live cases, capstone projects) and advertising tools and services for education (e.g. providing real-world data sets, allowing students to share software solutions). We have identified Steering Council roles to be taken on by Franklin (Senior Personnel (SP)) for diversity and Shamir (SP) for small colleges (See *Partnerlist*).

SEEDCorn will collect information on big data and data science learning options in the region. This will allow sharing of information and options for collaboration as the region's academic institutions build undergraduate, graduate, and continued education curricula, including online and hybrid options such as the specialization in data curation offered by the School of Library and Information Science at Illinois.

In the above activities, we will work with NDS (C.4) to facilitate workshops, training sessions, data and software carpentry, and hackathons and datathons, and to highlight numerous data services and how they can be used in research and education, as well as with numerous other projects ongoing in the Hub.

C.4. Resources

Curated datasets and computational tools to process the data are at the heart of MBDH. Datasets, when properly curated and annotated, serve as a foundation of new economic development and the basis for educational projects and new tools development. The **Data Sciences Ring** (Co-PI Plale) will work with the data providers on behalf of the MBDH collective to create agreements and recommend tooling (e.g., similar to DataONE federation protocols) that allow the data sets to be as open and available as possible to the MBDH community. **The Data Sciences Ring** will strive to harmonize access to MBDH assets.

Numerous data collections have been offered for inclusion in MBDH. The datasets with links to MBDH span from genomics, the earth and atmosphere, materials, texts from great works of science and literature, and social science. We are working with providers to obtain data on transportation and smart cities. Data collections often come with restrictions on their use. The Midwest is host to a number of projects that provide persistent services for interaction with and analysis of sensitive data. Built around an important data set, these services support prior work of data extraction, data cleaning, and data synthesis that takes place before and during analysis itself. Analysis services that provide secure computation on a protected collection are often the only access that is available to the collection. The data collections and service environments already identified are listed here. The Data Science ring will focus its attention on secure computational environments and will identify common services that could benefit MBDH members in the spokes, including certifying repositories as trusted repositories (e.g., Data Seal of Approval). A sampling of MBDH data collections includes:

Genomic Data Genomic data on tumor types from more than 10,000 patients, stored and harmonized by the Genomic Data Commons to advance and transform the study of cancer. *The National Center for Genome Analysis Support (NCGAS)* provides services for analysis of genomic information (transcriptome and genome assembly, phylogenetics, metagenomics/transcriptomics and community genomics).

Materials Research Data *The Materials Data Facility* was established recently to serve as a repository for preservation and sharing of materials research data from both simulations and experiments.

Social Science Data *Inter-University Consortium for Political and Social Research* maintains an archive of more than 500,000 documents in the social sciences. It hosts 16 specialized collections of data in education, aging, criminal justice, substance abuse, terrorism, and other fields. Restricted-use demographic, economic and health microdata are available through the *Central Plains Research Data Center Bureau of the Census*. *Terra Populus* [6] (DataNet) integrates world population and environmental data, including surveys, land cover information from remote sensing, climate records, and land use from statistical agencies. TerraPop data, interoperable across time, space, and scientific domain, inform the dramatic transformation of the earth's inhabitants and their environment. *Iowa State, Michigan, Illinois, Chicago, and Wisconsin survey research programs* offer methodological expertise for household and land-based surveys based on emerging data collection environments and integration of complex survey, administrative and geospatial data resources. Illinois' *Cline Center for Democracy* [7] has an unmatched collection of data, information and millions of documents from media such as The New York Times.

Atmospheric and Earth Surface Data *USGS Earth Resources and Science Center* holds the world's largest civilian collection of images of the Earth's surface, including satellite images, aerial photography, elevation and land cover datasets, and digitized maps. The archive spans from old (1937) aerial photographs to millions of satellite images of the Earth's surface, starting with the original Earth orbits in the 1960's and first Landsat satellite in 1972, to current hourly additions of satellite images. *NOAA observational data*: NOAA gathers 20 terabytes of observational data every day. A real-time copy of this data will soon be accessible at the Open Cloud Consortium (OCC) in Chicago, augmented with curating and management services. *Polar Geospatial Center* [8] (PGC), an NSF-funded research organization supporting polar science and operations, holds an extensive collection of satellite imagery and aerial photography at varying resolutions, including those from the Alaskan High Altitude Aerial Photography (AHAP) Program, Antarctic TMA Aerial Photographs, Landsat and MODIS imagery, among others. In

collaboration with the USGS's Antarctic Resource Center, the PGC holds and digitally preserves the entire reconnaissance mapping series and satellite maps to support polar science and operations.

Digital Humanities Data The *HathiTrust Research Center* provides digital text analysis services on copyrighted data. A secure environment for digital humanities analysis, it will soon have 13.4M digitized books (4.7 billion pages) of the HathiTrust Digital Library (62% protected under copyright).

Core Data Services MBDH has among its membership three research funded prototype services that provide data curation and publishing services. MBDH will be able to leverage and use these technologies but also provide to these projects new opportunities to apply those technologies in other domains. *SEAD* (DataNet; Michigan, Indiana, Illinois) is an NSF-sponsored project to create data services designed to meet the needs of sustainability science research, offering a controlled and simple workflow for publishing complex and simple data sets to an array of back-end repositories and storage servers. *Through the Timely and Trusted Curation and Coordination* framework and system, materials-to-devices digital data can be captured, curated, correlated and coordinated in a real-time and trusted manner before fully archiving and publishing the data for wide access and sharing. The NSF-funded *Kurator* project (Illinois and Harvard) is developing tools for automating data curation workflows, focusing on biodiversity data and specimen collection data from natural history museums.

Core data services of MBDH also include identity, profile and group management, third-party data movement, and extraction and conversion tools. *Globus Nexus* provides identity, profile, and group management as a service. It enables users to create a unique identity that can be used across services and allows the creation and management of groups. High-performance, secure, third-party data movement and synchronization between endpoints, provided by Globus Transfer, is critical for moving large amounts of data. Extraction and conversion tools integrated into *Brown Dog*, a framework for plugging in data extraction and conversion tools to facilitate data interoperability, are available. Tools for synthesizing large-scale spatial data are anticipated through two projects: *CyberGIS* [9] and *SpatialHadoop* [10].

Computational, Data, and Visualization Resources The *National Data Service (NDS)* is operated by a consortium of universities, HPC centers, libraries, funded projects, and publishers across all four NSF hub regions that is developing and linking community data sharing services (NDS Share), as well as an open community development environment (NDS Labs) where groups can work together to extend and link existing core services (e.g., those above) and pilot new ones. Primary MBDH partners include Illinois, Chicago, Michigan, and Notre Dame, with other key partners at SDSC (Western Hub), TACC (Southern Hub), and Harvard (Eastern Hub). NDS Labs is a common development platform to support data sharing, linking services, and pilot projects within and across hubs. For example, DataONE (led in the Western Hub) will work with NDS to expose its data discovery services; *iRODS* (led in the Southern Hub; **Letter**) will be available in NDS for data federation. Such collaborations will lead to cross-linking of activities at both scientific and data service levels. The MBDH and the Western Hub (led by NDS partner SDSC; **Letter**) will jointly provide leadership in supporting this environment for all four regional hubs.

The Midwest has numerous large-scale HPC centers: NCSA, Indiana, Minnesota Supercomputing Institute, Iowa State, Nebraska-Lincoln, Argonne, and the Open Science Grid with major anchor points in Wisconsin, Indiana, and Nebraska. Regional/national optical network organizations provide the best optical network footprint in the nation, anchored by NSF StarLight at Northwestern, MREN (Midwest Research and Education Network), Great Plains Network, and many more. Experimental facilities also generate data (FermiLab, the Advanced Photon Source) and carry out visualization (UIC's Electronic Visualization Laboratory, Iowa State's Virtual Reality Applications Center).

C.5. Spokes and Rings

MBDH has already developed activities around eight thematic *spokes*, three cross-connecting *rings* (including education), and industry, shown in Figure 1 (see *Partnerlist*; governance in C.6). Leaders of each activity chair working groups that have developed concept papers with initial plans. Space does not permit a full description of all these activities but the MBDH website has been created with contact

information for each activity; as documents are refined they will be made available publicly and updated as they develop. In this section, we have combined these rings into three general overlapping areas, *Society*, *Natural & Built World*, and *Healthcare & Biomedical Research (HBR)*, as well as one cross-cutting ring area on *Data Sciences and Services*. We describe the challenges, aspects that are unique to the MBDH, and the initial plans to grow the activities.

Society Spokes Globalization and technological, demographic and environmental changes present enormous challenges in the sustainability, resilience and health of modern societies. Although a vast array of spatiotemporal data are generated by cities, communities, governments, businesses and citizens (e.g., public transportation, traffic, vehicles, cadastral information, utilities, law enforcement, sales, inventories, supply chains, personal smart phones), effectively addressing these challenges will information systems that represent interconnections and interdependencies within the societal system, enabling the shift in focus from objects to interactions. At present, we lack the partnerships, data infrastructure and knowledge required to fully harness the potential that lies with seamlessly integrating available and emerging data resources to respond to critical short- and long-term forces arising in numerous societal contexts. To fully capitalize on these opportunities, people and organizations need (1) access and search capabilities across data within and across entities; (2) standards for defining, organizing, managing, and connecting data with specific contexts; (3) methods for heterogeneous spatial and temporal reference systems; (4) appropriate analytic methods to extract value and generate actionable knowledge from Big Data, as well as methodologies to protect the privacy and confidentiality of individuals and organizations; (5) training opportunities for the current workforce; and (6) a larger supply of data science-savvy graduates interested in solving these challenges in specific contexts that arise in the public and private sectors.

Several MBDH spokes (Network Science, Smart Cities and Communities, Transportation, Business Analytics) will facilitate partnerships among researchers, communities, governments, nonprofits and businesses toward improving the effectiveness, safety, efficiency and effectiveness of how society and its members function. A key characteristic of the Midwest is its heterogeneous spatial distribution, and a corresponding variability in capacity to store, manage and analyze information to address societal challenges. For example, *SEEDCorn* will build on experience and programs associated with partnerships between universities and cities (e.g., the University of Chicago with the City of Chicago (**Letter**), Wayne State University with Detroit (**Letter**), Missouri working with St. Louis) to develop an open-source next-generation data analytics architecture to support city and academic workflows. A prototype of this architecture is the open-source Plenario1 platform, funded by NSF CISE, which serves as a starting point and has been optimized for (1) Chicago's predictive analytics needs, (2) San Francisco's Sustainable Districts evaluation needs, and (3) scientific inquiry from the NSF EHR/SBE-funded Urban Sciences Research Coordination Network2 as well as from the University of Chicago's Data Science for Social Good summer fellowship program. These efforts can be extended to address issues faced by smaller communities that have moderate or limited capacity to develop their own data systems. Extension networks in MBDH land-grant institutions can be leveraged to assist in educating and porting solutions to communities and citizens in rural areas.

Natural & Built World Spokes As a society, and particularly in the Midwest, we face major problems with fresh water, food and agriculture, and energy provisioning that we must address hand-in-hand with transportation and manufacturing demands. Although data science methods have been applied to large and complicated systems such as social networks, data science efforts in complex natural systems (with physical, chemical and biological elements) have been far more limited. MBDH will facilitate new insights into sectors of water, energy, food, agriculture, transportation and manufacturing.

Midwest states border the nation's largest freshwater reservoir and are dominant in agricultural production, transportation and distribution, ranking as the largest supplier of biofuel energy and the agricultural foundation of many local, regional and national economies and populations. Home to major urban centers with multiple modalities of transportation (including railroad and the heart of the automobile industry), the Midwest also includes major advanced and digital manufacturing concerns,

including for agricultural and transportation equipment and equipment for the food industry. By enabling unprecedented interdisciplinary scientific exchanges and collaborations among these five sectors, *SEEDCorn* will facilitate partnerships and activities that foster development of necessary analytical methods, big data algorithms, visualization tools, and sensory acquisition methods, as well as access to storage, scalable operational infrastructure, and data management systems.

As an example, food and water quality testing and environmental studies require large volumes of genomic and metagenomics data describing the composition of microbial populations in samples; while next generation sequencing platforms allow for taxonomic profiling, annotating and linking of genetic information, this must subsequently be mined and correlated with other data sources. Sequencing errors, incorrect annotations and translational mistakes complicate this process, which is further impeded by the scale of the data. A second example is that of efficiently deriving relationships between food availability, water quantity/quality, and energy; this requires integration of data typically available only within an individual sector (farmers' use data, Army Corps' report data, energy sector data) as well as sharing of data across regions (i.e., soybean disease spreading from South America into the Midwest via hurricanes).

The spokes of the MBDH will enable sectors and cross-sector partnerships to address distinct research and engineering challenges: (1) understanding the impact of oil fracking on water; (2) understanding cross-sector dependencies and effective sharing of data as related to climate modeling, sustainable and adaptive food systems, and changing climate under economic and demographic conditions; (3) sustainability and ecosystem management using precision agriculture enabled by high-resolution crop yield data; (4) autonomous vehicles and new automotive design and development enabled by ubiquitous sensing and analytics capabilities; (5) quality management, defect tracking and elimination, supply management and shop-floor visibility in manufacturing; (6) intelligent manufacturing, digital manufacturing, design innovation and cyber-physical manufacturing networks and infrastructure.

Healthcare & Biomedical Research (HBR) Spokes There is no sector in American society that is positioned for more dramatic change driven by Big Data than Healthcare and Biomedical Research. Topol [11] points out that the multiplicative effect of innovations of the cell phone, the personal computer, the Internet, numerous digital sensor devices, DNA sequencing and -omics technologies, and social networks has positioned medicine for a "great inflection" before the end of this decade. This transformation is being driven by data, information, and the empowerment and engagement of patients. It is positioning society to move from acute care and over-reliance on emergency room visits to a chronic disease management focus leading to a wellness, prevention, and health focus. It would be hard to imagine a set of more complex big data characteristics than exists in this spoke. Big data challenges in healthcare & biomedical research include: (1) data and information standardization, integration and aggregation of biological and clinical research measurements, patient reported information, and sensor-generated data; (2) data and information privacy and health IT (HIT) security, including policies and regulations; (3) best practices regarding data sharing and use of open-source Big Data analytic applications.

The HBR Spoke will convene a set of hybrid workshops (on-site and virtual), integrated biomedical workforce training programs powered by online learning and on-site opportunities, and community building activities to establish a defined set of sustainable public-private partnerships focused on addressing opportunities and challenges related to Big Data in HBR. The ***HBR Spoke*** will leverage the ***Data Sciences, Education***, and ***Data Tools and Services*** rings and will interact strongly with the ***Network Science*** and ***Business Analytics Spokes*** (leadership detailed in *Partnerlist*).

Annual workshops will be convened at all five MBDH PI sites that will be led by the HBR Spoke Team. These will be attended by a growing set of healthcare and biomedical research partners from academia (Universities of Michigan, Cincinnati, Chicago and the Open Cloud Consortium, Iowa, Illinois, Indiana, Ohio State and Northwestern; and their partners including the Mayo Clinic and NorthShore University Health System; others affiliating), pharmaceutical/biotech industry (Abbvie, Eli Lilly, Transgenomics, Assurex Health, others affiliating), private healthcare systems (Henry Ford, Trinity Health, Regenstrief

Institute); and non-profit foundations (tranSMART Foundation, Michael J. Fox Foundation, Open Cloud Consortium). An initial list of potential workshop topics includes:

- Data wrangling, scrubbing, and machine-learning methods to mine, analyze, visualize, and understand biomedical data (from -omics, health records, and mobile platforms) in a temporal fashion, capturing longitudinal trends to alert researchers of discovery opportunities, alert providers of intervention or adverse events, and to alert patients to provide positive feedback;
- Building new communities and partnerships to leverage global open biomedical science data sharing and analytics platforms such tranSMART, i2b2, and i2b2 SMART;
- Geospatial health informatics data analytics/visualization capabilities for HBR communities;
- Understanding how to work with patients in the home using biometric sensors cell phone applications and communications capabilities;
- Workforce development: a cohort of data science-enabled students and trainees at all levels (undergraduate through post-doctoral) to build and use emerging and future data platforms.

Rings Complementing and connecting the thematic *spokes*, we have created *rings* (Figure 1) to integrate spokes in advancing data science; creating and leveraging shared resources for data, tools, services; and as described in C.3 developing and sharing education and training resources and opportunities.

Data Sciences Ring Data science is an emerging field that represents the common core of motivating Big Data applications and includes the *data lifecycle* (data collection, structure, provenance management, curation and digital preservation), *methodologies* for processing and analyzing data (workflow planning, computation, databases, modeling, visualization), and *societal impacts* of big data (privacy and security, policy, ethics, usability). A challenge with data science is its rapid evolution through wide ranging applications, and a lack of integration of knowledge and experiences across these contexts. The Data Sciences ring will aggregate and coordinate expertise, helping to better define data science itself, and through the MBDH will bring this expertise specifically to the spokes, partners, and wider community, including the social and economic impact of data across all spokes. MBDH institutions are especially strong in theoretical, mathematical, statistical, and algorithmic aspects of data analytics; the underlying organization and curation of data; and deep consideration of privacy, confidentiality and benefits to society (with, e.g., extraordinary computer science, bio/statistics, information science departments, as well as top-tier programs that serve the federal statistical system and outreach in helping communities benefit from data). The MBDH and its partners will benefit from shared expertise and ongoing interactions that help define and expand core data science concepts for solving problems, proactively evaluate their impact on society, and educate the workforce in core data science concepts.

Through *SEEDCorn*, the ***Data Sciences Ring*** will work along several thrusts: (1) *community development*, organizing regular interactions and workshops (C.8) among ring and spoke participants to share ideas, opportunities, challenges, and best practices in data science broadly as well as in specific contexts that are meaningful to spokes; (2) *research*, responding to specific applications or common methodological problems arising across contexts, we will serve as a partnership resource for building inter-organizational research teams to develop novel approaches in data science and pursue sponsored funding to support these investigations; (3) *expertise,* providing access to individual/group knowledge on specific topics or services, such as the capacity to conduct audits needed for the Data Seal of Approval [12] to a repository; (4) *educational and workforce development*, developing and supporting educational, internship and hiring opportunities in data science for government, industry, nonprofits and academia.

While the ***Data Sciences Ring*** underpins how all spoke activities extract knowledge from data, it provides a foundation for activities of the ***Data Tools and Services Ring*** for implementation and linking of software and hardware that allow groups to store, retrieve, link, and analyze data.

Data Tools and Services Ring A key role of MBDH is to provide shared structures that support development of community data activities. This includes building on common existing cyberinfrastructure resources (C.4) to support: linking of existing or developing services and repositories,

in our region or nationally; creation of new services needed by our growing communities; development of pilot projects that may be undertaken by these communities.

Communities face several key data challenges: how are data to be stored, curated, described, shared, discovered, verified, interpreted and linked, across repositories, with traditional publications, and with richer environments where they may be computed upon for additional investigation? These challenges are not restricted to academic sectors but extend to non-profits, industry, and individuals within the region. A sophisticated set of services must be developed and made part of the culture of doing research; key challenges identified above relating to industrial and academic interests in the region require these services. Developing mechanisms for linking data repositories is particularly key for those activities that require participation or integration of multiple spokes or rings.

SEEDCorn is not funded to build such environments but will leverage independently funded resources and projects across MBDH, facilitating their integration and interoperation. In the Midwest, there are numerous data-related projects and resources (C.1, C.4), e.g. DIBBS, DataNet, Globus Online, OCC, NDS. Furthermore, the Research Data Alliance (RDA), rapidly emerging as the international organization through which protocols, best practices, and policies can achieve wide adoption, has strong ties within MBDH (e.g. Co-PI Plale). RDA will enable MBDH to gain wider adoption and acceptance for advances in interoperability, access, and curation.

We will actively support information sharing about individual tools and services between spokes and across hubs as well as developing social structures within which tools and services can be connected and developed. To support these (and other) goals, we will create a portal in our website to facilitate the sharing of information and expertise for all hub and spoke activities, including the regionally available tools and services. To support the social and technical aspects of tool sharing, the MBDH and the Western Hub (led by NDS partner UCSD) will jointly provide leadership in supporting this environment for all four regional hubs. *SEEDCorn* will leverage this activity, partially funding a support person to work with the interhub subcommittee on federated data service environments and hub projects to assist in the use of this environment for the MBDH and other hubs. A Data Services hackathon will be hosted in 2016 (C.8).

C.6. Governance

MBDH institutions and partners form a distributed hub that aggregates expertise, projects and resources from their members, enabling communities to assemble and function along distributed thematic spokes. MBDH has been built as a highly dynamic organization: Spokes are created as interest and opportunity evolves. Resources are expected to continually grow, and new opportunities along with them. The MBDH organization was formed as a shared collective, with institutions and partners working together and sharing leadership to make big data in the Midwest region as optimally successful as possible.

The organizational framework of MBDH is a hierarchical structure: At the lowest level of the hierarchy are diverse players engaging in thematic spoke activity around data collections, acquisition, management, etc. At the middle level are cross-spoke communication and cross-sector Big Data and sharing policy discussions as well as aligned educational interests and resources, tools and resources. At the top level the hub has a leadership structure consisting of a Steering Council and an Organizational Partners Board who work through an executive director (ED).

The cornerstone of the organization of MBDH is the Steering Council (SC) and the Organizational Partners Board (OPB). These bodies together provide vision, day-to-day oversight, representation by all stakeholders, and structure to enable cross-hub cooperation. The core organizational entities, their responsibilities and benefits, are described below. An interim SC is in existence. SC membership (see *Partnerlist*) is representative of all early stakeholders in the organization, with working groups around each existing spoke and ring, as well as for topics of education, industry, and diversity. The interim SC will give way to an elected SC by March 1, 2016.

Steering Council (SC) The SC consists of volunteer representatives from organizations who are actively involved in governance, with identified goals for the consortium. The initial membership will consist of

the ring and spoke leads, five at large members, and the PI team. At-large membership may be used for consideration of perspectives on big data from underrepresented groups. Decision-making is through by-laws developed by the SC in the first year of the project. The SC chair is an elected position, serving a one-year term with the possibility of a renewal year. The responsibilities of the SC are chosen to reflect foundational aspects that guide the structure of big data partnerships. These include but are not limited to: (1) set strategy and agenda for the Hub; (2) initiate formation of data and tool sharing policies as need emerges, and work through international bodies like Research Data Alliance (RDA) for broader impact; (3) monitor and evaluate the success of the Hub; (4) invite new members to serve on the OPB; (5) develop procedures and expectations for new partnerships, spokes, or rings; and (5) assess issues surrounding Hub sustainability. SC members are expected to serve as the initial points of contact for potential partners. They will leverage their knowledge of local industry, consortia, nonprofits, governmental agencies, and academic institutions to link existing and new partners with the Hub.

The SC will also hold discussions with the other bodies of governance on further aspects of partnerships, such as (1) public access to data and other products (including permission to publish); (2) expectations for financial support (cost/benefit); (3) educational component (training, outreach and extension); (5) broader impact; (6) ethics and responsible conduct of research; and (7) expectations for productivity (technology, publications, curricula, conferences, workshops, etc.).

Organizational Partners Board (OPB) The OPB is an organization of big data stakeholders (i.e., companies, non-profit organizations, and federal and state agencies) from the Midwest region. OPB members have active and ongoing relationships/partnerships with members of the Hub. Each OPB member institution has a single OPB seat. The roles of the OPB include developing use cases, providing data for research, representing their needs to drive Hub and Spoke strategies, and developing structures to increase the value of data sharing and Hub membership. The OPB nominates and appoints its own chair and develops its own by-laws. The OPB chair holds a seat on the SC.

Affiliated Partners Affiliated partners are individuals who represent non-members institutions from outside the region. Each affiliated partner fills a critical shortage within the region and has an active, short-term relationship with one or more members of the MBDH. Affiliated partners are approved by the SC and will contribute use cases, data sets, and big data resources. In return affiliated partners have limited access to Hub activities as appropriate to their relationship. For instance, an affiliated partner who participates through a Spoke, will have a received benefit derived from that Spoke.

MBDH Staff The executive director (ED) is a full-time paid position, which along with associated staff positions, implements the decisions of the SC and oversees day-to-day operations of the MBDH. Hub operations, however, are distributed; along with the full-time ED, fractionally funded staff working on different aspects of the consortium are at four other PI locations throughout the Midwest. The fractional project coordinator and technical support person report to the ED, who reports to the PI Seidel and SP Nahrstedt at Illinois but is accountable to the SC.

Spoke Governance Spokes are led by spoke leads. It is anticipated that individual spoke groups will require semi-autonomy (i.e. distributed authority; room to optimize terms to maximize value for different spokes). Spokes will develop partnerships and offer services as described above.

Ring Governance Rings are led by a ring lead. Rings will continually refine services that spokes can take up but will offer services of their own. In conjunction with other hubs, the ***Data Tools and Services Ring*** will offer an environment in which services that span all hubs may be developed.

C.7.   Goals and metrics

The metrics for evaluating our proposed framework for the Hub and partnerships will be based on growth and economic impact as well as benefits to society and local communities. These metrics will evolve with the Hub and its activities. Specific outcomes of *SEEDCorn* will be many, including:

Partnerships Strengthening and creation of numerous public-private partnerships, built on a stronger funding base, with new projects funded by multiple agencies, government organizations, and private industry as a result of workshops and other *SEEDCorn* events. Progress will be measured by number of public-private partnerships, with tracking of funding received, by number of members (growth, retention), and by the growth of shared data resources.

Joint activity Projects will not operate in isolation, but will be connected through MBDH. Progress will be measured by the increase in external funding for member organizations, funding with demonstrated links across MBDH members, and by the number of collaborative projects between members and joint publications.

Education and workforce development New educational activities (online lessons, events, curricula) and best practices will be gathered, organized, and delivered through our collaborative efforts. These efforts are measured by the uptake by different organizations within and outside the region and the U.S., graduate and undergraduate courses that include materials developed in MBDH, and individuals interested in retooling their expertise. Also tracked are events and attendance, with focus on outreach to underrepresented groups.

Pilot activity *SEEDCorn* will support pilots in a common technical data service environment through use of NDS Labs, leading to innovation, interlinking and acceleration of data services across potentially hundreds of projects. Progress will be measured by number of pilots and success acquiring funding.

Policies and sustainability New business models for sustainable data solutions will be developed and implemented, as will data policies and standards, including for IP.

Table 1: *SEEDCorn* planned milestone/events for MBDH.

Deliverables	Y1		Y2	Y3
	Fall	Spring		
Executive Director identified	X			
Elected Steering Council Operates		X		
Sustainability plan developed by Steering Council			X	
MBDH portal for educational and data service activities			X	
Events				
PI Team coordinating event Project all-hub kick-off workshop at Illinois	X			
PI Team coordinating event Project all-hub kick-off workshop at Illinois; Steering council meeting	X			
All Co-PIs attend NSF BD Hub meeting	X			
Data Spoke workshop on Tools/Services workshop at Illinois	X	X		
UND Big Data Summit	X	X	X	
Food, Water, Energy Workshop at Illinois		X		
Digital Ag workshop at Iowa State				
Industry workshop		X		
Data Science workshop at Iowa State		X		
Tools/services hackathon at Illinois		X		
All hub workshop		X	X	X
BD Hub Consortium Meeting		X	X	X
Workshop Development/Diversity workshop at Illinois			X	
Tools workshop at Illinois			X	
Energy workshop at Illinois			X	X
Healthcare & Biomedical Research and Life Science Big Data Workshop at University of Michigan		X		
Transportation Big Data Workshop at University of Michigan			X	
Business Analytics Big Data Workshop at University of Michigan Wayne State University		X		X

These metrics reflect our vision of the Hub as a facilitator of research/education/infrastructure by providing access to shared resources and information from partners about challenges and resources.

C.8. Timelines

We summarize in Table 1 the detailed planning of MBDH events and workshops to be supported by *SEEDCorn*, which is frontloaded so the majority of events are supported in the first year, with a goal of securing funding for subsequent years. A detailed sustainability plan is to be delivered by the SC in Y2.

C.9. Broader Impacts of the Proposed Work

We are particularly excited about the broader impact potential for *SEEDCorn*. The project builds on many partners who have come together to create the MBDH, an unusually large and diverse consortium of partners, far exceeding usual NSF grants. In addition to small colleges, large R1 private and state universities, and rural universities across the region, MBDH has dozens of additional organizations, including city and state governments, nonprofits, and companies, among its members. The consortium is built to create and sustain academic-industry-government partnerships, with reach into all sectors of the Midwest. The region is rich in diverse and underrepresented populations, including Hispanic, African-American, and Native American, who have much to gain by participating in the democratization of knowledge through data sharing. The project specifically includes an experienced diversity coordinator (SP Franklin) as an SC member, who will leverage existing and new relationships with national organizations to engage multiple sectors of society.

C.10. Results of Prior NSF Support

Edward Seidel, Brian Athey and Josh Riedy have not had project support from NSF within five years.

Sarah Nusser: SES0822002, $230,189, 10/2008-7/2012, Accommodating Individual Differences in Software Designed for Location-Based Survey Tasks. *Intellectual merit*: Developed a model that describes the variation for low and high spatial persons in how they use maps, work with map software, and perform location-based field tasks for census and survey applications. *Broader impacts*: Contributed to design principles for mobile interfaces for census and survey field work; supported two REU students, one HCI minority and one Computer Science graduate student, five talks and seven publications.

Beth Plale DataNet: Sustainable Environment Actionable Data (SEAD). (Co-PI: NSF ACI 0940824, $8,000,000, 9/27/2011-8/11/2014). SEAD is developing tools to reduce the curation barrier to active data curation and publishing for scientists in the long tail. *Intellectual Merit*: Advanced the understanding of long-tail science [Plale2012]. Prototyped active data curation and publishing services [Plale et al. 2013] that embed a model of minimal provenance in [Plale et al. MIT Press]. *Broader impacts*: SEAD publishes results through DataOne as a member node.

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(i) Professional Preparation

College of William and Mary - Williamsburg, VA Physics and Mathematics BS 1981
University of Pennsylvania - Philadelphia, PA   Physics   MS 1983
Yale University - New Haven, CT   Astrophysics   Ph.D. 1988

(ii) Appointments

2014-present Director, National Center for Supercomputing Applications (NCSA);
            Founder Professor of Physics, Professor of Astronomy, U. Illinois
2012-2014   Senior Vice-President for Research and Innovation and Professor,
            Skolkovo Institute of Science and Technology, Moscow, Russia
2009-2012   Assistant Director Mathematical and Physical Sciences, NSF
2008-2010   Director, Office of Cyberinfrastructure, National Science Foundation
2003-2008   Floating Point Systems Professor, Depts. of Physics and Computer
            Science, Louisiana State University, Baton Rouge, LA, USA
2003-2008   Director, Center for Computation and Technology (CCT), Louisiana
            State University, Baton Rouge, LA, USA
1996-2005   Professor (C3) Max Planck Institute for Gravitational Physics (Albert
            Einstein Institute), Potsdam, Germany
1994-1996   Senior Research Scientist, Head of Numerical Relativity Group, NCSA,
            University of Illinois
1991-1994   Research Scientist, Head of Numerical Relativity Group, NCSA,
            University of Illinois
1989-1991   Postdoctoral Research Associate, NCSA, University of Illinois
1987-1989   Postdoctoral Research Associate, Washington University

(iii) Products
Related to Current Proposal
- The Astrophysics Simulation Collaboratory Portal: a Framework for Effective
  Distributed Research, R. Bondarescu, G. Allen, G. Daues, I. Kelley, M. Russell, E.
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- Dynamical Evolution Of Quasi-circular Binary Black Hole Data, M. Alcubierre, B. Brugmann, P. Diener, F. S. Guzman, I. Hawke, S. Hawley, F. Herrmann, M. Koppitz, D. Pollney, E. Seidel, J. Thornburg, Phys.Rev. D72, 044004 (2005).
- Towards Standard Testbeds for Numerical Relativity, M. Alcubierre, G. Allen, C. Bona, D .Fiske, T. Goodale, F.S. Guzman, I. Hawke, S. Hawley, S. Husa, M. Koppitz, C. Lechner, D. Pollney, D. Rideout, M. Salgado, E. Schnetter, E. Seidel, H. Shinkai, D. Shoemaker, B. Szilagyi, R. Takahashi, and J. Winicour, Class. Quan. Grav., 21(2):589--613, gr-qc/0305023, (2004).
- Supporting Efficient Execution in Heterogeneous Distributed Computing Environments with Cactus and Globus, G. Allen, T. Dramlitsch, I. Foster, N. Karonis, M. Ripeanu, E. Seidel and B. Toonen, proceedings of SC2001 Conference, (2001). [Gordon Bell Prize]
- The Grazing Collision of Two Black Holes, M. Alcubierre, B. Brugmann, L. Nerger, E. Seidel, R. Takahashi, Phys. Rev. Lett. 87:271103,(2001)

(iv) Synergistic Activities

- Director of National Center for Supercomputing Applications housing world leading HPC and data systems and science application research teams
- Recipient of 2006 Sidney Fernbach Memorial Award, presented by IEEE Computer Society.
- Lead numerous large-scale relativity collaborations, including EU Astrophysics Network.
- Key author, Principal Investigator and Steering Committee member for the European GridLab project which has provided Grid Application Toolkit, GAT-API and GridSphere.

(v) Collaborators and Other Affiliations:
(a) Collaborators and Co-Editors: I. Foster (Chicago), B. Schutz (AEI). **Total: Two**
(b) Graduate and Postdoctoral Advisors: Prof. Vincent Moncrief, Yale University, Clifford Will, Washington University, Larry Smarr, UCSD. **Total: Three**
(c) Thesis Advisor/Postgraduate Scholar Sponsor:
K. Camarda,(1997) S. Brandt (1998), P. Walker (1998), Illinois; R. Takahashi (2001), G. Lanfermann (2003), T. Dramlitsch (2003), M. Koppitz (2004), F. Herrmann (2005) AEI, G. Allen, P. Anninos, J. Masso, J. Jaynes, Illinois; J. Thornburg, F. Guzman, I. Hawke, S. Hawley, D. Holz, P. Diener, D. Pollney, M. Campanelli, C. Lousto, J. Baker, N. Stergioulas, S. Brandt, J. Thonburg, T. Font, D. Rideout, L. Wild, P. Papudapoulos, Christian Ott (AEI). **Total: 30**
(d)Post-Graduate Sponsor: None

BIOGRAPHICAL SKETCH: Brian D. Athey

A. PROFESSIONAL PREPARATION

INSTITUTION	LOCATION	MAJOR / AREA OF STUDY	DEGREE (if applicable)	YEAR YYYY
St. John's College	Annapolis, MD	Major: Classical Studies	OTH	1977
University of Michigan	Dearborn, Michigan	Major: Biochemistry; Minors Physics and Mathematics	BS	1982
University of Michigan	Ann Arbor, Michigan	Cellular and Molecular Biology: Biophysics Concentration	PHD	1990
University of Michigan Medical School	Ann Arbor, Michigan	Developmental Biology Training Program	Postdoctoral Fellow	1990 - 1991
University of Michigan Medical School	Ann Arbor, Michigan	Chemical and Hearing Senses Training Program	Postdoctoral Fellow	1991 - 1993
St. Hugh's College, University of Oxford	Oxford, UK	CNS Anatomy Course	Postdoctoral Fellow	1998 - 1998

B. APPOINTMENTS

2015 -   Co-Director Designate, Michigan Institute for Data Science (MIDAS), University of Michigan

2012 -   Michael A. Savageau Collegiate Professor and Founding Chair, Department of Computational Medicine and Bioinformatics (DCM&B), University of Michigan Medical School (UMMS), Ann Arbor, MI

2008 -   Professor, Biophysics, Michigan Nanotechnology Institute for Medicine and Biological Sciences (M-NIBS), Department of Internal Medicine, UMMS

2008 -   Professor, Bioinformatics and Computational Biology, Bioinformatics Program, UMMS

2008 -   Professor, Biomedical Informatics, Departments of Psychiatry and Internal Medicine, UMMS

2007 -   Director, Biomedical Informatics Program (BIP), Michigan Institute for Clinical and Health Research (MICHR), UMMS

2005 -   Principal Investigator, NIH National Center for Integrative Biomedical Informatics, UMMS

2009 - 2011   Collegiate Professor and Chair, Department of Computational Medicine and Bioinformatics (DCM&B), UMMS

2009 - 2013   Associate Director, Michigan Institute for Clinical and Health Research (MICHR), UMMS

2009 - 2011   Director of Medical School Academic Informatics, UMMS

2009 - 2011   Professor and Chair, Computational Medicine and Bioinformatics Department, UMMS

2005 - 2008   Associate Professor, Bioinformatics and Computational Biology, Bioinformatics Graduate Program, Center for Computational Medicine and Bioinformatics (CCMB), UMMS

2005 - 2009   Associate Director, Center for Computational Medicine and Bioinformatics (CCMB), UMMS

2003 - 2005   Visiting Associate Professor, Optical Engineering and Computer Science (EECS), University of Michigan College of Engineering

2003 - 2008   Associate Professor, Biomedical Informatics, Department of Psychiatry and Comprehensive Depression Center, UMMS

2003 - 2008   Associate Professor, Biophysics, Michigan Nanotechnology Institute for Medicine and Biological Sciences, Department of Internal Medicine, Division of Allergy and Immunology, UMMS

C. PRODUCTS

Products Most Closely Related to the Proposed Project

1. **Athey, BD**., Cavalcoli, J., Jagadish HV, Omenn GS, Mirel B, Kretzler M, Burant C, Isopheki R, DeLisi C, the NCIBI faculty, trainees, and staff. 2011. The NIH National Center for Integrative

Biomedical Informatics (NCIBI). *J. Am. Med. Inform. Assoc.* 2012 March 1;19(2):166-170. PMID:22101971. PMCID: PMC327762

2. Bhavnani SK, Warden M, Zheng K, Hill M, **Athey BD**. Researchers' Needs for Resource Discovery and Collaboration Tools: A Qualitative Investigation of Translational Scientists. *Journal of Medical Internet Research*. 2012 June 5;14(3):e75. PMID:22668750. PMCID: PMC3415064

3. Sarntivijai S, Xiang Z, Shedden KA, Markel H, Omenn GS, **Athey BD**, He Y. Ontology-based Combinatorial Comparative Analysis of Adverse Events Associated with Killed and Live Influenza Vaccines. *PLOS One*. 2012:7(11):e49941. PMID:23209624. PMCID: PMC3509157

4. **Athey BD**, Braxenthaler M, Haas M, Guo Y. tranSMART: An Open Source and Community-Driven Informatics and Data Sharing Platform for Clinical and Translational Research. *AMIA Jt. Summits Transl. Sci. Proc*. 2013 March 18;2013:6-8. eCollection 2013. PMID:24303286. PMCID: PMC3814495

5. Duren W, Weymouth T, Hull T, Omenn GS, **Athey B**, Burant C, Karnovsky A. MetDisease - connecting metabolites to diseases via literature. *Bioinformatics*. 2014 April 23. PMID:24713438.

D. SYNERGYSTIC ACTIVITIES

1. Founding co-director of the Michigan Institute for Data Science (MIDAS): University of Michigan wide effort to build a cohesive faculty, launch four Big Data Challenge Initiatives (Healthcare, Transportation, Social Science, and Learning Analytics), includes an education and training program, and industry outreach program. MIDAS will actively engage in all MBDH activities, and will play a leadership role in the Healthcare, Transportation and Business Analytics Spoke activities.

2. Founding Chair of the Department of Computational Medicine and Bioinformatics at UM Medical School, and PI of the NIGMS T32 UM Bioinformatics Training Program, beginning its 9th year. DCMB is active in the integrative Omics space, and proteomics as applied to Cancers and more generally.

3. PI, NIH NCBC National Center for Integrative Biomedical Informatics (NCIBI), program ended 2011). Transitioned NCIBI bioinformatics tools and data assets to tranSMART Foundation (see tranSMARTFoundation.org), a gobal open science code and data sharing community. I serve as its Chief Science Officer (CSO). tranSMART Foundation will be active in the Healthcare BD Spoke.

E. COLLABORATORS & OTHER AFFILIATIONS

(i) Collaborators and Co-Editors During the Past Four Years - TOTAL = 27

- **tranSMART Foundation**: Jay Bergeron, Michael Braxenthaler, Sherry Cao, Keith Elliston, Ashley George, Yike Guo, Rudy Potenzone, Kevin Smith

- **University of Michigan**: Alex Ade, Chuck Burant, Ivo Dinov, Matthias Kretzler, Vasu Mahavisho, Gilbert Omenn, Kevin Smith, Terry Weymouth, John Wiley, Zach Wright

- **AssureRx Health, Inc**.: Tony Altar, Jim Burns, Bryan Dechairo, Gina Drosos, Gerry Higgins, Don Lucas, Don Wright

- **FDA**: Darrell Abernethy, Sira Sarntivijai

(ii) Investigator's Graduate and Postdoctoral Advisors - TOTAL = 0
None

(iii) Thesis Advisor and Postgraduate-Scholar Sponsor- TOTAL = 6
- S. Sarntivijai (Ph.D., Bioinformatics; Athey B.D., Chair)
- G. Su (Ph.D., Bioinformatics; Athey B.D., Co-Chair with Fan Meng)
- A. Shah (Ph.D., Bioinformatics; Athey B.D., Co-Chair with Peter Wolfe)
- A. Allyn-Feuer 2011 - (Ph.D. Candidate; B.D. Athey, Chair)
- Edward Barbour (Ph.D. Candidate; B.D. Athey, Chair)
- A. Kalinin (Bioinformatics; with Ivo Dinov)

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Biosketch
Sarah M. Nusser

</div>

Office of the Vice President for Research	Phone: (515) 294-1785
2610 Beardshear Hall	E-mail: nusser@iastate.edu
Iowa State University	
Ames, Iowa 50011-2036	

A. Professional Preparation

University of Wisconsin, Madison, WI	Botany	BS	1980
North Carolina State University, Raleigh, NC	Botany	MS	1983
Iowa State University, Ames, IA	Statistics	MS	1987
Iowa State University, Ames, IA	Statistics	PhD	1990

B. Appointments

2014-	Vice President for Research, Iowa State University
2003-	Professor, Department of Statistics, Iowa State University
2003-	Faculty Member, Human Computer Interaction Graduate Program, Iowa State University
1994-	Faculty Member, Ecology & Evolutionary Biology Graduate Program, Iowa State University
2012 (2 wks)	Summer at Census Research Fellow, US Census Bureau
2011 (Fall)	Mathematical Statistician, National Agricultural Statistics Service
2007-2010	Director, Center for Survey Statistics & Methodology
2000-2001	ASA/NSF/BLS Senior Research Fellow, Bureau of Labor Statistics
1992-2004	Director, Center for Survey Statistics & Methodology
1997-2003	Associate Professor, Department of Statistics, Iowa State University
1992-1997	Assistant Professor, Department of Statistics, Iowa State University
1990-1992	Statistician, The Procter & Gamble Company, Cincinnati, OH

C. Publications

Welk, G.J., Y. Kim, B. Stanfill, D.A. Osthus, M. Calabro, S. Nusser, and A. Carriquiry. 2014. Validity of 24 hour physical activity recall: Physical Activity Measurement Survey. *Medicine and Science in Sports and Exercise*. (in press, http://www.ncbi.nlm.nih.gov/pubmed/24561818)

Batinov, G., K. Whitney, L. Miller, S. Nusser, B. Stanfill, and K. T. Ashenfelter. 2013. Evaluating the impact of spatial ability in virtual and real world environments. *Sixth International Conference on Advances in Computer-Human Interactions* (ACHI 2013). Nice, France. February 24 – February 24-28, 2013. p. 274-279.

Nusser, S. M., Beyler, N. K., Fuller, W. A., Carrqiuiry, A. L., Welk, G. W., King, B. M. N. 2012. Modeling errors in physical activity recall data. *Journal of Physical Activity and Health*, 9(Supp 1):S56-S67.

Karl, J. W., M. C. Duniway, S. M. Nusser, J. D. Opsomer, R. S. Unnasch. 2012. Using very-large scale aerial (VLSA) imagery for rangeland monitoring and assessment: some statistical considerations. *Rangeland Ecology and Management*. (in press) doi: http://dx.doi.org/10.2111/REM-D-11-00102.1

Nusser, S. M. and C. House. 2009. Sampling, data collection and inference in agricultural surveys. In *Handbook of Statistics: Modern Sample Surveys, Volume 1: Design, Methods and Applications*, D. Pfefferman (editor). Elsevier. Pp. 471-486.

D. Synergistic Activities

***Research Advancement*:** The Office of the Vice President for Research has responsibility for advancing the research mission at Iowa State University (ISU), and particularly focuses on interdisciplinary research opportunities that involve scholars from multiple disciplines and colleges. As part of this mission, I have established the Data Driven Science Initiative (DDSI) at ISU, which involves participation from all colleges and the VPs for extension and outreach and for economic development and business engagement. DDSI program components include a seed and team development program for data driven

science, education (data science as a field, certificate and minor programs, continuing education), engagement (integration of research and education with external projects), research community development, and computational infrastructure for big data.

National Resources Inventory (**NRI**)**:** For over 20 years, I led the on-going cooperative work done with the U.S. Department of Agriculture (USDA) Natural Resources Conversation Service to develop and implement statistical and survey methods for the National Resources Inventory. Research collaborations involved scientists from USDA (NRCS, NASS, ARS) and BLM. My research focused on developing mobile handheld and desktop survey software for GIS-based survey protocols for capturing geographic features; sample design field and remote sensing studies; and survey error evaluation.

*National Agricultural Statistics Service***:** I led a research team to redesign spatial sampling for a NASS area survey, including development of a geospatial survey instrument to support interviews with farmers. Other research involves area frame development using spatial data and estimators that integrate remote sensing, administrative and survey data.

*Professional Service***:** National Academies committees and panels, Census Bureau Advisory Committee, Food and Agriculture Organization Scientific Advisory Committee for Global Strategy to Improve Agricultural and Rural Statistics, several American Statistical Association (ASA) service activities, including ASA Council of Sections Governing Board Chair.

Honors: Fellow, ASA; Elected Member, International Statistical Institute; Distinguished Achievement Award, ASA Section on Statistics and the Environment; Regents Faculty Excellence Award, ISU.

E. Collaborators and Other Affiliations
Collaborators and Co-Editors, past 48 months
Breidt, F. J., Colorado State University; Carriquiry, A. L., Iowa State University; Flanagan, P., Natural Resources Conservation Service (NRCS), USDA; Fuller, W. A., ISU; Herrick, J. Agricultural Research Service (ARS), USDA; Karl, J. ARS, USDA; Kim, J-K., ISU; Lessard, V., NRCS, USDA; Matthews, C., National Cancer Institute; Miller, L. L., ISU; Opsomer, J. D., Colorado State University; Sucik, M., NRCS, USDA; Turk, J., NRCS, USDA; Welk, G., ISU; Young, L., National Agricultural Statistics Service, USDA; Yu, C. L., ISU; Zhu, Z., ISU.

Graduate Advisors and Postdoctoral Sponsors
Nusser's Thesis Advisor: Koehler, K. J., PhD Advisor, Iowa State University

Thesis Advisor and Postgraduate-Scholar Sponsors, past 5 years
Alf, C., Nielson; Arroway, P., North Carolina State U.; Berg, E., ISU (research faculty); Beyler, N., Mathematica Policy Institute; Botts, C., Williams College; Drignei, D., National Center for Atmospheric Research; Ferraz, C., Universidad Federal de Pernambuco, Brazil; Huang, L., unknown; Kies-Bokenkroger, C., MRI Research; Legg, J., Amgen; Leonard, K., private industry; Pan, J., Yahoo; Perrit, K., private industry; Qu, L., University of Alabama; Riddles, M., Westat; Rusch, M., University of Iowa (HCI); Schaller, S., private industry; Shierholz, H., U. Toronto; Zhao, P., George Mason University; Zheng, Z., unknown; Zimmer, S., RTI.

Number of collaborators and co-editors: 17
Number of graduate advisors and postdoctoral sponsors: 1
Number of graduate students advised: 22
Number of post-doctoral scholars sponsored: 1

Beth A. Plale
Professor of Informatics and Computing
Science Director, Pervasive Technology Institute
Director, Data To Insight Center
Indiana University Bloomington
plale@indiana.edu

Professional Preparation

University of Southern Mississippi	Hattiesburg, MS	Computer Science	B.S. 1984
University of Laverne	LaVerne, CA	Business Administration	MBA 1986
Temple University	Philadelphia, PA	Computer and Information Science	M.S. 1992
State University of New York	Binghamton, NY	Computer Science	Ph.D. 1998
Georgia Institute of Technology	Atlanta, GA	Experimental Computer Systems	1999 - 2001

Appointments

2014 -	Science Director, Pervasive Technology Institute, Indiana University
2014 -	Affiliated Faculty, Ostrom Workshop on Political Theory and Policy Analysis
2011-	Professor, School of Informatics and Computing, Indiana University Bloomington
2011-	Managing Director, Pervasive Technology Institute, Indiana University
2009-	Director, Data To Insight Center
2007-2009	Assoc Dean of Research, School of Informatics and Computing
2006-	Director, School of Informatics Center for Data and Search Informatics
2006-2011	Assoc Professor, School of Informatics and Computing, Indiana University Bloomington
2001-2006	Asst Professor, School of Informatics and Computing, Indiana University Bloomington
Fall 2003	Visiting Scientist, University of Edinburgh, Scotland UK
2000, 2001	Instructor, Undergraduate Advanced Operating Systems, Georgia Institute of Technology
1996-1997	Grad Research Asst, Georgia Institute of Technology
1994-1995	Adjunct Faculty, Programming language courses, Perimeter College, Atlanta, Georgia
1991-1993	Grad Research Asst, Instructor, Grad Teaching Asst: State Univ of New York Binghamton
1989-1990	Grad Teaching Asst, Temple University
1986-1989	Lead Software Engineer, GTE Federal Systems, Westlake Village, CA
1984-1985	Programmer, Vitro Corporation, Oxnard, CA

Products

1. J. Zeng and B. Plale (2015). Workload-Aware Resource Reservation for Multi-Tenant NoSQL, *2015 IEEE Int'l Conf on Cluster Computing*, Chicago IL Sep 2015
2. J. Zeng and B. Plale (2014). Multi-tenant Fair Share in No-SQL Data Stores, *2014 IEEE Int'l Conf on Cluster Computing*, pp. 176-184, DOI 10.1109/CLUSTER.2014.6968761
3. J. Zeng, G. Ruan, A. Crowell, A. Prakash, B. Plale (2014). Cloud Computing Data Capsules for Non-consumptive Use of Texts, *5th Workshop on Scientific Cloud Computing, with ACM High Performance Distributed Computing (HPDC),* pp. 9-16. DOI 10.1145/2608029.2608031
4. P. Chen, B. Plale, M. Aktas (2014). Temporal Representation for Mining Scientific Data Provenance, *Future Generation of Computer Systems*, Elsevier, (36) pp. 363-378
5. J. Zeng and B. Plale (2013). Data pipeline in MapReduce, *9th IEEE Int'l Conf on e-Science,* pp. 164-171, DOI 10.1109/eScience.2013.21

Other Significant Products
1. B. Plale, K. Brewster, C. Mattocks, A. Bhangale, E. C. Withana, C. Herath, F. Terkhorn, and K. Chandrasekar. Dataset: Weather Forecast Data from the D2I-Vortex2 project. May 1 to Jun 15, 2010. Bloomington, Indiana: Data to Insight Center.
2. M. Aktas, B. Plale, D. Leake, N. K. Mukhi (2013). Unmanaged Workflows: Their Provenance and Use, *Data Provenance and Data Management for eScience, Studies in Computational Intelligence series, Springer,* (426), pp. 59-81.
3. E.C. Withana, B. Plale (2010). Usage Patterns to Provision for Scientific Experimentation in Clouds, *2nd IEEE Int'l Conf Cloud Computing Technology and Science*
4. B. Plale, K. Schwan (2003). Dynamic Querying of Streaming Data with the dQUOB System, *IEEE Trans. on Parallel and Distributed System*, (14) 3
5. B. Plale, D. Gannon, Y. Huang, G. Kandaswamy, S.L. Pallickara, and A. Slominski (2005). Cooperating Services for Managing Data Driven Computational Experimentation, *IEEE Computing in Science and Engineering*, IEEE Press, (7) 5, pp. 24-33

Synergistic Activities
- *Enabling digital humanities research:* HathiTrust Research Center founder and co-Director, 2011 - present
- *Advancing international data sharing:* Research Data Alliance/US Executive Steering Committee; Research Data Alliance Technical Advisory Board Co-chair (TAB) 2013-present
- *Advancing underrepresentation in STEM:* Founding Advisory Board, Center of Excellence for Women in IT (CEWIT); IU Women in Science Board Member (2010-2012); founder, Women In Computing @ IU (2001 – 2007)

Collaborators & Other Affiliations (20)

Peter Arzberger (SDSC, NSF)	Craig Mattocks (Miami U)
Fran Berman (RPI)	Jim Myers (UMichigan)
Reed Beaman (UFlorida, NSF)	Mark Parsons (RPI)
Geoffrey Brown (Indiana U)	Sandy Payette (U Michigan)
J. Stephen Downie (UIUC)	Atul Prakash (U Michigan)
Jose Fortes (U Florida)	Lavanya Ramakrishnan (LBNL)
Geoffrey Fox (Indiana U)	Matei Ripeanu (UBC Canada)
Margaret Hedstrom (U Michigan)	Beth Namachchivaya Sandore (UIUC)
Praveen Kumar (UIUC)	John Unsworth (Brandeis University)
Bertram Ludaescher (UIUC)	Ann Zimmerman (U Michigan)

Graduate Advisors and Postdoctoral Sponsors (2)
Sudhir Aggarwal (Florida State), PhD co-Chair
Karsten Schwan (Georgia Institute of Technology), PhD co-Chair and Postdoc Advisor

Thesis Advisor and Postgraduate Scholar Sponsor (15):

Mehmet Aktas, Yildiz Technical University, Turkey	Inna Kouper, Indiana University
Bin Cao, Teradata	Ying Liu, Cisco
Abhriup Chakraborty, Teradata Aster	Sangmi Lee Pallickara, Colorado State University
You-Wei Cheah, Lawrence Berkeley Nat'l Labs	Lavanya Ramakrishnan, Lawrence Berkeley Nat'l Labs
Miao Chen, Indiana University	Yogesh Simmhan, India Institute of Science Bangalore
Devarshi Ghoshal, Lawrence Berkeley Nat'l Labs	Nithya Vijayakumar, Apple
Chathura Herath, Knight Capital Group	Eran Chinthaka Withana, Workday
Scott Jensen, San Jose State University	

Joshua M. Riedy

Education

SDSU, Brookings, SD	Agricultural Education	B.S.	1997
SDSU, Brookings, SD	Career and Technical Education	M.Ed.	2000
USD, Vermillion, SD	Education Administration	Ed.D.	2007

Professional Employment

2013-pres. Vice Provost and Chief Strategy Officer (CSO), UND
2012-2013 Associate Chief Information Officer, NDUS
             Director of Systems Information Technology Services, NDUS
2011-2012 Special Assistant to the Chancellor, NDUS
2008-pres. Chief Information Officer, UND
2007-2011 Associate Vice President for Outreach Services & Dean of Outreach Programs, UND

Products

None

Synergistic Activities

1. Devised a plan that centrally hosts significantly enhanced high performance computing resources in the form of a "Collaborative Center for Computation and Data" intended to serve the State including all North Dakota universities and companies choosing to participate. The corresponding proposal was unanimously approved by the State Board of Higher Education in late 2014.

2. Responsible for design and construction of a new office building and tier 3 datacenter ($17.5M) on the University of North Dakota campus including reallocation of $5M of internal funding to pair with a corresponding legislative appropriation.

3. Oversaw implementation of the Northern Tier Network on the University of North Dakota Campus. The Northern Tier Network—North Dakota (NTN-ND) is a joint network effort between the State Information Technology Department (ITD), North Dakota State University (NDSU) and the University of North Dakota (UND) to connect North Dakota to the nation's research and education network.

4. Named to the "Top 40 Under 40" members of the region's business community under the age of 40 list in 2012 by the Prairie Business Magazine.

Current Collaborators

Ed Seidel, PI	UIUC	Department of Physics
Brian Athey, Co-PI	UMich	Department of Computational Medicine and Bioinformatics

Sarah Nusser, Co-PI	ISU	Vice President for Research
Beth Plale, Co-PI	IU	Department of Computer Science
Klara Nahrstedt, Co-PIU	IUC	Department of Computer Science
Jennifer Clarke	UNL	Department of Statistics
Greg Monaco	KSU	Department of Psychology

Total: 7

Graduate and Post-graduate Advisors

| R.L. Erion | South Dakota State University | M.Ed., Career and Technical Education |
| Mark Baron | University of South Dakota | Ed.D., Education Administration |

Total: 2

Graduate Student Advisees in the Last 5 Years (current affiliation)

None   Total no. graduate students supervised: 0

Postdoctoral Fellows Sponsored in the Last 5 Years (current affiliation)

None   Total no. postdoctoral fellows supervised: 0

Prof Gabrielle Allen

(i) Professional Preparation

Nottingham University, Nottingham, UK	Mathematics	BSc 1988
Cambridge University, Cambridge, UK	Applied Math and Theoretical Physics	MAst 1989
Cardiff University, Cardiff, UK	Physics	PhD 1993
Cardiff University, Cardiff, UK	SERC Postdoctoral Fellowship	1993–1995
Max Planck Inst. for Gravitational Physics, Potsdam, Germany	Postdoctoral Researcher	1995-1998

(ii) Appointments

2014-present	Professor, Department of Astronomy, UIUC
2014-present	Associate Director, NCSA, UIUC
2012-2014	Professor and Acting CIO, Skolkovo Institute of Science & Technology, Moscow
2012-present	Adjunct Faculty, Center for Computation & Technology, LSU
2012-present	Adjunct Professor, Department of Computer Science, LSU
2012-2012	Professor, Department of Computer Science, LSU
2003-2012	Associate Professor, Department of Computer Science, LSU
2003-2011	Assistant Director, Center for Computation & Technology, LSU
2003-2012	Adjunct Professor, Department of Physics, Louisiana State University
2003-2005	Senior Scientist, Max Planck Institute for Gravitational Physics (Albert Einstein Institute), Potsdam Germany
2002-2003	Lead of Computational Science Group, Max Planck Institute for Gravitational Physics (Albert Einstein Institute), Potsdam Germany
1998-2002	Cactus Project Leader, Max Planck Institute for Gravitational Physics, (Albert Einstein Instiute), Potsdam, Germany

(iii) Products

Related to Current Proposal

- *The Einstein Toolkit: A Community Computational Infrastructure for Relativistic Astrophysics*, F. Loeffler, J. Faber, E. Bentivegna, T. Bode, P. Diener, R. Haas, I. Hinder, B. C. Mundim, C. D. Ott, E. Schnetter, G. Allen, M. Campanelli and P. Laguna. Classical and Quantum Gravity, 29(11):115001, 2012, doi:10.1088/0264-9381/29/11/115001

- *The Cactus Code: A Problem Solving Environment for the Grid*, G. Allen, W. Benger, T. Goodale, H. Hege, G. Lanfermann, A. Merzky, T. Radke, E. Seidel and J. Shalf, in Proceedings of Ninth IEEE International Symposium on High Performance Distributed Computing, HPDC-9, August 1-4 2000, Pittsburgh, IEEE Press, pp 253-260, (2000).

- *Summary of the First Workshop on Sustainable Software for Science: Practice, Experiences (WSSSPE1),* Katz, D. S., Choi, S.-C. T., Lapp, H., Maheshwari, K., Loeffler, F., Turk, M., Hanwell, M. D., Wilkins-Diehr, N., Hetherington, J., Howison, J., Swenson, S., Allen, G. D., Elster, A. C., Berriman, B., Venters, C., Journal of Open Research Software, 2(1), 2014.

- *Large Scale Problem Solving Using Automatic Code Generation and Distributed Visualization*, A. Hutanu, E. Schnetter, W. Benger, E. Bentivegna, A. Clary, P. Diener, J. Ge, R. Kooima, O. Korobkin, K. Liu, F. Loeffler, R. Paruchuri, J. Tao, C. Toole, A. Yates, G. Allen, Scalable Computing: Practice and Experience 11 (2), (2010)

- *The Cactus Framework and Toolkit: Design and Applications*, T. Goodale, G. Allen, G. Lanfermann, J. Masso, T. Radke, E. Seidel and J. Shalf, Vector and Parallel Processing - VECPAR'2002, Lecture Notes in Computer Science, Springer, (2003).

Other Significant Products

- *Integrating Web 2.0 technologies with scientific simulation codes for real-time collaboration.* G. Allen, F. Löffler, T. Radke, E. Schnetter, and E. Seidel. CLUSTER, page 1-10. IEEE Computer Society, (2009)
- *The Astrophysics Simulation Collaboratory Portal: A Framework for Effective Distributed Research,* R. Bondarescu, G. Allen, G. Daues, I. Kelley, M. Russell, E. Seidel, J. Shalf and M. Tobias, Future Generation Computer Systems, Volume 21, Issue 2, Pages 259-270, (2005)
- *Towards standard testbeds for numerical relativity,* M. Alcubierre, G. Allen, C. Bona, D. Fiske, T. Goodale, F.S. Guzman, I. Hawke, S. Hawley, S. Husa, M. Koppitz, C. Lechner, D. Pollney, D. Rideout, M. Salgado, E. Schnetter, E. Seidel, H. Shinkai, D. Shoemaker, B. Szilagyi, R. Takahashi, J. Winicour, Class. Quantum Grav., 21(2), p. 589-613, (2004).
- *Supporting Efficient Execution in Heterogeneous Distributed Computing Environments with Cactus and Globus*, G. Allen, T. Dramlitsch, I. Foster, N. Karonis, M. Ripeanu, E. Seidel and B. Toonen, proceedings of SC2001 Conference, (2001). [Gordon Bell Prize]
- *The Cactus Worm: Experiments with Dynamic Resource Discovery and Allocation in a Grid Environment*, G. Allen, D. Angulo, I. Foster, G. Lanfermann, C. Liu, T. Radke, E. Seidel, J. Shalf, International Journal of High Performance Computing Applications, **15(4)**, (2001).

(iv) Synergistic Activities

- Since 2014 Associate Director of the National Center for Supercomputing Applications responsible for Computational Research and Education Programs.
- Since 2013 Organizer of the first three Workshops for Sustainable Software for Science and Engineering (WSSSPE1/2013, WSSSPE2/2014, WSSSPE3/2015)
- Since 1997, lead of the Cactus Software effort creating community framework for HPC
- Winner of IEEE SCALE (2009), Gordon Bell Prize (2001) and HPC/Bandwidth Challenge (2002)
- Since 2015 Associate Editor for SoftwareX (New journal published by Elsevier for peer reviewed software publications)

(v) Collaborators and Other Affiliations

(a) Collaborators and Co-Editors: Eloisa Bentivegna (Independent), B. Berriman (Caltech), Tanja Bode (Tuebingen), Manuela Campanelli (RIT), Sou-Cheng. T. Choi (U. Chicago/IIT), Peter Diener (LSU), Anne C. Elster (NTNU), Joshua Faber (RIT), Roland Haas (AEI), Marcus D. Hanwell (Kitware), Michael Heroux (Sandia Nat Lab), James Hetherington (UCL), Ian Hinder (AEI), James Howison (UT Austin), Daniel S. Katz (U. Chicago/NSF), Pablo Laguna (Georgia Tech), Hilmar Lapp (NESCent), Frank Löffler (LSU), Ketan Maheshwari (ANL), Bruno Mundim (AEI), Christian D. Ott (Caltech), Manish Parashar (Rutgers), Erik Schnetter (Perimeter), Shel Swenson (USC), Matthew Turk (UIUC), Colin Venters (U. Leeds), Nancy Wilkins-Diehr (UCSD). Total: 27

(b) Graduate and Postdoctoral Advisors: Prof B. F. Schutz (AEI), Prof E. Seidel (LSU). Total: 2

(c) Thesis Advisor/Postgraduate Scholar Sponsor: Andrei Hutanu (Google), Lei Jiang (Tapjoy), Archit Kulshrestha (Cycle Computing), Jian Tao (LSU), Frank Loeffler (LSU), David Rideout (SDSC). Total: 6

BIOSKETCH

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University of Minnesota   Email: rbapna@umn.edu
Minneapolis, MN 55410

PROFESSIONAL PREPARATION

University of Connecticut, Storrs	Operations and Information Management	Ph.D., 1999
University of Mangalore, India	Computers Engineering	B. Tech., 1993
St. Xaviers College, Calcutta	Commerce	B. Com., 1989

APPOINTMENTS   (Academic/Professional)

May 12, 2011 - present	*Board of Overseers Endowed Professor of Information and Decision Sciences*, Carlson School of Management, University of Minnesota
August 1, 2012 - present	*Director*, Social Media and Business Analytics Collaborative (SOBACO), University of Minnesota
2010- May 11, 2011	*Board of Overseers Endowed Associate Professor of Information and Decision Sciences*, Carlson School of Management, University of Minnesota
2006 – present	*Execituve Director*, Srini Raju Centre for IT and the Networked Economy, Indian School of Business, Hyderabad, India
Jan 2011 - present	*Senior Editor,* MIS Quarterly
2006-2010	*Associate Editor*, MIS Quarterly
2010- present	*Vice President,* INFORMS-Information Systems Society
2010-2013	*Elected Member of Faculty Consultative Committee,* Carlson School of Management, University of Minnesota
2006-2008	*Tenured Associate Professor of Information Systems*, Indian School of Business, Hyderabad, India
2004-2006	*Tenured Associate Professor and Ackerman Scholar*, Operations and Information Management, University of Connecticut
2001-2004	*Assistant Professor*, Operations and Information Management, University of Connecticut
2000-2001	*Assistant Professor,* Northeastern University, Boston
1999-2000	*Assistant Professor,* University of Texas at Dallas

PUBLICATIONS

Up to five most closely related publications:

1. Bapna, R. and J. Ramaprasad, G. Shmueli, A. Umyarov., 2013, "One-Way Mirrors in Online Dating: A Randomized Field Experiment," WISE Conference, Orlando.
2. Bapna, R., Gupta, A., Sundararajan, A., Rice, S., 2012, "Trust, Reciprocity and the Strength of Friendship Ties: Experiments on an Online Social Network," *National Bureau of Economic Research*, available at http://www.nber.org/confer/2011/SI2011/PRIT/Bapna.pdf
3. Bapna, R., Umyarov, A, 2012, "Are Paid Subscriptions on Music Social Networks Contagious? A Randomized Field Experiment," *National Bureau of Economic Research*, available at http://users.nber.org/~confer/2012/SI2012/PRIT/Bapna_Umyarov.pdf
4. Bapna, R., Langer, A., Mehra, A., Gopal, R., Gupta, A., "Examining Return on Human Capital Investments in the Context of Offshore IT Workers," forthcoming in *Management Science.*

5. Bapna, R., Dellarocas, C., Rice, S., "Vertically Differentiated Simultaneous Vickrey Auctions: Theory and Experimental Evidence," *Management Science*, July 2010; **56**: pp 1074 - 1092

Up to five other significant publications:

1. Bapna, R., Goes, P., Gupta, A., "Pricing and Allocation for Quality Differentiated Online Services," *Management Science,* 51:7, 1141-1150, July 200
2. Bapna, R., Goes, P., Gupta, A., Jin. Y., "User Heterogeneity and its Impact on Electronic Auction Market Design: An Empirical Exploration," *MIS Quarterly*, 28:1, pp. 21-43, March 2004.
3. Bapna, R., Barua, A., Mani, D., Mehra, A., "Cooperation, Coordination and Governance in Multi-Sourcing: An Agenda for Analytical and Empirical Research," *Information Systems Research* (20th Anniversary Special Issue) 2010, 21, pp 785-795.
4. Bapna, R., Das. S., Day, R., Garfinkel. R., Stallaert, J., "A Clock-and-Offer Auction Market for Grid Resources when Bidders Face Stochastic Computational Needs," forthcoming in the *Informs Journal on Computing 2011*
5. Bapna, R., Goes, P., Wei, K. K., Zhang, Z., "A Finite Mixture Logit Model to Segment and Predict Electronic Payments System Adoption," *Information Systems Research* 2010. March 2011; 22: pp. 118 – 133.

SYNERGISTIC ACTIVITIES

Director, The Identity Initiative, founded an inter- disciplinary research center at the Indian School of Business, examining the socio-economic impact of India's population wide unique identity initiative.
Founding Director, The CIO Academy, estabilished a research and education forum at the Indian School of Business targeted for helping CIOs achieve operational exclellnce and strategic innovation.
Co-chair (along with Indranil Bardhan and Alok Gupta) *Workshop on Information Systems and Economics* (WISE) – 2010, St. Louis
Co-chair (along with Anindya Ghose and Kevin Zhu) *Conference on Information Systems and Technology* (CIST) – 2009, San Diego INFORMS Annual meeting.
Co-founded (with Galit Shmueli and Wolfgang Jank) the Statistical Challenges in E-Commerce Research (SCECR) workshop, which is now in its seventh year.

COLLABORATORS & OTHER AFFILIATIONS (since 2007)
Collaborators and Co-editors (including graduate students):

Barua, A. (UT-Austin), Chang, S. (SUNY-Albany), Das, S. (Buffalo), Day, R., (Connecitcut), Dellarocas, C. (Boston Univ.), Garfinkel, R. (Connecitcut), Gupta, A., (Minnesota), Mani, D., (Indian School of Business), Mehra, A. (Indian School of Business), Rice, S. (Connecitcut), Wei, K (Citu U of Hong Kong), Zhang, Z, (Connecitcut). (Total: 12)

GRADUATE & POSTDOCTORAL ADVISORS

Gupta, A. (Minnesota); Goes, P. (University of Arizona). (Total: two)

THESIS ADVISOR & POST GRADUATE-SCHOLAR SPONSOR (within last five years)
Chang, S. (SUNY-Albany), Das, S. (Buffalo), Sanyal, P. (George Mason), Harpreet Singh (UT-Dallas)

Total number of PhD students advised is four.

Maxine D. Brown

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Professional Preparation

Temple University	Mathematics	BA, 1972
University of Pennsylvania	Computer Science	MSE, 1976

Academic/Professional Appointments

2014-present	Director, EVL, UIC
1986-2013	Associate Director, EVL, UIC
1995-1997	Associate Director, Marketing Communications, NCSA
1983-1986	Professional and technical communications consulting
1982-1983	Documentation Director, Digital Productions, Los Angeles, CA
1979-1982	Public Relations and Technical Writing, ISSCO, San Diego, CA
1976-1979	Engineer, Hewlett-Packard, Cupertino, CA

Related Products

[1] A. Febretti, A. Nishimoto, T. Thigpen, J. Talandis, L. Long, J.D. Pirtle, T. Peterka, A. Verlo, M. Brown, D. Plepys, D. Sandin, L. Renambot, A. Johnson, J. Leigh, "CAVE2: A Hybrid Reality Environment for Immersive Simulation and Information Analysis," IS&T/SPIE Electronic Imaging, International Society for Optics and Photonics, Volume 8649, 2013, pp. 864903

[2] T. DeFanti, D. Acevedo, R. Ainsworth, M.D. Brown, S. Cutchin, G. Dawe, K. Doerr, A.E. Johnson, C. Knox, R. Kooima, F. Kuester, J. Leigh, L. Long, P. Otto, V. Petrovic, K. Ponto, A. Prudhomme, R. Rao, L. Renambot, D. Sandin, J. Schulze, L. Smarr, M. Srinivasan, P. Weber, G. Wickham, "The Future of the CAVE," Central European Journal of Engineering, 1(1), 2011, pp.16-37.

[3] Joe Mambretti, Tom DeFanti, Maxine D. Brown, "StarLight: Next-Generation Communication Services, Exchanges, and Global Facilities," Advances in Computers, (editor: Marvin Zelkowitz), Vol. 80, Burlington: Academic Press, 2010, pp. 191-207.

[4] T.A. DeFanti, J. Leigh, L. Renambot, B. Jeong, A. Verlo, L. Long, M. Brown, D.J. Sandin, V. Vishwanath, Q. Liu, M.J. Katz, P. Papadopoulos, J.P. Keefe, G.R. Hidley, G.L. Dawe, I. Kaufman, B. Glogowski, K-U. Doerr, R. Singh, J. Girado, J. Schulze, F. Kuester, L. Smarr, "The OptIPortal, a scalable visualization, storage, and computing interface device for the OptiPuter," Future Generation Computer Systems, Volume 25, Issue 2, February 2009, pp. 114-123

[5] J. Leigh and M.D. Brown, "Cyber-Commons: Merging Real and Virtual Worlds," Communications of the ACM, Volume 51, Issue 1, January 2008, pp. 82-85.

Other Significant Products

[1] G. Pieper, J. Leigh, L. Renambot, A. Verlo, L. Long, M. Brown, D. Sandin, V. Vishwanath, R. Kooima, J. Girado, B. Jeong, T. DeFanti, Q. Liu, M. Katz, P. Papadopoulos, J. Keefe, G. Hidley, G. Dawe, I. Kaufman, B. Glogowski, K. Doerr, et al, SciDAC Review, Issue 12, Spring 2009, IOP Publishing in association with Argonne National Laboratory, Office of Science, pp. 32-41

[2] Larry Smarr, Maxine Brown, Cees de Laat (guest editors), Special issue "OptIPlanet - The OptIPuter global collaboratory," Future Generation Computer Systems, 25(2), 2009, pp. 109-197.

[3] J. Leigh, L. Renambot, A. Johnson, B. Jeong, R. Jagodic, N. Schwarz, D. Svistula, R. Singh, J. Aguilera, X. Wang, V. Vishwanath, B. Lopez, D.J. Sandin, T. Peterka, J. Girado, R. Kooima, J. Ge, L. Long, A. Verlo, T.A. DeFanti, M. Brown, D. Cox, R. Patterson, P. Dorn, P. Wefel, S. Levy, J. Talandis, J. Reitzer, T. Prudhomme, T. Coffin, B. Davis, P. Wielinga, B. Stolk, G.B. Koo, J.Y. Kim, S.W. Han, J.W. Kim, B. Corrie, T. Zimmerman, P. Boulanger, M. Garcia, "The Global Lambda Visualization Facility: An International Ultra-High-Definition Wide-Area Visualization Collabora-

tory," Future Generation Computer Systems, Vol. 22, Issue 8, Elsevier, Oct. 2006, pp. 964-971.

[4] Larry Smarr, Maxine Brown, Tom DeFanti and Cees de Laat (guest editors), Special issue on iGrid 2005: The Global Lambda Integrated Facility, Future Generation Computer Systems, Volume 22, Issue 8, Elsevier, October 2006, pp. 849-1054.

[5] Maxine Brown (guest editor), "Introduction: Blueprint for the Future of High-Performance Networking," Communications of the ACM, Volume 46, Issue 11, November 2003, pp. 30-33.

Synergistic Activities

- *Committees:* Co-chair, IEEE Visualization 2015, Chicago, October 25-30, 2015; Member, Advanced Computing Innovation Partnership (ACIP), organized by NCSA, 2014-present; President Elect (2009-10), President (2010-11), Past President (2011-12) and Member, Board of Directors, Great Lakes Consortium for Petascale Computing, 2009-present; Member, External Advisory Committee, Argonne Leadership Computing Facility, 2008-2009; Co-chair, Global Lambda Integrated Facility (GLIF) Research & App Working Group (2005-present); Member, PRAGMA (Pacific Rim Applications and Grid Middleware Assembly), 2002-present.

- *Award Recognitions:* Global Visionary, Chicago NPR/PBS multimedia series "Chicago Matters: Beyond Burnham," for being a "co-creator and coordinator of the largest digital hub in North America" – StarLight; Recipient, UIC Merit Award 2001; Recipient, ACM SIGGRAPH 1998 Outstanding Service Award; Recipient, UIC Chancellor's Academic Professional Excellence (CAPE) Award, 1990.

- *Organizer/ Project Manager:* Co-chair, GLIF 12th Annual LambdaGrid Workshop, 2012, Chicago; Organizer, iGrid 2005 (San Diego), iGrid 2002 (Amsterdam, The Netherlands), iGrid 2000 (held at INET 2000, Yokohama, Japan), iGrid '98 (held at SC'98, Orlando, FL); Organizer, Research Demonstrations, Alliance 98, sponsored by NCSA (February 1998); Member, Information Architecture Committee, IEEE/ACM Supercomputing 95, San Diego, and organizer of I-WAY's GII Testbed research demonstrations (1995); Organizer and host, Visualization Theater, IEEE/ACM Supercomputing 88-91 conferences (1988-91).

- *Professional Organization Activities:* Officer, ACM SIGGRAPH organization: Vice Chair for Operations (1985-87) and Secretary (1981-85); Member, ACM SIGGRAPH conferences: Conference Planning Committee (1989-1994), VROOM co-chair (1994), Conference chair (1992), Electronic Theater chair (1984), Exhibits co-chair (1979), Local Arrangements co-chair (1977), speaker, panel participant, tutorial organizer, etc. (1977-94).

- *Journal Special Issues − Guest Editor:* (OptIPuter), Future Generation Computer Systems, 25(2), Elsevier, February 2009; (iGrid 2005), Future Generation Computer Systems, 22(9), Elsevier, Oct. 2006, pp. 849-1054; (Next Generation Networking), Communications of the ACM, November 2003; (iGrid 2002), Future Generation Computer Systems, 19(6), Elsevier, August 2003; (Blueprint for High Performance Computing), assisted guest editor Larry Smarr with Communications of the ACM, Vol. 40, No. 11, November 1997; (VR Over High-Speed Networks), IEEE Computer Graphics & Applications, July 1996, 16(4).

Collaborators: 26

Faculty, staff and students at UIC; D. Acevedo (KAUST); R. Ainsworth (retired); J. Bottom (Clemson); S. Cutchin (Boise State); Greg Dawe (UCSD); C. de Laat (Univ. of Amsterdam); T. DeFanti (UCSD); Kai Doerr (HIPerWorks/UCSD); Jules Jaffe (SIO); Chris Knox (unknown); Robert Kooima (LSU); Falko Kuester (UCSD); Jason Leigh (UHM); J. Mambretti (Northwestern); M.A. Manzoul (JSU); Truong Nguyen (UCSD); M. Papka (ANL); T. Peterka (ANL); P. Otto (UCSD); K. Ponto (Wisconsin); R. Rao (UCSD); T. Rosing (UCSD); J. Schulze (UCSD); L. Smarr (UCSD); G. Wickham (KAUST); Sudha Yerramilli (JSU)

Graduate and Post Doctoral Advisors: Stephen Smoliar (retired).

Thesis Advisor and Postgraduate-Scholar Sponsor: None.

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Professional Preparation

Oxford University, Oxford, UK and Stanford University, Stanford, CA	B.A	History	1984
Stanford University Law School, Stanford, CA	J.D.	Law	1987

Appointments

Indiana University, Bloomington, IN
      Director, Center for Law, Ethics and Applied Research in Health Information
      Director, Center for Applied Cybersecurity Research (2003-2014)
      Distinguished Professor, Maurer School of Law (2003 to present)
      C. Ben Dutton Professor of Law, Maurer School of Law (2008 to present)
      Adjunct Professor, School of Informatics and Computing (2005 to present)
Center for Information Policy Leadership at Hunton & Williams LLP, Washington, DC, Senior
      Policy Advisor (2001 to present)
The Annenberg Washington Program in Communications Policy Studies, Washington, DC.
      Senior Fellow (1990-96); Director of Research and Projects (1991-93).
Debevoise & Plimpton, Washington, DC. Associate (1987-1990)

Major Relevant Publications

Fred H. Cate, "Big Data, Consent, and the Future of Data Protection," in Hamid Ekbia, Cassidy
      Sugimoto & Michael Mattioli, eds., *Big Data* (MIT Press, forthcoming 2015).
Fred H. Cate, "Protecting Privacy in Big Data," *Journal of Law and Economic Regulation*
      (forthcoming 2015).
Fred H. Cate, "The Big Data Debate," *Science*, vol. 246, no. 6211, at 818 (Nov. 14, 2014).
Patricia Kosseim, Edward S Dove, Carman Baggaley, Eric M Meslin, **Fred H Cate**, Jane
      Kaye, Jennifer R Harris, and Bartha M Knoppers, "Data-Sharing Models for Global
      Genomic Research: Lessons from the Commercial Context," *Genome Biology* 15:430
      (2014) (with P. Kosseim, E.S. Dove, C. Baggaley, E.M. Meslin, J. Kaye, J. Harris &
      B.M. Knoppers).
Fred H. Cate, "Protecting Privacy in Health Research: The Limits of Individual Choice," 98
      California Law Review 1765 (2011).

Other Significant Publications

Fred H. Cate, *The Role of Risk Management in Data Protection*, Centre for Information Policy
      Leadership (2014).
Fred H. Cate, Peter Cullen and Viktor Mayer-Schönberger*, Data Protection for the 21st
      Century World*, Microsoft Corporation (2014)
Christopher Kuner, **Fred H. Cate**, Christopher Millard and Dan Jerker B. Svantesson, "The
      Challenge of Big Data for Data Protection," *International Data Privacy Law*, vol. 2, no. 2
      at 47 (2012)

Fred H. Cate & Beth E. Cate, "The Supreme Court and Information Privacy," *International Data Privacy Law*, vol. 2, no. 4 at 255 (2012).

Fred H. Cate, *Privacy in the Information Age* (Brookings Institution Press, 1997). Selected for the 35th annual Choice Outstanding Academic Books list by the Association of College and Research Libraries (1998). Second Printing (1998). Translated into Arabic and republished (2002).

Synergistic Activities

Organizing Committee Chair, National Academy of Sciences Workshop on Privacy for the Intelligence Community: Emerging Technologies, Academic and Industry Research, and Best Practices (2015 to present).

Inaugural member of the Forum on Cyber Resilience, National Academy of Sciences, Washington, DC (2014 to present).

Editor, *International Data Privacy Law*, Oxford University Press (2010 to present).

Member of the Board of Governors, The Kinsey Institute for Research in Sex, Gender and Reproduction, Bloomington, IN (2009 to present).

Congressional testimony: Senate Committees on Banking, Housing, and Urban Affairs; Commerce, Science, and Transportation; Intelligence; and Judiciary (Subcom. on Crime and Drugs); and House Committees on Banking and Financial Services (Subcom. on Financial Institutions and Consumer Credit); Energy and Commerce (Subcom. on Commerce, Trade, and Consumer Protection); Government Reform (Subcom. on National Security, Homeland Defense, and Foreign Operations; Subcom. on Government Management, Information and Technology); Homeland Security; Judiciary (Subcom. on Constitution, Civil Rights, and Civil Liberties Subcom. on Courts and Intellectual Property); and Ways and Means (Subcom. on Social Security).

Graduate Students and Other Affiliations

Collaborators and Co-editors (12 total): C. Baggaley, P. Cullen, E.S. Dove, J. Harris, P. Kosseim, J. Kaye, B.M. Knoppers, C. Kuner, V. Mayer-Schönberger, E.M. Meslin, C. Millard, D. Svantesson

Graduate Students Supervised (6 total): Zhizheng Wang, S.J.D., expected 2015; Muge Fazlioglu, Ph.D. Law and Social Science, expected 2015; Matthew Kerchner, S.J.D., 2007; Matt Jackson, Ph.D., Telecommunications, 1995; Vincenz Boedeker, LL.M., 1994; Thiti Kumnerddee, LL.M., 1993

Graduate Student Committees (10 total): Bill Hornaday, Ph.D., Journalism, 2013; Chris Soghoian, Ph.D., Informatics and Computer Science, 2012; Scott Shackelford, Ph.D., Political and International Studies, Cambridge, 2011; Michael Kapellas, Ph.D., Journalism, 2007; Greg Newton, Ph.D., Telecommunications, 2001; Joe Hinshaw, Ph.D., Telecommunications, 1995; Mark Shuler, Ph.D., Telecommunications, 1995; Cynthia App, Ph.D., Telecommunications, 1995; Lindsay Pack, Ph.D., Telecommunications, 1994; Yu-li Liu, Ph.D., Telecommunications, 1992

BIOGRAPHICAL SKETCH
Charles Edward Catlett
University of Chicago

Professional Preparation

University of Illinois, Urbana-Champaign Computer Engineering B.S. 1983

Appointments

2011 – present   Director, Urban Center for Computation and Data, University of Chicago
2010 – present   Senior Computer Scientist, Argonne National Laboratory
2007 – 2010   Chief Information Officer; Director, Computing and Information Services Division, Argonne National Laboratory
2004 – 2007   Director, NSF TeraGrid Project, Argonne National Laboratory
1999 – present   Senior Fellow, Computation Institute, University of Chicago
1999 – 2001   Visiting Scientist, Department of Computer Science, and Visiting Scholar, National Center for Supercomputing Applications (NCSA), University of Illinois at Urbana-Champaign (UIUC)
1999 – 2005   Executive Director, NSF TeraGrid Project, Argonne National Laboratory
1999 – 2004   Founding Chair, Global Grid Forum, Argonne National Laboratory Director, I-WIRE Project, Argonne National Laboratory
1996 – 1999   Chief Technology Officer, Senior Assoc. Director for Science and Technology, NCSA, University of Illinois at Urbana-Champaign
1992 – 1996   Associate Director, Computing and Communications, NCSA, UIUC
1987 – 1992   Manager, Networking, Storage and Systems Development, NCSA, UIUC
1985 – 1987   Senior Research Programmer; NSFNET backbone network team, UIUC

Products

Products Most Closely Related to Proposed Project
1. Catlett C, Eder D, Goldstein B, Giuffrida J. 2014. Plenar.io, http://plenar.io
2. Beckman P, Cattlett C, Pancoast D, Sankaran R. 2014. Array of Things, http://arrayofthings.github.io

Other Significant Products
1. Liming L, Navarro JP, Blau E, Brechin J, Catlett C, Dahan M, Diehl D, Dooley R, Dwyer M, Ericson K, Foster I, Hanna E, Hart DL, Jordan C, Light R, Martin S, McGee J, Pearlman L, Reilly J, Scavo T, Shapiro M, Smallen S, Smith W, Wilkins-Diehr N. 2009. TeraGrid's Integrated Information Service. ACM Proceedings of the 5th Grid Computing Environments Workshop. DOI: 10.1145/1658260.1658271
2. Catlett C, Altunay M, Armstrong R, Bailey K, Burleson RB, Crawford M, Daly J, Dixon D, Endicott-Popovsky B, Foster I, Frincke D, Gaines I, Goldfarb J, Griffin C, Jiao Y, Kolda T, Minnich R, Pancerella C, Petravick D, Ramming JC, Scherrer C, Schur A, Siebenlist F, Skow D, Stone A, Strasburg C, Strelitz R, Sumikawa D, Swietlik C, Talbot E, Thompson T, Vanderveen K, Welch V, Wendelberger JR, Whitney P, Wilder L, Worley B. 2008. A Scientific Research and Development Approach to Cyber Security. A report prepared for the Department of Energy.
3. Catlett C, Allcock WE, Andrews P, Aydt R, Bair R, Balac N, Banister B, Barker T, Bartelt M, Beckman P, Berman F, Bertoline G, Blatecky A, Boisseau J, Bottum J, Brunett S, Bunn J, Butler M, Carver D, Cobb J, Cockerill T, Couvares PF, Dahan M, Diehl D, Dunning T, Foster I, Gather K, Gannon D, Goasguen S, Grobe M, Hart D, Heinzel M, Hempel C, Huntoon W, Insley J, Jordan C, Judson I, Kamrath A, Karonis N, Kesselman C, Kovatch P, Lane L, Lathrop S, Levine M, Lifka D, Liming L, Livny M, Loft R, Marcusiu D, Marsteller J, Martin S, McCaulay S, McGee J, McGinnis L, McRobbie M, Messina P, Moor R, Moore R, Navarro JP, Nichols J, Papka ME, Pennington R, Pike G, Pool J, Reddy R, Reed D, Rimovsky T, Roberts E, Roskies R, Sanielevici S, Scott JR, Shankar A, Sheddon M, Showerman M, Simmel D, Singer A, Skow D, Smallen S, Smith W, Song C, Stevens R, Stewart C, Stock R, Stone N, Towns J, Urban T, Vildbill M, Walker E, Welch V,

Wilkins-Diehr N, Williams R, Winkler L, Zhao L, Zimmerman A. 2007. TeraGrid: Analysis of Organization, System Architecture, and Middleware Enabling New Types of Applications. Advances in Parallel Computing series, IOS Press, Amsterdam, 16:225-249.
4. Catlett C. 2005. TeraGrid: Foundation for U.S. Cyberinfrastructure. *Network and Parallel Computing, IFIP International Conference, NPC 2005,* Beijing, China, November 30 – December 3, 2005, Proceedings. H. Jin, D. A. Reed, W. Jiang (Eds.). Springer.
5. Reed DA, Giles RC, Catlett CE. 1997. Distributed Data and Immersive Collaboration. *Communications of the ACM* 40(11):38-48.

Synergistic Activities
Creating Opportunities for Students, Women, and Minority Serving Institutions
• *Expanded NSF's TeraGrid program to establish national student and minority serving institution partnership programs*.
Facilitating Inter-Institutional, International, and Industrial Collaboration
• *Founded NSF SBE-Funded Urban Sciences Research Coordination Network (FY13-15)*
• *Developed multi-institutional collaborative and governance structures for TeraGrid* ongoing operation and expansion, a $48M (2004) with nine major partners (www.teragrid.org).
• *Regular Participation and Leadership in institutional reviews and advisory teams.*
  - Computing Community Consortium's Network Science and Engineering (NetSE) Council, developed research agenda for NSF's Global Environment for Network Initiatives (GENI).
  - King Abdulla University of Science and Engineering (KAUST) Information Technology Advisory Team.
  - Board of Visitors (2009-), Texas Advanced Computing Center.
  - Qatar Foundation Blue Ribbon Panel on Computing, April 2011.
  - Chaired review committees for organizations including Lawrence Berkeley Laboratory's IT operations, KAUST HPC Plan review, Energy Sciences Network.
Working with State and City Government and Local Organizations
• *Regular Participation and Leadership in Governance reviews and advisory teams.*
  - Member, *Governor's Advisory Task Force on Internet Security and Privacy*.
  - Member, Chicago *Mayor's Council of Technical Advisors (past)*
  - Visiting Artist, member *Advisory Design Council*, Board of Advisors, *Earl and Brenda Shapiro Center*, School of the Art Institute of Chicago.
  - Judge, 2010 *Lumity Awards* information technology innovation contest for Chicago not-for-profit organizations serving underrepresented populations.

Collaborators & Other Affiliations
Collaborators and Co-Editors
Beckman, P. (ANL), Bettencourt, L. (SFI), Brown, D. (LLNL), Cagney, K. (UChicago), Diez, T. (UCL), Eriksson, J. (UIC), Fernando, J. (UND), Fitz, M. (LANL), Gilbert, J. (UChicago), Gilliam, M. (UChicago), Goerge, R. (UChicago), Goldstein, B. (UChicago), Gonzalez, M. (MIT), Graham, R., (UChicago), Grandinetti, L. (U Calabria), Guo, D. (NWU), Guzowski, L. (ANL), Jacob, R. (ANL), Lindau, S. (UChicago), Lobo, J. (ASU), Meltzer, D. (UChicago), Negri, C. (ANL), Niyogi, D. (Purdue), Ozik, J. (UChicago), Pancoast, D. (SAIC), Papka, M. (NIU), Peisert, S. (UC-Davis/LBNL), Potosnak, M. (DePaul), Ren, S. (IIT), Rodda, W. (SAIC), Rosner, R. (UChicago), Sallee, J. (UChicago), Sampson, R. (Harvard), Seto, K. (Yale), Small, M. (Harvard), Stevens, R. (ANL), Strelitz, R. (LANL), Trien, J. (ORNL), Welch, V. (UIUC), Work, D. (UIUC).
Total Number of Collaborators and Co-Editors: 40
Graduate Advisors and Postdoctoral Sponsors
Total Number of Graduate Advisors: 0; Total Number of Postdoctoral Sponsors: 0
Thesis Advisor and Postgraduate-Scholar Sponsor
Raj Sankaran, Argonne National Laboratory
Total Number Graduate Students Advised: 0;
Total Number of Postgraduate-Scholar Sponsor: 1

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(A) Professional Preparation

Mangalore University, Mangalore, India	Mechanical Engineering	B.S., 1988
Texas Tech University, Lubbock, Texas	Industrial Engineering	M.S., 1990
Texas Tech University, Lubbock, Texas	Industrial Engineering	Ph.D., 1994

(B) Appointments

WAYNE STATE UNIVERSITY, Industrial & Systems Engineering Department
8/2013-Current: Director, Big Data & Business Analytics Group
8/2012-Current: Professor
1/2008-Current: Founding Director, Global Executive Engineering PhD Program
8/2003-Current: Director, Graduate Programs
8/2000-8/2012: Associate Professor
NORTH DAKOTA STATE UNIVERSITY, Industrial & Manufacturing Engineering Department
8/1994-8/2000: Assistant Professor

(C) Publications

Five Selected Publications Most Relevant to the Proposed Project
1. Azadian, F., Murat, A.E., and Chinnam, R.B, "Integrated Production and Logistics Planning: Contract Manufacturing and Choice of Air/Surface Transportation," To Appear in *European Journal of Operations Research*. Accepted in May 2015.
2. Qiu, S., Chinnam, R.B., Murat, A., Batarse, B., Neemuchwala, H., and Jordan, W., "A Cost Sensitive Inpatient Bed Reservation Approach to Reduce Emergency Department Boarding Times," *Health Care Management Science*, Vol. 18, Issue 1, pp. 67-85, 2015.
3. Taghavi, A. and Chinnam, R.B., "Assortment Planning of Automotive Products: Considerations for Economic and Environmental Impacts of Technology Selection," *Journal of Cleaner Production*, Vol. 70, pp. 132-144, May 2014.
4. Zhou, C., Chinnam, R.B., and Korostelev, A., "Hazard Rate Models for Early Detection of Reliability Problems Using Information from Warranty Databases and Upstream Supply Chain," *International Journal of Production Economics*, Vol. 139, pp. 180-195, September 2012.
5. Nepal, B., Murat, E.A., and Chinnam, R.B., "Bullwhip Effect in Capacitated Supply Chains with Consideration for Product Life-cycle Aspects," *International Journal of Production Economics*, Vol. 136, No. 2, pp. 318–331, April 2012.

Five Other Significant Publications
6. Movahednejad, M., Mashayekhy, L., Chinnam, R.B, and Phillips, A., "Hierarchical Time-Dependent Shortest Path Algorithms for Vehicle Routing under ITS," To Appear in *IIE Transactions*. Accepted in June 2015.
7. Vanteddu, G. and Chinnam, R.B., "Supply Chain Focus Dependent Sensitivity of the Point of Product Differentiation," *International Journal of Production Research*, Vol 52, pp. 4984-5001, 2014.
8. Subramoniam, R., Huisingh, D., Chinnam, R.B., and Subramoniam, S., "Remanufacturing Decision Making Framework (RDMF): Research Validation using the Analytical Hierarchical Process," *Journal of Cleaner Production*, Vol. 40, pp. 212-220, February 2013.
9. Azadian, F., Murat, A.E., and Chinnam, R.B., "Dynamic Routing of Time-Sensitive Air Cargo using Real-Time Information," *Transportation Research Part E: Logistics and Transportation Review*, Vol. 48, No. 1, pp. 355-372, January 2012.

10. Guner, A., Murat, A.E., and Chinnam, R.B., "Dynamic Routing under Recurrent and Non-Recurrent Congestion Using Real-time ITS Information," *Computers & Operations Research*, Vol. 39, No. 2, pp. 358–373, February 2012.

(D) Synergistic Activities

- **Director, Big Data & Business Analytics Group**: The Wayne State University Group is the leading such center in Southeast-Michigan. It promotes big-data and analytics research, education, and industry-academic collaboration. It organizes annual symposia on Big Data & Business Analytics mostly targeting the business community. They attract over 200 participants, mostly from industry, with participation from leading big data vendors. For more information, visit the group website: http://bigdata.wayne.edu

- **Director, NSF PASI on Manufacturing Innovation through Sustainable Design**: The workshop was held at Universidad Del Norte in Barranquilla, Colombia for two weeks and brought together 12 lecturers from Colombia, Panama, Ecuador, Chile, and the United States together with 28 graduate and post-doctoral students, and junior faculty from the United States and Latin America. Funded by NSF and DOE (Award # 1242268).

- **Director, Global Executive Engineering PhD Program**: Founding director for the first such program in the U.S. in Engineering. By 2015, over 40 students have been admitted into the program at Wayne State University from such international companies/agencies as Ford, Chrysler, GM, General Dynamics, TRW, American Axle, QSS, Henry Ford Health Care, HUD, and VA. Both the curriculum and its delivery are novel. See program website for more information: http://engineering.wayne.edu/ise/get.

- **Industry Consulting Experience:** Extensive experience in analytics consulting, including work with such companies/organizations as Chrysler, Ford, Sirius Satellite Radio, General Dynamics Land Systems, Energy Conversion Devices, Dominos, CapGemini, Faurecia, Whirlpool, Steelcase, MRF Tyres, Urban Science, dFOUNDRY, MTS Technologies, and DataFactZ.

- **Editorial Positions:** North-American Editor: *Journal of Remanufacturing*, Associate Editor: *International Journal of Modeling and Simulation*, and *International Journal of Quality, Statistics, and Reliability*.

(E) Collaborators & Other Affiliations

- **Collaborators (30)**: F. Azadian (Embry Riddle Aeronautical U.), B. Batarse (Detroit VAMC), D. Cao (BP), E. Dalkiran (Wayne State U.), I. Dogan (Erciyes U., Turkey), D. Filev (Ford), D. Grosu (Wayne State U.), A. Guner (Zirve U., Turkey), K. Haapala (Oregon State U.), M. Houston (Wayne State U.), D. Huisingh (U. of Tenn), W. Jordan (VA CASE), G. Kramer (Penn State U.), K.Y. Kim (Wayne State U.), A. Korostelev (Wayne State U.), L. Mashayekhy (Wayne State U.), L. Monplaisir (Wayne State U.), A. Murat (Wayne State U.), X. Nan (Tongji U., China), H. Neemuchwala (VA CASE), B. Nepal (Texas A&M U.), J. Ockers (Alder Engineering Solutions), T. Phillips (Ford), T. Somers (Wayne State U.), R. Subramoniam (FTI Consulting), A. Taghavi (Llamasoft), M.K. Tiwari (IIT Kharagpur, India), G. Vanteddu (Southeast Missouri State U.), G. Wang (Caribbean Cruise Line), and C. Zhou (Faurecia).

- **Graduate Advisor (1)**: W. J. Kolarik (Oklahoma State U.)

- **Graduate Advisees (33)**: F. Camci (PhD, Antalya International U., Turkey), M. El-Banna (PhD, German Jordanian U., Jordan), R. Govindu (PhD, U. South Florida), P. Baruah (PhD, Avaya), G. Vanteddu (PhD, Southeast Missouri State U.), I. Dogan (PhD, Erciyes U., Turkey), A. Guner (PhD, Zirve U., Qatar), A. Kumar (PhD, IIT Kharagpur, India), D. Cao (PhD, BP), C. Zhou (PhD, Faurecia), J. Zughyer (PhD, GM), H. Ucar (PhD, Zirve U., Turkey), A. Timalsina (PhD, Tribhuvan U., Nepal), F. Azadian (PhD, Embry Riddle Aeronautical U.), R. Subramoniam (PhD, FTI Consulting), A. Taghavi (PhD, Llamasoft), E. Isikli (PhD, Istanbul Technical U., Turkey), D. Williams (PhD, General Dynamics), R.I. Campbell (PhD, Takata), Ed. Umpfenbach (PhD, DoD), S. Alaniazar (PhD, Ford), N. Philippart (PhD, BELLE Michigan), S. Qiu (PhD, Ford), and 10 MS graduates.

JENNIFER L. CLARKE
Computational Sciences Initiative, Department of Food Science and Technology, Department of Statistics
University of Nebraska-Lincoln
Phone: (402) 472-2512/jclarke3@unl.edu

Professional Preparation

Institution	Major/Area of Study	Degree	Year
Skidmore College, Saratoga Springs, NY	Mathematics/Psychology	B.A./B.A.	1993
Carnegie Mellon University, Pittsburgh, PA	Statistics	M.S.	1995
The Pennsylvania State University, State College, PA	Statistics	Ph.D.	2000

Appointments

2013-present	Director, Computational Sciences Initiative, University of Nebraska-Lincoln
2013-present	Associate Professor, Department of Statistics, University of Nebraska-Lincoln
2013-present	Associate Professor, Department of Food Science and Technology, University of Nebraska-Lincoln
2009-2013	Assistant Professor, Division of Statistical Theory and Methods, Department of Medicine, and Department of Psychiatry and Behavioral Medicine, University of Miami
2007-2012	Assistant Professor, Division of Biostatistics, Department of Epidemiology and Public Health, University of Miami
2005-2007	Assistant Research Professor, Department of Statistical Sciences, Duke University
2004-2007	Assistant Research Professor, Department of Biostatistics and Bioinformatics, Duke Uni.
2004-2007	Senior Scientist, Institute for Genome Sciences and Policy, Duke University
2001-2004	Visiting Assistant Professor, Department of Statistical Sciences, Duke University
2000-2001	Research Fellow, National Institute of Statistical Sciences, Research Triangle Park

Products (neé Pittman)

Five products closely related to the project

1. Clarke, B., Valdes, C., Dobra, A., and **Clarke, J.** A Bayesian testing approach to metagenomic profiling in bacteria, Statistics and Its Interface, 8 (2): 173-185, 2015**.**
2. Clarke, B., **Clarke, J.,** and Yu, C.-W. Statistical problem classes and their links to information theory. Econometric Reviews (Special Issue on Bayesian Inference and Information Theoretic Methods: In Memory of Arnold Zellner), 33 (1): 337-371, 2014**.**
3. **Clarke, J.**, Clarke, B. and Yu, C.-W. Prediction in M-complete problems with limited sample size. Bayesian Analysis, 8(3): 647-690, 2013.
4. Clarke, B. and **Clarke, J**., Prediction in several conventional contexts. Statistics Surveys, 6, 1-73, April 2012. DOI 10.1214/12-SS100
5. **Clarke, J.** and Clarke, B. Prequential analysis of complex data with adaptive combined average predictors. Statistical Analysis and Data Mining, 2:274-290, 2009

Five other significant products

1. **Clarke, J.,** and Clarke, B. Deconvolution of gene expression from mixed samples. STAT, 3 (1), 313-325, 2014**.**
2. **Clarke, J.,** Seo, P., and Clarke, B. Statistical expression deconvolution from mixed tissue samples. *Bioinformatics*, 26:1043-1049, 2010.
3. **Clarke, J**., and Seo, D., An ensemble approach to improved prediction from multitype data, In: IMS Collections, Vol 3: Festscrift in Honor of Professor J. K. Ghosh, B Clarke and S Ghosal, Eds., Institute of Mathematical Statistics, 302-317, 2008

4. Lin, X., **Pittman, J***.,* and Clarke, B. Bayesian effective samples and parameter size**.** IEEE Transactions on Information Theory, 53, 4438-4456, 2007.
5. **Pittman, J.**, Huang, E., Dressman, H., Horng, C.-F., Cheng, S., Tsou, M.-H., Chen, C.-M., Bild, A., Iversen, E., Huang, A., Nevins, J., and West, M. Clinico-genomic models for personalized prediction of disease outcomes. *PNAS*, 101(22): 8431-8436, 2004.

Synergistic Activities
- *Director:* Computational Sciences Initiative, University of Nebraska-Lincoln (2013-present)
- *Associate Faculty Member:* Center for Computational Sciences, University of Miami (2013-present)
- *Plant Phenotyping Faculty Advisory Committee:* Institute for Agriculture and Natural Resources, University of Nebraska-Lincoln (2014-present).
- *Patent Co-Awardee:* Seo, D., Goldschmidt, P., and **Clarke, J.** Expression analysis of coronary artery atherosclerosis, U.S. Application No. 61/105,191; International Application PCT/US09/60663, University of Miami (2009)
- *Reviewer for the following journals: Artificial Intelligence in Medicine, Biodata Mining, Breast Cancer Research and Treatment, Bioinformatics, Canadian Journal of Statistics, Computational Statistics, IEEE Pattern Analysis and Machine Intelligence, Information Sciences, Journal of the American Statistical Association, Journal of Clinical Oncology, Journal of Computational and Graphical Statistics, Journal of Stat Computation and Simulation*

Collaborators and Other Affiliations
Collaborators and co-editors: Abreu, Maria (U. of Miami [UM]), Andreev, Victor (UM), Ayad, Nagi (UM), Barkin, Jodie (UM), Benson, Andrew (University of Nebraska Lincoln [UNL]), Brennan, Meghan (UFlorida), Clarke, Bertrand (UNL), Dobra, Adrian (UWash), Drews-Elger, Katherine (UM), El-Ashry, Dorraya (UM), Gould, Felicia (UM), Guettouche, Toumy (Children's Hospital of Philadelphia), Harvey, Phil (UM), Houston, Steve (UM), Iorns, Elizabeth (Ph.D. Science Exchange), Kachman, Steve (UNL), Kopke, Hoyt (UWash), Koru-Sengul, Tulay (UM), Kresty, Laura (Medical School of Wisconsin), Lippman, Marc E. (UM), Miller, Phil (UM), Murray, Tim (Murray Ocular Oncology and Retina, Miami, FL), Myers, Amanda (UM), Nathanson, Lubov (UM), Nawaz, Zafar (UM), Nemeroff, Charles (UM), Scott, William (UM), Seo, Pearl (UM), Sussman, Dan (UM), Tsinoremas, Nick (UM), Valdes, Camilo (UM), Wahlestedt, Claus (UM), Ward, Toby (Stanford), Yu, Chi-Wai (Hong Kong University of Science and Technology), Zhang, Ming (UGeorgia) [*Total number of collaborators: 35*

Graduate advisors and postdoctoral sponsors: Stephen Fienberg (Carnegie Mellon U.); C.R. Rao (Emeritus; Pennsylvania State U.), Jerome Sacks (Emeritus; National Institute of Statistical Sciences, Research Triangle Park), Mike West (Duke U.) *Total number of advisors: 4*

Thesis advisor and postgraduate-scholar sponsor: Amiri, Saeid (Postdoctoral, UNL), Antony, Sanjay (Postdoctoral, UNL); Vasileios Stathias (Ph.D.; U. of Miami), Meghan Brennan (U. of Miami), Daniel Sussman (M.S.; U. of Miami), Jenelle Lin (M.S.; U. of Miami), Merlin Mpoudeu (UNL).

Total number of graduate students advised: 5   *Total number of postdoctoral scholars sponsored:* **2**

Biographical Sketch

Joe P. Colletti

Address: 138 Curtiss Hall, Iowa State University, Ames, IA 50011
E-mail: colletti@iastate.edu   Phone: 515/ 294-1823

(a)   Professional Preparation

Humboldt State University, California	Forestry	B.S. , 1972
Univ. of Wisconsin -Madison, Wisconsin	Forest Economics	M.S. , 1974
Univ. of Wisconsin -Madison, Wisconsin	Forest Economics	Ph.D., 1978

(b) Appointments

2006- present	Senior Associate Dean, College of Agriculture and Life Sciences, Associate Director, Iowa Agriculture and Home Economics Experiment Station
2005-2006	Interim Senior Associate Dean, College of Agriculture and Life Sciences Associate Director, Iowa Agriculture and Home Economics Experiment Station
2004 - present	Professor, Forest and Natural Resource Economics, Iowa State University
2004- 2005	Interim Chair, Department of Natural Resource Ecology & Management
1983 - 2004	Associate Professor, Iowa State University
1978– 1983	Assistant Professor, Iowa State University
1978	Instructor, Iowa State University
1977	Instructor, Univ. of Wisconsin - Madison

(c) Products - Related to Digital Agriculture

Mize, C, **J. Colletti**, W. Batchelor, J.S. Kim, E.S. Takle, and J.R. Brandle. 2007. Modeling a field shelterbelt system with the shelterbelt agroforestry modeling system. IN DR Batish, RV Kohli, S Jose, HP Singh (eds) Ecological Basis of Agroforestry, CRC Press, p 287-299.

Grala, Robert K. and **Joe P. Colletti**. 2003. Estimates of additional maize (*Zea mays*) yields required to offset costs of tree-windbreaks in Midwestern USA. *Agroforestry Systems.* 59: 11-20.

Gan, J., S. H. Kolison, and **J. P. Colletti**. 2001. Optimal forest stock & harvest with valuing non-timber benefits: A case of US coniferous forests. *Journal of Forest Policy and Economics* (2): 167-178.

Robertson, R. A. and **J. P. Colletti**. 1994. Off-site impacts of soil erosion on recreation: The case of Lake Red Rock Reservoir in central Iowa. *Journal of Soil and Water Conservation* 49(6): 576-581.

Selected Products Not Related to Proposed Project

Fang, Ying, Larry Pedigo, **Joe P. Colletti**, and Elwood R. Hart. 2002. Economic injury level for second-generation cottonwood leaf beetle (Coleoptera: Chrysomelidae) in two-year-old *Populus*. *J. Econ. Entomol*. 95(2): 313-316.

Szymanski, M. and **J. Colletti**. 1999. Combining the socio-economic-cultural implications of community owned agroforestry: The Winnebago Tribe of Nebraska. *Agroforestry Systems* 44: 227-239.

Schultz, R. C., **J. P. Colletti**, T. M. Isenhart, W. W. Simpkins, C. W. Mize, and M. L. Thompson. 1995. Design and placement of a multi-species riparian buffer strip system. *Agroforestry Systems* 29: 201-226.

Rule, L. C., **J. P. Colletti**, R. R. Faltonson, J. Rosacker, and D. Ausborn. 1995. Evaluating conversion of cropland to forests. *Journal of Forest Economics* 1(3): 329-346.

(d) Synergistic Activities

- Since July 2007, I led the development of a biomass research, education and extension facility known as the BioCentury Research Farm (BCRF). ***Impact:*** *This is the first in the nation integrated, sustainable biofuel and bioproduct feedstock research, development and demonstration farm with unique industry collaboration. It accelerates public-private innovation of biofuels, biochemicals and bioproducts.*

- In 1993 and 1994, I was co-PI (with Dr. Robert Brown, Iowa State University) on a project investigating **the potential for biomass production and conversion in Iowa**. ***Impact:*** *First report of the potential of biomass for energy and non-energy use in Iowa including the estimates of costs of production for woody and herbaceous biomass growth in fields, and agricultural residues (e.g. corn stocks). Provided framework for the "Iowa Bioeconomy Initiative."*

- From 1990 until 1998, I was Co-PI on an **alleycropping with biosolids** project. Study involved growth and yield of annual, herbaceous, and woody crops under various levels of biosolids, environmental impacts on soil and water resources, and cost-effectiveness of the system. ***Impact:*** *This study provided valuable knowledge to municipalities and state agencies related to long-term use of municipal biosolids as a fertilizer and resultant potential environmental effects.*

- From 1988-90, I was Co-PI on a project assessing **the potential of woody biomass in Iowa**. My role was to analyze the costs and benefits of the short rotation woody crop (SRWC) biomass system. Project funded by Oak Ridge National Laboratory (ORNL), Department of Energy. The goal was to evaluate the cost-effectiveness of monoculture plantations of silver maple grown on flood-prone sites in Iowa. ***Impact:*** *A national, large-scale study of producing fast-growing trees for biomass for energy.*

(e) Collaborators & Other Affiliations (Total: nine)

Lois Wright-Morton,	Iowa State University
Manjit Misra,	Iowa State University
Lulu Rodriguez,	University of Illinois at Urbana-Champaign
Zhengrui Jian,	Iowa State University
Andrew Manu,	Iowa State University
Thomas Paulsen,	Iowa State University
Janette Thompson,	Iowa State University
John Tyndall,	Iowa State University
Troy Bowman,	Iowa State University

Ivo D. Dinov
Statistics Online Computational Resource
Computational Medicine and Bioinformatics
Michigan Institute for Data Science
UMSN, University of Michigan
400 N. Ingalls, 4341
Ann Arbor, MI 48109

A. Professional Preparation

University of Sofia, Bulgaria	BS	1987-1991	Math & Computer Science
Michigan Technological University, MI	MS	1991-1993	Mathematics
Florida State University, FL	Predoc	1996-1998	Industrial Engineering
Florida State University, FL	MS	1995-1998	Statistics
Florida State University, FL	PhD	1993-1998	Mathematics
UCLA School of Medicine, CA	Postdoc	1998-2000	Neuroscience

B. Appointments

2014 – Present	Director of the Integrative Biostatistics and Informatics Core, University of Michigan Nutrition Obesity Research Center (MNORC)
2014 – Present	Director of the Biostatistics and Data Management Core, University of Michigan Udall Center for Excellence in Parkinson's Disease
2014 – Present	Co-Director of the Center for Complexity and Self-management of Chronic Disease (CSCD Center)
2013 – Present	Associate Professor, University of Michigan, Departments of System Leadership and Effectiveness, and Bioinformatics
2008 – 2013	Associate Professor of Statistics, UCLA College of Arts & Sciences
2004 – 2013	Chief Operations Officer, Center for Computational Biology (CCB), UCLA School of Medicine
2002 – Present	Director, Statistics Online Computational Resource (SOCR)
2001 – 2008	Assistant Professor of Statistics, UCLA College of Arts & Sciences
2000 - 2002	Visiting Assistant Professor, Program in Computing, UCLA Mathematics
1998 - 2000	NIH Postdoctoral Fellow, Department of Neurology, UCLA School of Medicine

C. Publications

Closely Related

1. **Dinov**, ID, Sanchez, J, and Christou, N. (2008) Pedagogical Utilization and Assessment of the Statistic Online Computational Resource in Introductory Probability and Statistics Courses, Journal of Computers & Education, 50, 284–300.
2. **Dinov**, ID, Christou, N, and Sanchez, J. (2008) Central Limit Theorem: New SOCR Applet and Demonstration Activity. Journal of Statistics Education, 16(2):1-15.
3. **Dinov**, ID, Christou, N, and Gould, R (2009) Law of Large Numbers: the Theory, Applications and Technology-based Education. JSE, Vol. 17, No. 1, 1-15, 2009.
4. **Dinov**, ID and Christou, N. (2011) Web-based Tools for Modeling and Analysis of Multivariate Data: California Ozone Pollution Activity, International Journal of Mathematical Education in Science and Technology, *(JMEST), 42(6):789-805, DOI: 10.1080/0020739X.2011.562315*.
5. **Dinov**, ID, Kamino, S, Bhakhrani, B, Christou, N. (2013) Technology-Enhanced Interactive Teaching of Marginal, Joint and Conditional Probabilities: The Special Case of Bivariate Normal Distribution, Teaching Statistics, *35(3): 131–139.*

Other Significant Publications

1. **Dinov**, ID, Petrosyan, P, Liu, Z, Eggert, P, Zamanyan, A, Torri, F, Macciardi, F, Hobel, S, Moon, SW, Sung, YH, Jiang, Z, Labus, J, Kurth, F, Ashe-McNalley, C, Mayer, E, Vespa, PM, Van Horn, JD, Toga, AW. (2014) *The Perfect Neuroimaging-Genetics-Computation Storm: Collision of Petabytes of Data, Millions of Hardware Devices and Thousands of Software Tools*, Brain Imaging and Behavior, *8(2):311-322,* DOI: 10.1007/s11682-013-9248-x.
2. **Dinov**, ID, Torri, F, Macciardi, F, Petrosyan, P, Liu, Z, Zamanyan, A, Eggert, P, Pierce, J, Genco, A, Knowles, JA, Clark, A, Van Horn, JD, Ames, J, Kesselman, C, Toga, AW. (2011) *Applications of the Pipeline Environment for Visual Informatics and Genomics Computations*, BMC Bioinformatics, *12:304, doi:10.1186/1471-2105-12-304.*
3. **Dinov**, ID, Lozev, KM, Petrosyan, P, Liu, Z, Eggert, P, Pierce, J, Zamanyan, A, Chakrapani, S, Van Horn, JD, Parker, DS, Magsipoc, R, Leung, K, Gutman, B, Woods, RP, Toga, AW. (2010), Neuroimaging Study Designs, Computational Analyses and Data Provenance Using the LONI Pipeline, PLoS ONE, 5(9): e13070. doi:10.1371/journal.pone.0013070.
4. **Dinov**, ID, Sanchez, J, and Christou, N. (2008) Pedagogical Utilization and Assessment of the Statistic
5. **Dinov** ID, Rubin D, Lorensen W, Dugan J, Ma J, Murphy S, Kirschner B, Bug W, Sherman M, Floratos A, Kennedy D, Jagadish HV, Schmidt J, Athey B, Califano A, Musen M, Altman R, Kikinis R, Kohane I, Delp S, Parker DS, Toga AW. (2008) iTools: A Framework for Classification, Categorization and Integration of Computational Biology Resources. PLoS ONE 3(5): e2265. doi:10.1371/journal.pone.0002265.

D. Synergistic Activities

- Probability Distributome Project (www.Distributome.org): Developing webapps, interactive simulators and learning modules for applied probability data-driven modeling
- The Probability and Statistics EBook (http://wiki.stat.ucla.edu/socr/index.php/EBook), which has over 1.5 million users
- Directing the Statistics Online Computational Resource (www.SOCR.umich.edu)

E. Collaborators & Other Affiliations

Trainees:
- **Undergraduate (20)**: Bae-Cheol Shin, Jenny Nguyen, Keith Kan, Chiachi Lo, Raymond Chen, John Guo Jun, Shelley Y. Zhou, Hanzen Shi, Yang Yuan, Jameel Al-Aziz, Chin-Pang Ho, Kenneth Lo, Priscilla Chui, Lei Jin, Victor Zhu, Beryl Lou, Charles Dang, Stephan Chiu, Jay Zhou, Agapios Constantinides, Siu-Ling Teresa Lam, Ashwini Khare, Rami Elkest.
- **Graduate (15)**: Erh-Fang Lee, Andrew Wang, Guogang Hu, Kwun Trudy Poon, Dushyanth Krishnamurty, Annie Che, Ariana Anderson, Brigid Wilson, Yangyi He, Ryan Rosario, Rahul Gidwani, David Zes, Antonietta Pepe, Scott Kamino, James Zhang, Alexandre Kalinin, Selvam Palanimalai, Ashwini Khare.
- **Postdocs (8)**: Alexandre Cunha, Duygu Tosun, Yonggang Shi, Meihe Xu, Junning Li, Young Hee Sung, Seok Woo Moon, Jinfeng (James) Zhang.

Collaborators (24):
- **UMichigan**: Brian Athey, HV Jagadish, Jeremy Taylor, Gregory Wolf, Marita Titler
- **UCLA**: Nicolas Christou, Chris Lee, Shantanu Joshi, Katherine Narr, Stan Osher, Stott Parker, Nader Pouratian, David Shattuck, Stefano Soatto, Luminita Vese, Roger Woods
- **USC**: Anand Joshi, Yonggang Shi, Elizabeth Sowell, Paul Thompson, Arthur Toga, Jack Van Horn
- **PSU**: Dennis Pearl
- **UAH**: Kyle Siegrist

Placid M. Ferreira

Mechanical Science and Engineering

University of Illinois at Urbana-Champaign (UIUC)

1206 West Green Street, Urbana, IL 61801-2906

Ph: 217-333-0639 Email: pferreir@illinois.edu

PROFESSIONAL PREPARATION

University of Bombay	Mechanical Engineering	B.E., 1980
Indian Institute of Technology, Bombay	Mechanical Engineering	M.S., 1982
Purdue University	Industrial Engineering	Ph.D., 1987

APPOINTMENTS

2009 – Present	Head, Mechanical Science and Engineering Department, UIUC
2004 – 2010	Director, Nanoscale Chemical-Electrical-Mechanical Manufacturing Systems-NSF Nanoscale Science and Engineering Center
2014 – Present	Tungchao Julia Lu Professor, Department of Mechanical Science and Engineering, UIUC (previously, Grayce Wicall Gauthier Professor from 2003)
1999 – 2002	Associate Head for Graduate Studies, Department of Mechanical and Industrial Engineering, UIUC
1998 – Present	Professor, Department of Mechanical Science and Engineering, UIUC
1993 – 1998	Associate Professor, Department of Mechanical and Industrial Engineering, UIUC
1987 – 1993	Assistant Professor, Department of Mechanical and Industrial Engineering, UIUC
1983 – 1986	Research Assistant, Precision Engineering Project, School of Industrial Engineering, Purdue University
1982 – 1987	Research Assistant, CIDMAC, Purdue University

PRODUCTS HIGHLY RELEVANT TO THIS PROPOSAL

[1] Reveliotis, S. A., M. A. Lawley, and P. M. Ferreira, "Polynomial-Complexity Deadlock Avoidance Policies for Sequential Resource Allocation Systems," IEEE Transactions on Automatic Control, 42:10, 1344-1357, 1997.

[2] Carr, K. and P. M. Ferreira, "Verification of Form Tolerances, Part II: Cylindricity and Straightness of a Median Line," Precision Engineering, Journal of the American Society for Precision Engineering, 17, 144-156, 1995.

[3] Hsu K. H., P. L. Schultz, P. M. Ferreira, and N. X. Fang, "Electrochemical Nanoimprinting with Solid-State Superionic Stamps," Nano Letters, 7:2, 446-451, 2007.

[4] Yao, Q., J. Dong, P. M. Ferreira, "A Novel Parallel-Kinematics Mechanism for Integrated, Multi-axis Nano-positioning. Part 1: Kinematics and Design for Fabrications," Precision Engineering, 32:1, 7-19, January 2008.

[5] Koo, B., X. Zhang, J. Dong, S. M. Salapaka and P. M. Ferreira, "A 2 Degree-of-Freedom SOI-MEMS Translation Stage With Closed-Loop Positioning," ASME/IEEE J MEMS,Vol. 21, No. 1, pp. 13-22 February 2012.

OTHER SIGNIFICANT PRODUCTS

1. Saeidpourazar, R., R. Li, Y. Li, M. D. Sangid, C. Lü, Y. Huang, J. A. Rogers, and P. M. Ferreira, "Laser-Driven Micro-Transfer Placement of Prefabricated Microstructures," ASME/IEEE J MEMS,21, 5, pp. 1049-1058, 2012. (DOI: 10.1109/JSEN.2011.2127472)

2. Seth, A., D. Klabjan, and P. M. Ferreira, "Analyses of Advanced Iterated Tour Partitioning Heuristics for Generalized Vehicle Routing Problems," Networks, Vol. 61, No. 4, pp. 290-308, July 2013.
3. Jacobs, K., K. H. Hsu, X. Han, A. Kumar, B. P. Azeredo, N. X. Fang and P. M. Ferreira, "Solid State Superionic Stamping with Silver Iodide-silver Metaphosphate Glass," Nanotechnology, 22, 425301, 2011.
4. Yoon, J., A.J. Baca, S.-I. Park, P. Elvikis, J.B. Geddes, L. Li, R.H. Kim, J. Xiao, S. Wang, T.H. Kim, M.J. Motala, B.Y. Ahn, E.B. Duoss, J.A. Lewis, R.G. Nuzzo, P.M. Ferreira, Y. Huang, A. Rockett And J.A. Rogers, "Ultrathin Silicon Solar Microcells for Semitransparent, Mechanically Flexible and Microconcentrator Module Designs," Nature Materials 7, 907-915, (2008) (doi:10.1109/JMEMS.2009.2020371).
5. Dong, J., C. Yuan, J. A. Stori, and P. M. Ferreira, "Development of a High-speed Three-axis Machine Tool using a Novel Parallel-kinematics X-Y Table," International Journal of Machine Tools and Manufacture, 44:12-13, 1355-1371, 2004.

SYNERGISTIC ACTIVITIES

1. <u>Editorial Board:</u> International Journal of Computer Integrated Manufacturing
2. <u>Senior Member:</u> North American Manufacturing Research Institute
3. <u>Member:</u> Science Advisory Board, Singapore Inst. of Manuf. Technol. (SIMTech) 2004 – 2011
4. <u>Editor:</u> IEEE Transactions of Automation Science of Engineering, 2003-2008; IIE Trans. 2009 - 2011

COLLABORATORS & OTHER AFFILIATIONS

Collaborators and Co-Editors (last 48 months):

A. Alleyne (MechSE, UIUC), K. Barton (Michigan), A. Carlson (Intel, Inc.), K. Choquette (ECE, UIUC), J. Dong (North Carolina State University), N. Fang (MIT), Y. Huang (Northwestern University), K. Hsu (MechSE, UIUC), P. Kenis (ChBME, UIUC), D. Klabjan (Northwestern University), X. Li (ECE, UIUC), S. Mishra (RPI), J.-U. Park (Korea University), J. Rogers (MatSE,UIUC), R. Saeidpourazar (Brooks Automation), S. Salapaka (MechSE, UIUC), M. D. Sangid (Purdue University), S. Sinha (MechSE, UIUC), M. Sitti (CMU). (Total: 19)

Graduate Advisor (Total: one):

C. Richard Liu, Department of Industrial Engineering, Purdue University, W. Lafayette, IN

Graduate Students Supervised:

Current Students at UIUC (Total: 9): Jorge Correa Panesso, Bon Jin Koo, Alaa, Numair Ahmad, Miki, Kyle Jacob, Bruno Azeredo, Nishana Ismail, Shamma Barna

Past PhD Students (Total: 17): V. Kiridena (Ford, Inc.), K. Carr (Packer Engineering), V. Hetem (Chrysler, Inc.) O. Ruiz (Eiafat University, Columbia), Z. Pei (Kansas State University), B. ElKhasawneh (KU-STAR, UAE), S. Reveliotis (Georgia Tech), M. Lawley (Purdue University), Q. Yao (Schlumberger, Inc), R. Marin (Schlumberger, Inc), M.C. Lee (Aerospace Corporation), H. Tajbakhsh (Self-Employed), C. Yuan (GM Research Labs) , J. Dong (North Carolina State University) D. Mukhophadyay (Brukner,Inc.) Anupam Seth (Yahoo, Inc.); Alaa Alokaily (Lam Research Corp.)

Post-doctoral Scholars (Total: two): Jeong Young (Korea Polytechnic University, S. Korea), Reza Saeidpourazar (Brooks Automation)

Kevin Franklin

Professional Preparation

Old Dominion University Norfolk, VA	Psychology	Bachelors of Science, 1981
Old Dominion University Norfolk, VA	Education	Masters of Education, 1982
University of San Francisco San Francisco, CA	Organization and Leadership	Doctor of Education 1987-1994

Appointments:

- Associate Director, National Center for Supercomputing Applications, 2014-Present
- Senior Advisor to the Director for Diversity and Inclusion, National Center for Supercomputing Applications, 2014-Present
- Executive Director, Institute for Computing in Humanities, Arts, and Social Science, 2007-Present.
- Senior Research Scientist, National Center for Supercomputing Applications, 2007-Present.
- Research Professor, Educational Policy Studies, University of Illinois, 2008.
- Adjunct Associate Professor, Department of African-American Studies, University of Illinois, 2008.
- Executive Director, University of California Humanities Research Institute, UC Irvine, 2002-2007.
- Deputy Director, University of California Supercomputer Center, UC San Diego 2000-2001.
- Executive Director, Nonprofit Ventures, Inc, 1998-2000.
- Interim Executive Director, Summerbridge National, 1997-1998.
- Founding Executive Director, Multicultural Alliance, 1989-1997.
- Senior Fellow, San Francisco State University, Urban Institute, 1993-1997.
- Director, San Francisco State University, Urban Scholars Program, 1992-1994.

Products:

- Franklin, K. D., & Rodriguez'G, K. (2008, November 24). The Next Big Thing in Humanities, Arts and Social Science Computing: 18thConnect. Retrieved June 24, 2015, from http://www.hpcwire.com/2008/11/24/the_next_big_thing_in_humanities_arts_and_social_science_computing_18thconnect/
- Goldberg, D. T., & Franklin, K. D. (2007). Socializing Cyberinfrastructure. *CTWatch Quarterly*, *3*(2). Retrieved from http://www.ctwatch.org/quarterly/articles/2007/05/socializing-cyberinfrastructure/index.html
- Hernandez, F. A., Franklin D., K., Washburn, J., Craig B., A., & Simon J., A. (2014). Education in the Age of Extreme Digital Exploration, Discovery, and Innovation. In M. Peters, T. Besley,

& D. Araya (Eds.), *The new development paradigm: education, knowledge economy and digital futures*. New York: Peter Lang.

- Franklin, K.D. (June 24, 2015). Developing a Smart Americas. Retrieved from http://riacnet.org/archivos/informe/eng-informe-2014.pdf
- Kevin D. Franklin, & Karen Rodriguez'G. (2008, July 29). The Next Big Thing in Humanities, Arts and Social Science Computing: Cultural Analytics. Retrieved June 24, 2015, from http://www.hpcwire.com/2008/07/29/the_next_big_thing_in_humanities_arts_and_social _science_computing_cultural_analytics/

Synergistic Activities:

1. Member, Advisory Board The Extreme Science and Engineering Discovery Environment XSEDE
2. Member, Working Groups on Innovation, Workforce Development, and Science and Technology Development, Organization of the American States (OAS)
3. Co-Founder and Executive Committee Member, Humanities, Arts, Science and Technology Advanced Collaboratory (HASTAC)
4. Investigator, Humanities High-performance Computing Collaboratory (HpC): New Horizons in Scale and Data
5. Member, Planning Committee, Richard Tapia, Diversity in Computing Conference 2001

Collaborators & Other Affiliations:

Collaborators (Total: Four):

Dr. Fernando A. Hernandez, University of Illinois, Long Beach, California
Dr. Alan Craig, Extreme Science and Engineering Environment, Urbana-Champaign, Illinois
Dr. Judith Washburn, California State University, Los Angeles, California
Dr. Simon J. Appleford, Crighton University, Omaha, Nebraska

Graduate Advisors and Postdoctoral Sponsors (Total: One):

Dr. Robert Lamp, University of San Francisco

Thesis Advisor and Postgraduate-Scholar Sponsor (Total: Three):

Dr. Jennifer Guiliano, Indiana University-Purdue University Indianapolis
Dr. Michael Simeone, Arizona State University, Arizona
Dr. Mike Black, University of Illinois, Urbana-Champaign, Illinois

MICHAEL J. FRY

Department of Operations, Business Analytics & Information Systems
University of Cincinnati, 533 Lindner Hall, Cincinnati, OH 45221-0130
(513) 556-0404 mike.fry@uc.edu

A. Education

TEXAS A&M UNIVERSITY, College Station, TX USA
   B.S. 1996, Industrial Engineering (*Summa cum Laude*)

UNIVERSITY OF MICHIGAN, Ann Arbor, MI USA
   M.S.E 1998, Ph.D. 2002, Industrial & Operations Engineering

B. Appointments

UNIVERSITY OF CINCINNATI, Department of Operations, Business Analytics &
   Information Systems
   7/2015-Current: Director, Center for Business Analytics
   8/2014-Current: Department Head
   9/2013-Current: Lindner Research Fellow
   1/2013-8/2014: Assistant Director, Center for Business Analytics; 9/2008-8/2014: Associate
   Professor; 1/2002-8/2008: Assistant Professor

UNIVERSITY OF BRITISH COLUMBIA, Operations & Logistics Department
   8/2011-7/2012: Visiting Professor

CORNELL UNIVERSITY, Samuel C. Johnson Graduate School of Management
   9/2008–9/2009: Visiting Associate Professor

C. Publications

(i) Selected Five Relevant to Proposed Research

1. J. Camm, J. Cochran, M. Fry, J. Ohlmann, D. Anderson, D. Sweeney, T. Williams, *Essentials of Business Analytics*, 1st Edition, Cenage, 2015.
2. M. Yang, T. Allen, M. Fry and D. Kelton, "The Call for Equity: Simulation-Optimization Models to Minimize the Range of Waiting Times," *IIE Transactions*, 45:7, 1-15, 2013. 3.
3. M. Yang, M. Fry and C. Scurlock, "The ICU Will See You Now: Efficient-Equitable Admission Policies for a Surgical ICU with Batch Arrivals," *IIE Transactions*, 2015.
4. M. Gibson, J. Ohlmann, M. Fry, "An Agent-Based Stochastic Ruler Approach for a Knapsack Problem with Competition-Induced Uncertainty," 37:3, 598-609, *Computers & Operations Research*, 2010.
5. J. Ohlmann, M. Fry, B. Thomas, "Route Design for Lean Production Systems," *Transportation Science*, 42:3, 352-370, 2008.

(ii) Selected Additional Five Significant Publications

1. D. Anderson, D. Sweeney, T. Williams, J. Camm, J. Cochran, M. Fry, J. Ohlmann, *Quantitative Methods for Business*, 13th Edition, Cenage, 2016.
2. D. Anderson, D. Sweeney, T. Williams, J. Camm, J. Cochran, M. Fry, J. Ohlmann, *An Introduction to Management Science*, 14th Edition, Cenage, 2015.
3. M. Yang, M. Fry, D. Kelton, and T. Allen, "Improving Voting Systems through Service-Operations Management," *Production and Operations Management*, 23:7, 1083-1097, 2014.
4. B. Bichescu, M. Fry and G. Polak, "Workload Balancing through Recurrent Subcontracting," *Production and Operations Management*, 18:1, 33-47, 2009.
5. M. Fry, M. Magazine, and U. Rao, "Firefighter Staffing with Temporary Absences and Wastage," *Operations Research*, 54:2, 353-365, 2006.

D. Synergistic Activities

1. **Director of Center for Business Analytics**: The University of Cincinnati Center for Business Analytics is the leading such Center in the nation. It promotes analytics research, education and industry-academic collaboration. The Center currently has 20 corporate members including Procter & Gamble, Macy's, SAS, EY, US Bank, Kroger, etc.
2. **Author of Leading Business Analytics Textbooks:** Co-author on three of the leading textbooks in area of business analytics: *Essentials of Business Analytics, Quantitative Methods for Business* and *Introduction to Management Science*, all published by Cengage.
3. **Industry Consulting Experience:** Extensive experience in outside analytics consulting, including work with such companies/organizations as Dell Computer, Starbucks Coffee Company, Great American Insurance Company, Cincinnati Fire Department, United States Environmental Protection Agency, Copeland Corporation, Boeing, Procter & Gamble, Cardinal Health, LeanCor Logistics, Hamilton County Board of Elections.
4. **Editorial Positions:** Associate Editor, OMEGA; Editorial board, *Production and Operations Management* and *Journal of Quantitative Analysis in Sports* and *Decision Sciences.* Special issue editor, *Interfaces*.

E. Collaborations and Other Affiliations

1. **Collaborators (TOTAL: 16):** Jeff Ohlmann (U. of Iowa), Jeff Camm (Wake Forest U.), Jim Cochran (U. of Alabama), Dave Anderson (U. of Cincinnati), Dennis Sweeney (U. of Cincinnati), Tom Williams (Rochester Institute of Technology), David W. Kelton (U. of Cincinnati), Ted Allen (Ohio State U.), Corey Scurlock (Advanced ICU Care), Xinfang Wang (Georgia Southern U.), Rusty Meyers (LeanCor LLC), Amitabh Raturi (U. of Cincinnati), Harish Krishnan (U. of British Columbia), Ruonon Zhang (Xi'an Jiaotong-Liverpool U.), Nicole Adler (Hebrew U. of Jerusalem), Hamed Hashminia (San Francisco State U.)
2. **Ph.D. Advisors (TOTAL: 4):** Roman Kapuscinski, John Psarouthakis Research Professor of Manufacturing Management, U. of Michigan (co-chair), Tava Olsen, Ports of Auckland Chair of Logistics and Supply Chain Management, U. of Auckland (co-chair), Izak Duenyas (U. of Michigan), James Bean (U. of Oregon)
3. **Ph.D. Students Supervised (TOTAL: 9):** Feng Mai, (2015), Fei Qin (2014), Dror Hermel (2013, U. of British Columbia), Saravanan Kuppusamy (2014), Muer Yang (2012), Claudia Rosales (2011), Jun Liu (2009, U. of Toronto), Bogdan C. Bichescu (2006), Yong Liu (2005).
4. **Master's Students Supervised (TOTAL: 30):** Neil Eisner (2003), Samir Kulkarni (2004), Rajesh Radhakrishnan (2004), Neelima Reddy (2005), Paul Bessire (2005), Bogdan Bichescu (2005), Ying Huang (2005), Robert Carter (2006), Rachel LaRosa (2006), Andrew Lundberg (2006), Jonathan Healey (2006), Claudia Rosales (2007), Alan Shukairy (2008), Larisa Vaysman, (2009), Michael Platt (2009), Yi-Chin Cher Huang (2010), Michael Bernstein (2011), Kevin Roa (2013), Zhen Guo (2013), Ryan Prasser (2013), Wejing Song (2013), Matt Schmucki (2014), Joshua Phipps (2014), Abhimana Khumbara (2014), Ashmita Bora (2014), Vignesh Rajendran (2014), Lingchong Mai (2014), Ole Jacobsen (2014), Chris Fant (2014), Brad Barker (2015)

Robert Grossman
The University of Chicago

Professional Preparation
Undergraduate: Harvard University, Cambridge, MA, Mathematics, B.A, 1980
Graduate: Princeton University, Princeton, NJ, Applied Mathematics, Ph.D, 1985
Postdoctoral: University of California, Berkeley, Berkeley, CA, Mathematics, 1984-1988

Appointments
2013 –   Director, University of Chicago Center for Data Intensive Science (CDIS)
2011 –   Chief Research Informatics Officer, Biological Sciences Division, Univ. of Chicago
2011 – 2013 Director, Center for Research Informatics, Univ. of Chicago
2010 –   Core Faculty and Senior Fellow, Computation Institute and Institute for Genomics & Systems Biology; Professor, Department of Medicine, University of Chicago.
2008 –   Director, Open Cloud Consortium
2002 –   Founder & Managing Partner, Open Data Group
1998 – 2010 Director, National Center for Data Mining, UIC
1994 – 2001 Founder and Chairman, Magnify, Inc.
1988 – 2010 University of Illinois at Chicago, Mathematics, Statistics and Computer Science, Professor, 1995-2010; Assistant Professor, 1988-1991; Associate Professor, 1991-1995; Professor, Computer Science, 2004-2010; Professor, Department of Bioengineering, 2009-2010.
1984 – 1988 Univ. of California, Berkeley, NSF Postdoc Research Fellow, Department of Mathematics

Closely Related Products
1. Allison Heath, Matthew Greenway, Raymond Powell, Jonathan Spring, Rafael Suarez, David Hanley, Chai Bandlamudi, Megan McNerney, Kevin White and Robert L Grossman, Bionimbus: A Cloud for Managing, Analyzing and Sharing Large Genomics Datasets, Journal of the American Medical Informatics Association, 2014.
2. Heidi L. Alvarez, Malcolm Atkinson, Robert L. Grossman, Matthew Greenway, Christine Harvey, Allison P. Heath, Iraklis Klampanos, Joe J. Mambretti, Ray Powell, Rafael D. Suarez, Walt Wells and Kevin White, The Design of a Community Science Cloud: The Open Science Data Cloud Perspective, SC Companion: High Performance Computing, Networking Storage and Analysis, ACM Press, 2012.
3. Yunhong Gu and Robert Grossman. Towards Efficient and Simplified Distributed Data Intensive Computing, IEEE Transactions on Parallel and Distributed Systems (TPDS), IEEE Press, 2011.
4. Robert L. Grossman, Yunhong Gu, Joe Mambretti, Michal Sabala, Alex Szalay, and Kevin White, An Overview of the Open Science Data Cloud, Proceedings of the 19th ACM International Symposium on High Performance Distributed Computing (HPDC '10), 2010.
5. Yunhong Gu and Robert L Grossman, Sector and Sphere: Towards Simplified Storage and Processing of Large Scale Distributed Data, Philosophical Transactions of the Royal Society A, Volume 367, Number 1897, pages 2429-2445, 2009.

Other Significant Products
1. Daniel Mandl, Stuart Frye, Pat Cappelaere, Matthew Handy, Fritz Policelli, McCloud Katjizeu, Guido Van Langenhove, Guy Aubé, Jean-Francois Saulnier, Rob Sohlberg, Julie A. Silva, Nataliia Kussul, Sergii Skakun, Stephen G. Ungar, Robert Grossman, and Jorg Szarzynski, Use of the Earth Observing One (EO-1) Satellite for the Namibia SensorWeb Flood Early Warning Pilot, IEEE J. of Selected Topics in Applied Earth Observations and Remote Sensing, Vol. 6, No. 2, April 2013, pages 298-308.
2. Wenxuan Gao, Robert Grossman, Philip Yu, Christopher Brown, Matthew Slattery, Lijia Ma and Kevin White, Discovering Geometric Patterns in Genomic Data, ACM Conference on Bioinformatics, Computational Biology and Biomedicine, ACM Press, 2012.

3. Shi Yu, Robert Grossman and Andrey Rzhetsky, Global and Local Approach of Part-of-Speech Tagging for Large Corpora, AAAI-2012 Fall Symposium on Information Retrieval and Knowledge Discovery in Biomedical Text, 2012.
4. Collin Bennett, Robert L. Grossman, David Locke, Jonathan Seidman and Steve Vejcik, MalStone: Towards a Benchmark for Analytics on Large Data Clouds, The 16th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD 2010), ACM, 2010.
5. Yunhong Gu and Robert L. Grossman, UDT: UDP-based Data Transfer for High-Speed Wide Area Networks, Computer Networks, Volume 51, Number 7, pages 1777-1799, 2007.

Synergistic Activities in Data Science
- I have led the development of a variety of open source software for data intensive science, including UDT, a high performance data transport protocol; Augustus, a PMML compliant application for building and deploying statistical models; and Sector/Sphere, a platform for data intensive computing,
- Chair, Open Cloud Consortium (OCC), a not-for-profit industry consortium that operates and manages the Open Science Data Cloud (OSDC), the Open Cloud Testbed, and other cloud infrastructure, 2008 – present. As Chair of the OCC, I lead the efforts to build cloud-based infrastructure to support data intensive science. The OSDC is one of the research community's largest science clouds.
- Member, Committee on Future Directions for NSF Advanced Computing Infrastructure to Support U.S. Science in 2017-2020; Computer Science and Telecommunications Board; Division on Engineering and Physical Sciences; National Research Council.
- Board of Directors of the ACM Special Interest Group on Knowledge Discovery and Data Mining (SIGKDD) for the periods 2005-2009, 2009-2011, and 2011-2013.
- Chair, Data Mining Group (DMG) 2001-2010, an industry consortium that develops standards for data mining. During this period, the DMG developed versions 0.9, 1.0, 1.1, 2.0, 2.1, 3.0, 3.1, 3.2 and 4.0 of the Predictive Model Markup Language (PMML), an XML language for predictive modeling.

Collaborators and Other Affiliations
Collaborators and Co-Editor: Total: 163
Heidi Alvarez (FIU); John Anastasi (UofC); Gordon Anderson (Pacific Northwest National Laboratory); Nathaniel Anderson (Seattle Children's); Robert K. Arthur (UofC); Malcolm Atkinson (University of Edinburgh); Guy Aubé (Canadian Space Agency); Sukru Aynacioglu (Gaziantep University); Stuart Bailey (InfoBlox Inc.); Chai Bandlamudi (UofC); Ancha Baranova (George Mason University); Elizabeth Bartom (Volcani Center); Charles F. Bearden (UT); Collin Bennett (Open Data Group); Tanya Berger-Wolf (UIC); Elmer Bernstam (UT); David R. Blair (UofC); Christopher D. Brown (UofC); Marina Brumin (Volcani Center); Søren Brunak (Technical University of Denmark), Rajmonda Caceres (UIC); Shawn R. Campagna (University of Tennessee Knoxville; plus 141 others.

Graduate and Post-Doctoral Advisors: Total: 2
Thesis Advisor: Elias Stein, Princeton University
Post-Graduate Scholar Sponsor: Jerold Marsden, Caltech (deceased)

Thesis Advisor and Postgraduate-Scholar Sponsor: Total: 12
PhD Students: Wenxuan Gao, 2014, Yahoo Research; Jia Chen, 2011, Amazon; Yong Mao, 2009, Twitter; Yunghong Gu, 2005, Google; Chetan Gupta, 2006, Hitachi Americas R & D; Harinath Sivakumar, 2002, Microsoft; Andrei Turinsky, 2002, SickKids Hospital; Charles (Xiao) Qin, 1994, Breakwater Trading

Postdoctoral supervision: Maria Patterson, 2014 – present, University of Chicago; Allison Heath, 2013 – present, University of Chicago

BIOGRAPHICAL SKETCH
Jun Huan

PROFESSIONAL PREPARATION

Peking University, Beijing, China	Biochemistry & Molecular Biology	B.S. 1997
Oklahoma State University	Computer Science	M.S. 2000
University of North Carolina, Chapel Hill	Computer Science	Ph.D. 2006

APPOINTMENTS

2014 – Present	Professor, Department of Electrical Engineering and Computer Science, University of Kansas
2014- Present	Professor (adjunct appointment) Division of Health Science Research, KU School of Medicine
2012 – Present	Director, the Data Science and Computational Life Sciences Laboratory Information and Telecommunication Technology Center (ITTC)
2008 – present	Courtesy Professor, Center of Bioinformatics, University of Kansas
2007 – Present	Courtesy Professor, Bioengineering Program, University of Kansas
2013	Visiting Professor, GlaxoSmithKline Inc., Collegeville, PA
2011 – 2014	Associate Professor, Department of Electrical Engineering and Computer Science, University of Kansas
2006 – 2011	Assistant Professor, Department of Electrical Engineering and Computer Science, University of Kansas

PRODUCTS

5 Most Closely Related to the Proposed Research

1. Hongliang Fei and Jun Huan, Structured Sparse Boosting for Graph Classification, *ACM Transactions on Knowledge Discovery from Data,* Vol. 9, Iss. 1, No. 4, 2014

2. Ruoyi Jiang, Hongliang Fei, **Jun Huan**, A Family of Joint Sparse PCA Algorithms for Anomaly Localization in Network Data Streams, *IEEE Transactions on Knowledge and Data Engineering*, vol. 25, No. 1, pp. 2421-2433, 2013

3. Jintao Zhang and **Jun Huan**, Inductive Multi-Task Learning with Multiple View Data, *The 18th ACM SIGKDD Conference on Knowledge Discovery and Data Mining (**SIGKDD'12**)*, Beijing, China, August 2012

4. Hongliang Fei and **Jun Huan**, Structured Feature Selection and Task Relationship Inference for Multi-Task Learning, *in Proceedings of the IEEE International Conference on Data Mining (**ICDM'11**)*, Vancouver, Canada, December 2011, acceptance rate 101/786 = 12%, **Best Student Paper** (1/101 accepted full papers)

5. Hongliang Fei and **Jun Huan,** L2 Norm Regularized Feature Kernel Regression For Graph Data, *in Proceedings of the ACM 18th Conference on Information and Knowledge Management* (**CIKM'09**), Hong Kong, China, November 2009, pp.593-600, acceptance rate 123/847=15%, **Best Paper Runner-up** (6/123 accepted papers)

5 Other Significant Products

6. Brian Quanz and **Jun Huan**, CoNet: Feature Generation for Multi-View Semi-Supervised Learning with Partially Observed Views, *the 21st ACM Conference on Information and Knowledge Management (**CIKM'12**)*, Maui, Hawaii, October 2012, acceptance rate 146/1088=13%

7. Jia Yi, Wenrong Zeng and **Jun Huan**, Non-stationary Bayesian Networks Based on Perfect Simulation, *the 21st ACM Conference on Information and Knowledge Management (**CIKM'12**)*, Maui, Hawaii, October 2012, pp. pp. 1095-1104

8. Jintao Zhang and **Jun Huan**, Multi-target protein-chemical interaction prediction using task-regularized and boosted multi-task learning, *ACM Conference on Bioinformatics, Computational Biology and Biomedicine (ACM BCB'12)* , Orlando, FL, October 2012, acceptance rate 33/159=20%

9. Jintao Zhang and **Jun Huan**, Drug-induced QT Prolongation Prediction Using Co-regularized Multi-view Learning, *the IEEE International Conference on Bioinformatics and Biomedicine (BIBM'12)* , Philadelphia, Pennsylvania, October 2012, acceptance rate 59/299=20%

10. Hongliang Fei and **Jun Huan**, Boosting with Structure Information in the Functional Space: an Application to Graph Classification, *in Proceedings of the 16th ACM SIGKDD Conference on Knowledge Discovery and Data Mining* (**SIGKDD'10**), Washington DC, July 2010, pp.643-652, acceptance rate 101/578 = 17%

SYNERGISTIC ACTIVITIES
1. Program Committee Member, the ACM International Conference on Knowledge Discovery and Data Mining, 2009-2015
2. Program Committee Member, the International Conference on Machine Learning, 2013-2014
3. Program Committee Member, the ACM Conference on Information and Knowledge Management, 2009-2014
4. Program Committee Member, the IEEE International Conference on Data Mining, 2009-2013
5. Program Committee Member, the IEEE International Conference on Bioinformatics & Biomedicine, 2007-2015

COLLABORATORS & OTHER AFFILIATIONS
Collaborators and Co-Editors
Collaborators (Total: Five):
1. Jeffery Aubé, Ph.D., Professor, School of Pharmacy, University of Kansas
2. Deepak Bandyopadhyay, Ph.D., Principle Scientist, Department of Computational and Structural Chemistry, GlaxoSmithKline Inc.
3. Carol Friedman, Professor, College of Physicians and Surgeons, Columbia University
4. Leiming Shi, Ph.D., Principal Investigator, National Center for Toxicological Research, US Federal Food Drug Administration.
5. Alexander Tropsha, Ph.D., K.H. Lee Distinguished Professor and Chair, School of Pharmacy, University of North Carolina at Chapel Hill

Co-Editors (Total: One):
Jake Chen, Mohammed Zaki

Graduate Advisors and Postdoctoral Sponsors (Total: Two)
Ph. D. Co-advisor   Dr. Wei Wang   University of California, Los Angeles
Ph. D. Co-advisor   Dr. Jan Prins   University of North Carolina at Chapel Hill

Thesis Advisor and Postgraduate-Scholar Sponsor
Post-Doctoral Associates at KU: Xiang Cheng, Ph.D.,2014; Alexios Koutsoukas, Ph.D., 2014
Ph.D. Students at KU: Sai Nivedita Chandrasekaran, Hongliang Fei (2012), Yi Jia (2012), Chao Lan, Xiaoli Li, Xiaotong Lin (2012), Meenakshi Mishra, Brian Quanz (2012), Aaron Smarter (2011), Joseph St. Amand, Jintao Zhang (2012)
M.S. Student at KU: Avindra Fernando (2012), Ruoyi Jiang (2012), Fei Seak Lei (2008), Abhinav Peddi (2008), Xiaohong Wang (2009)
Total number of graduate students advised: 16; Total number of postdoctoral scholars sponsored: 2

Yinlun Huang, Professor
Director, Laboratory for Multiscale Complex Systems Science and Engineering
Dept. of Chem. Eng. & Mat. Sci., Wayne State University, Detroit, Michigan 48202
Phone: (313) 577-3771; FAX: (313) 577-3810; E-mail: yhuang@wayne.edu

Professional Preparation

Kansas State University	Chemical Engineering	Ph.D., 1992; M.S., 1988
Zhejiang University, China	Control Sci. & Eng.	M.S. study, 1984-86
Zhejiang University, China	Chemical Engineering	B.S. 1982
University of Texas at Austin	Chemical Engineering	Post-Doc., 1992–1993

Appointments

- Professor (2002–present), Assoc. Professor (1998–2002), Asst. Professor (1995–98), Asst. Professor Research (1993-95), Dept. of Chem. Eng. & Mat. Sci., Wayne State University.
- Co-Director, Sustainable Engineering Graduate Certificate Prog., Col. of Eng., Wayne State University, 2008–present.

Publications

Five Selected Publications Most Relevant to the Proposed Project

1. Liu, Z. and Y. L. Huang, "Sustainability Enhancement under Uncertainty: A Monte Carlo Based Simulation and System Optimization Method," special issue on Sustainability Science and Engineering (Y. Huang, H. Cabezas, Ed.), *Clean Tech. & Env. Pol.*, (already online accessible) 2015.
2. Uttarwar, R. and Y. Huang, "Nanoparticle Emission Characterization and Management in Nanocoating Material Spray Operation," *ACS Sustainable Chemistry and Eng*., **2**(1), 95-105, 2014.
3. Liu, Z. and Y. Huang, "Sustainable Distributed Biodiesel Manufacturing under Uncertainty: An Interval-Parameter-Programming-Based Approach," *Chem. Eng. Sci.*, **93**, 429-444, 2013.
4. Liu, Z. and Y. Huang, "Technology Evaluation and Decision Making for Sustainability Enhancement of Industrial Systems under Uncertainty," *AIChE J.*, **58**(6), 1841-1852, 2012.
5. Zhang, K., H. Lou, and Y. Huang, "Sustainability under Severe Uncertainty: A Probability Bounds Analysis Based Approach", in *Treatise on Sustainability Science and Engineering*, Jawahir, I. S., S. Sikdar, and Y. Huang (Eds.), Springer, 2013.

Five Other Significant Publications

6. Jayswal, A., X. Li, A. Zanwar, H. Lou, and Y. Huang, "A Sustainability Root Cause Analysis Methodology and Its Application," *Comp. & Chem. Eng.*, **35**(12), 2786-2798, 2011.
7. Piluso, C., J. Huang, Z. Liu, and Y. Huang, "Sustainability Assessment of Industrial Systems under Uncertainty: A Fuzzy-Logic-Based Approach to Short-to-Mid-Term Predictions," *Ind. & Eng. Chem. Res.,* **49**(18), 8633-8643, 2010.
8. Othman, M., J. Repke, G. Wozny, and Y. Huang, "A Modular Approach to Sustainability Assessment and Decision Support in Chemical Process Design," *Ind. & Eng. Chem. Res.*, **49**, 7870-7881, 2010.
9. Xiao J. and Y. Huang, "Technology Integration for Sustainable Manufacturing: An Applied Study on Integrated Profitable Pollution Prevention in Surface Finishing Systems," *Ind. & Eng. Chem. Res.*, **51**, 11434-11444, 2012.
10. Zhang, K., H. H. Lou, and Y. Huang, "Greenhouse Gas Emission Reduction via Advanced Heat Integration Techniques", in *Handbook of Climate Change Mitigation*, W. Chen, J. Seiner, T. Suzuki, M. Lackner (eds.), Chapter 21 (pp. 710-748), Springer, 2012.

Synergistic Activities

1. Project Director, NSF RCN-SEES: Smart Manufacturing Advances in Research and Technology (SMART) Coordination Network (2012–16), involving 21 domestic and foreign universities and 11 national organizations and university research centers/institutes.

2. Leadership Roles in Professional Societies: (i) AIChE: Sustainable Engineering Forum: Tech. Advisor (2011-15); Int'l Committee Chair (2010-11); Forum Chair (2008–09); Nomination Chair (2007); Membership Chair (2003-05); Founding Chair, Sustainable Engineering for Chemical Engineers (SEChE) Committee, (2012-); Chair, Process Research and Innovation, Process Development Div., AIChE, 2003-2005; (ii) ACS: Chair, Green Chemistry and Green Engineering Subdivision, I&EC., 2010; (iii) AESF Foundation: Member, Board of Trustees; Chair, Scholarship Board, 2007-present.

3. Chair/Co-Chair/Co-Organizer of Sustainability and Process/Product System Engineering Conferences: (i) NSF Workshop on Sustainable Manufacturing Research, Arlington, VA, 2015; (ii) U.S. NSF-China NSF Workshop on Sustainable Manufacturing, Wuhan, China, 2014; (iii) the 1st to 4th Int'l Congresses on Sustainability Sci. & Eng., in the U.S., 2009, 2011, and 2013 and 2015; (iv) the 1st to 4th Int'l Conferences on Sustainable Chem. Product and Process Eng. in China, 2007, 2010, 2013, and 2016; (v) 58 other international and national conferences, and symposiums and their plenary and technical sessions, 1997-present.

4. Member, Editorial Board, *ACS Sustainable Chemistry and Engineering*, 2012-present, *Clean Technologies and Environmental Policy*, 2007–present; *J. of Nano Energy and Power Research*, 2010–present; *Chinese J. of Chemical Engineering*, 2011-present, etc.; Guest Editor for *ACS SCE, I&ECR, CTEP,* and *Chi. J. ChE,* and Journal Referee for 48 journals.

5. Plenary/Keynote Speeches on Sustainability: PSE2015/ESCAPE25, Copenhagen, Denmark, May 31-June 4, 2015; RENESENG Workshop, Copenhagen, Denmark, May 27-31, 2015; 4th ICOSSE, Balatonfured, Hungary, May 26-29, 2015; SUR/FIN Conf., Cleveland, June 9-11, 2014; 4th Int'l Forum on Sustainable Manufacturing, Lexington, KY, Sept. 12, 2014; Smart Manufacturing and Green Chemistry Workshop, Gaithersburg, MD, June 16-17, 2014; 3rd Int'l. Conf. on Sustainable Chemical Product and Process Eng., Dalian, China, May 27-31, 2013; 2nd World Cong. on Sustainability Eng., Pittsburgh, PA, Oct. 29, 2012; AIChE Annual Nat'l Mtg., Nov. 7-12, 2010; Keynote Speech on Industrial Sustainability, SUR/FIN Conf., Grand Rapids, MI, June 13-17, 2010;. The UNESCO Int'l Workshop on Eng. Education for Sustainable Development, Beijing, China, Oct. 31-Nov. 2, 2006; 7th World Cong. on Recovery, Recycling, and Reintegration, Beijing, China, Sept. 25-29, 2005; and many others.

Collaborators & Other Affiliations

- Collaborators and Co-Editors: T. Edgar (U Texas - Austin), M. El-Halwagi (TAMU), M. Eden (Auburn U.), C. Davidson (Syracuse U.), S. Sikdar (EPA), H. Cabezas (EPA), J. Leazer (EPA), H. Yee (DuPont), C. Piluso (BASF), M. Mehta (NCMS), H. Matthew (Wayne State U.), G. Wozny (Tech. U. Berlin), Y. Qian (SCUT, China), X. Peng (DLUT, China), R. Gani (Tech. U. Denmark), Q. Jin (Waseda U., Japan), A. Azapagic (U. Manchester, UK). (Total: 17)

- Dissertation Advisor/Post-doc Advisor: L. T. Fan (Kansas State U.) / T. F. Edgar (U. Texas-Austin). (Total: Two)

- Graduate Advisees / Post-docs: (i) Graduated Ph.D.'s: R. Uttarwar (Intel), C. Piluso (BASF), K. Uygun (Harvard U.), H. Lou (Lamar U.), T. Girgis (Metalsa), Z. Liu (SABIC), J. Xiao (Suzhou U., China), Q. Yan (GM), X. Luo (Ford), Q. Zhou (GE), K. Luo (Pfizer), J. Li (CWT), Y. Yang (ABB), Y. Rhee (Lucky Eng. Corp., Korea); (ii) 6 postdoctoral researchers and (iii) 15 M.S.' (names omitted). (Total: 14)

BIOGRAPHY: H. V. Jagadish

Professional Preparation
- Indian Institute of Technology, Delhi - Electrical Engineering - B. Tech, May 1981.
- Stanford University - Electrical Engineering - M.S., Jun. 1983.
- Stanford University - Electrical Engineering - Ph.D., Dec. 1985.

Appointments
- Bernard A Galler Collegiate Professor of Elec. Engg. and Computer Science, University of Michigan, 2009-present.
- Member of the Executive Committee, Center for Computational Medicine and Biology, and Bioinformatics Program, 2003-present.
- Professor, Dept. of Elec. Engg. and Computer Science, University of Michigan, 1999-present.
- Professor, Dept. of Computer Science, University of Illinois, 1998-1999.
- Head of the Database Research Dept., AT&T Labs, 1996-1998.
- Member of Technical Staff at AT&T Bell Labs 1985-1995.

- Member of the Board, CRA, since 2009.
- Founding Editor-in-Chief, *Proc. VLDB Endowment*, 2008-2014.
- Keynote speaker at ACM SIGMOD Conference, 2007.
- Trustee of the VLDB Foundation, 2004-2009.
- Fellow of the ACM, 2003.
- Associate Editor, *ACM Transactions on Database Systems*, 1992-1995.
- Associate Editor, *IEEE Transactions on Knowledge and Data Engg.*, 2002-2005.
- Associate Editor, *Distributed and Parallel Database Systems*, since 1999.
- Program Chair, Intl Symposium on Molecular Biology, 2005.
- Program Chair, ACM SIGMOD Intl. Conf. Mgmt. of Data, 1996.
- Program Vice Chair, IEEE Intl. Conf. Data Engineering, 1995 and 2000.
- Program Chair, Intl. Conf. Parallel and Dist. Info. Syst., 1991.
- Publications Chair, ACM SIGMOD Intl. Conf. Mgmt. of Data, 1990.

- 200 papers in journals and major conferences.
- 37 United States patents.

Five Related Products
1. H. V. Jagadish, Johannes Gehrke, Alexandros Labrinidis, Yannis Papakonstantinou, Jignesh M. Patel, Raghu Ramakrishnan, Cyrus Shahabi, "Big data and its technical challenges," *Commun. ACM*, vol. 57, no. 7, pp. 86–94, July 2014.
2. H.V. Jagadish, "Big Data and Science: Myths and Reality," *Big Data Research*, to appear 2015. doi:10.1016/j.bdr.2015
3. Cheng Long, Raymond Chi-Wing Wong, H. V. Jagadish, "Trajectory Simplification: On Minimizing the Direction-based Error," *PVLDB* Vol. 8, no. 1, pp. 49–60, 2014.
4. Jing Zhang, H. V. Jagadish, "Revision Provenance in Text Documents of Asynchronous Collaboration," *Proc. IEEE Intl. Conf. Data Engineering*, Brisbane, Australia, pp. 889-900, April 2013.
5. Li Qian, Michael Cafarella, H. V. Jagadish, "Sample-Driven Schema Mapping," *Proc. ACM-SIGMOD Int'l Conference on the Management of Data*, Scottsdale, AZ, pp. 73–84, May 2012.

Five Other Significant Products

1. Fei Li, H. V. Jagadish, "Constructing an Interactive Natural Language Interface for Relational Databases," *PVLDB* Vol. 8, no. 1, pp. 73–84, 2014.
2. Fei Li, Tianyin Pan, H. V. Jagadish, "Schema-Free SQL," *Proc. ACM-SIGMOD Int'l Conference on the Management of Data*, pp. 1051–1062, June 2014.
3. Cong Yu and H. V. Jagadish, "Schema Summarization," *Proc. 31st Intl. Conf. Very Large Databases*, Seoul, Korea, pp. 319–330, Sep. 2006.
4. Li Qian, Kristen Lefevre, and H. V. Jagadish, "CRIUS: User-Friendly Database Design," *Proc. VLDB Endowment*, Vol. 4, no. 2, pp. 81–92, 2010.
5. Bin Liu, Laura Chiticariu, Vivian Chu, H. V. Jagadish, and Fred Reiss, "Automatic Rule Refinement for Information Extraction," *Proc. VLDB Endowment*, Vol. 3, no. 1, pp. 588–597, 2010.

Synergistic Activities

- Member of Provost's Learning Analytics Taskforce, Univ. of Michigan, 2013-2015.
- Member of a small multidisciplinary working group that developed and launched a new undergraduate major in "Informatics" at the Univ. of Michigan, including Mathematics, Statistics, Computer Science, and selected application domains. 2006-2011.
- Member, program committee, multi-agency workshop on information integration. Oct 2006.
- Organized an NSF-NIH workshop on data management for molecular and cellular biology – the workshop was well attended and resulted in an influential report. Feb. 2003.

Graduate Advisor (PhD Thesis): Thomas Kailath (Stanford U.).

Thesis Advisees (15 in all): Shurug Al-Khalifa (King Saud U), Adriane Chapman (Mitre), Neamat El-Tazi (U. Cairo), Magesh Jayapandian (IBM), Yunyao Li (IBM), Bin Liu (NEC), Aranb Nandi (Ohio State U.) Andrew Nierman (U. Puget Sound), Stelios Paparizos (Microsoft), Eric Qian (Facebook), Anna Shevardian (IBM), Nuwee Wiwatwattana (Thai Dept. of Environment), Yuqing Wu (Indiana U.), Cong Yu (Google), Jing Zhang (Twitter)

Collaborators at U. Mich (Total: 15): Brian Athey, F. Chip Brosius, Chuck Burant, Eva Feldman, Alla Karnovsky, Mathias Kretzler, George Michailidis, Vijay Nair, Gil Omenn, Drago Radev, Maureen Sartor, Satinder Singh, V. Glenn Tarcea, Toby Teorey, Hao Zhou, Ji Zhu.

Collaborators Elsewhere (Total: 29): Chee Yong Chang (NUS), Calbe Cao (HKUST), Lei Chen (HKUST), Laura Chiti- cariu (IBM), Vivian Chu (IBM), Dan Fabbri (Vanderbilt U.), Mark Flood (U Maryland), Rajasekar Krishna- murthy (IBM), Albert Kyle (U. Maryland), Nick Koudas (U. Toronto), Laks V. S. Lakshmanan (UBC), Kristen LeFevre (Google), Cheng Long (HKUST), Beng-Chin Ooi (NUS), Jignesh Patel (U. Wisconsin), Louiqa Raschid (U. Maryland), Fred Reiss (IBM), Heng-Tao Shen (U. Queensland), Divesh Srivastava (AT&T), David States (U. Houston), Kian-Lee Tan (NUS), Anthony Tung (NUS), Shivakumar Vaithyanathan (IBM) Raymond Wong (HKUST), Huahai Yang (IBM), Jason Zhang (HKUST), Rui Zhang (U. Melbourne), Zhenjie Zhang (NUS), Aoying Zhou (Fudan U.)

Biographical Sketch - Diego Klabjan

Professor, Department of Industrial Engineering and Management Sciences
Director, Master of Science in Analytics
http://www.klabjan.dynresmanagement.com

A. PROFESSIONAL PREPARATION

College/University	Major	Degree & Year	
University of Ljubljana	Applied Mathematics	BS	1994
Georgia Institute of Technology	Algorithms, Combinatorics, and Optimization	Ph.D.	1999

B. ACADEMIC/PROFESSIONAL APPOINTMENTS

2012-present   Professor, Northwestern University, Department of Industrial Engineering and Management Sciences
2010-present   Founding Director, Master of Science in Analytics, Northwestern University
2007-2012:   Associate Professor, Northwestern University, Department of Industrial Engineering and Management Science
2006-2007:   Associate Professor, University of Illinois at Urbana-Champaign, Department of Civil and Environmental Engineering
2005-2006:   Visiting Professor, MIT, Department of Civil and Environmental Engineering
1999-2005:   Tenure-track Assistant Professor, University of Illinois at Urbana-Champaign, Department of Mechanical and Industrial Engineering

C. PUBLICATIONS
Publications Most Closely Related to Proposal

➢ A. Drachen, D. Klabjan, M. Yancey, D. Chu, J. Maguire, Y. Wang. Skill-Based Differences in Spatio-Temporal Team Behavior in Defense of the Ancients 2. 6th IEEE Consumer Electronics Society Games, Entertainment, Media Conference, Toronto, 2014
➢ E. Ko, D. Klabjan. Semantic Properties of Customer Sentiment in Tweets. The 28th IEEE International Conference on Advanced Information Networking and Applications. Victoria, Canada, 2014.
➢ D. Conway and D. Klabjan (2012), Innovation Patterns and Big Data, Forthcoming in Big Data and Business Analytics, Taylor and Francis. Editor J. Liebowitz.
➢ Y.W. Park and D. Klabjan (2015). Optimization via Clustering in Machine Learning.
➢ B. Wang and D. Klabjan (2015). Time-Dependent Topic Analysis with Endogenous and Exogenous Processes.

Other Significant Publications

➢ Y.W. Park and D. Klabjan (2013), Subset Selection for Multiple Regression via Optimization.
➢ Y. Jiang, D. Klabjan, and L. Williams (2012), Algorithms for Generalized Cluster-wise Linear Regression.
➢ A. Drachen, J. Riley, S. Baskin, D. Klabjan (2014), Going Out of Business: Auction House Behavior in the Massively Multi-Player Online Game Glitch. To appear in Entertainment Computing.
➢ J. Han, H. Gonzalez, X. Li, and Diego Klabjan (2006), "Warehousing and Mining Massive RFID Data Sets," Proceedings of the International Conference on Advanced Data Mining and Applications, Xi'An, China.
➢ H. Gonzalez, J. Han, H. Cheng, X. Li, D. Klabjan and T. Wu, Modeling Massive RFID Datasets: A Gateway-Based Movement-Graph Approach. IEEE Transactions on Knowledge and Data Engineering 22 (2010) 90-104.

D. SYNERGISTIC ACTIVITIES

➢ The seminal work on database modeling and querying of databases from RFID data streams has been cited more than 200 times.

- ➢ Co-chair of a big data conference in San Jose, June 2014. Expected more than 400 attendees.
- ➢ Frequent speaker at conferences (scholarly, business, and conventions)
- ➢ Taught a course on IBM Watson – students prototyped solutions with Watson (co-taught with Professor Lawrence Birnbaum)

E. COLLABORATORS AND OTHER AFFILIATIONS
Collaborators

- ➢ Patrick Bless (Intel), Knowledge Management and Text Mining.
- ➢ Anders Drachen (Northeastern University), Game Analytics.
- ➢ Bernardo Almada-Lobo (University of Porto, Portugal), Multi-item Production Scheduling and Sequencing.
- ➢ Jorge Arinez (General Motors), Renewable Portfolio Section.
- ➢ Placid Ferreira (University of Illinois at Urbana Champaign), Real-time production scheduling in the cloud.
- ➢ Shiv Kapoor (University of Illinois at Urbana Champaign), Real-time production scheduling in the cloud.
- ➢ Several collaborators at Northwestern University (EECS, Mechanical Engineering, Medicine, Kellogg, Economics)
- ➢ Total of 10 collaborators in the last 5 years.

Graduate and Postdoctoral Advisors:
Ellis Johnson (Georgia Institute of Technology)
George Nemhauser (Georgia Institute of Technology)

Thesis Advisor and Postgraduate Scholar Sponsors:

- ➢ Currently advising 10 Ph.D. students
  - o Area of machine learning, text analytics, deep learning
- ➢ Graduated Students with PhD: Young Park, Timothy Sweda, Yue Geng, Yan Jiang, Paul Pei, Bill Pun (Northwestern University). Chiwon Kim (MIT), Anupam Seth and Sergey Shebalov (University of Illinois at Urbana-Champaign)
  Total Number of Graduate Students Advised: 9
- ➢ Postgraduate Scholars: Dong Zhang, Conrado Borraz, Nicholas Chang, Panitan Kewcharoenwong, Jun Ma, Suriya Ruangpattana, Sang-Ho Shim, Dengfeng Yang (Northwestern University)
  Total Number of Postdoctoral Scholars Sponsored: 8

Wolfgang Kliemann – Biosketch

(a) Professional Preparation
1967-1970	Freie Universität Berlin, Germany, Sociology
1970-1974	Universität Bielefeld, Germany, Mathematics, Diplom, 1974
1976-1980	Universität Bremen, Germany, Mathematics, Dr. rer. nat., 1980

(b) Appointments
2014-	Associate Vice President for Research, Iowa State University
2008-2013	Chair, Department of Mathematics, Iowa State University
2001-2005	Associate Vice Provost for Research, Iowa State University
2000-2001	Associate Dean for Research, College of Liberal Arts and Sciences, Iowa State University
1999	Associate Chair - Graduate Studies, Department of Mathematics, Iowa State University
1992-present	Professor, Department of Mathematics, Iowa State University

(c) Publications
Closely related to this project

Colonius, F. and W. Kliemann, *Dynamical Systems and Linear Algebra*, American Mathematical Society, Graduate Studies in Mathematics, Vol. 158, Providence, 2014, 284 pp.

Verdejo, H., L.S. Vargas, and W. Kliemann, *Linear Stability via Lyapunov Exponents in Electrical Power Systems*, IEEE Latin America Transactions 11 (2013), 1333-1338.

Verdejo, H., L.S. Vargas, and W. Kliemann, *Stability Indices for Randomly Perturbed Power Systems*, Applied Mathematics and Computation 231 (2014), 386-394.

Verdejo, H., W. Kliemann, L.S. Vargas, *Application of linear stability via Lyapunov exponents in high dimensional electrical power systems*, International Journal of Electrical Power and Energy Systems 64 (2015), 1141-1146

Ayala, J. and W. Kliemann, *Topological dynamics of flows and semiflows associated with graphs*, available at arXiv:1501.07509v1

Select other publications

Verdejo, H., C. Becker, W. Kliemann, L.S. Vargas, *Stability Region and Radius in Electric Power Systems under Sustained Random Perturbations*, to appear in International Journal of Electrical Power and Energy Systems.

Fink, A.M., R.K. Miller, and W. Kliemann (eds.), *Delay and Differential Equations*, World Scientific, Singapore, 1992, 166 pp.

Kliemann, W. and N.S. Namachchivaya (eds.), *Nonlinear Dynamics and Stochastic Mechanics*, CRC Press, Boca Raton, 1995, 530 pp.

Kliemann, W., W.F. Langford, and N.S. Namachchivaya (eds.), *Nonlinear Dynamics and Stochastic Mechanics*, AMS Press, Fields Institute Communication Vol. 9, 1996, 238 pp.

Colonius, F. and W. Kliemann, *The Dynamics of Control*, Birkhäuser, Boston, 2000, 629 pp.

(d) Synergistic activities
- Research Advancement: The Office of the Vice President for Research has responsibility for advancing the research mission at Iowa State University (ISU), and particularly focuses on

interdisciplinary research opportunities that involve scholars from multiple disciplines and colleges. As part of this mission, I lead the Data Driven Science Initiative (DDSI) at ISU, which involves participation from all colleges and the VPs for extension and outreach and for economic development and business engagement. DDSI program components include a seed and team development program for data driven science, education (data science as a field, certificate and minor programs, continuing education), engagement (integration of research and education with external projects), research community development, and computational infrastructure for big data.

- As faculty member and chair: I was involved in education and outreach engagement activities as a faculty member and chair of the Department of Mathematics at Iowa State University, including as member of the Iowa State University Diversity Council; co-organizer of the ISU REU and graduate student summer school (NSF funding); member of the statewide Mathematics Leadership Team, Iowa Department of Education (since 2010); member of the statewide Smarter Balanced Advisory Group, Iowa Board of Regents, (since 2012); member of the STEM Hub Advisory Group for the North-Central Iowa Region, The Governor's STEM Initiative (since 2012); member of the National Smarter Balanced Consortium Mathematics Review Team, member (since 2013); leader of Precalculus group of the APLU Personalized Learning Consortium (2013 – 2014). In the last four years I have delivered over 10 invited presentations on mathematics education and community college to college transition issues.

- University honors: W. Kliemann was awarded the Iowa State University Teaching Excellence Award (1990), the Iowa State University College of Liberal Arts and Sciences Award for Excellence in Research (1998), an Iowa State University Honors Program Recognition for Contributions Made to the Program (1998). He was named Iowa State University College of Liberal Arts and Sciences Master Teacher (1999) and received the State of Iowa Board of Regents Award for Faculty Excellence (2000). He was awarded the 'Friend of Mathematics' prize by the Iowa Council of Teachers of Mathematics in 2013.

(e) Collaborators (outside of Iowa State University) and other affiliations
Collaborators and co-editors, past 48 months (Total: 11)
V. Ayala (Universidad Catolica del Norte, Antofagasta, Chile), A. Carriquiry (Iowa State University, Ames, Iowa), F. Colonius (Universität Augsburg, Germany), Ale Jan Homburg (KdV Institute for Mathematics, University of Amsterdam, The Netherlands), K.R. Rajagopal (Texas A&M University, College Station TX), L.A.B. San Martin (Universidad Estadual de Campinas, Brazil), R. Triggiani (University of Virginia, Charlottesville VA), L. Vargas (Universidad de Chile, Santiago, Chile), V. Vittal (Arizona State University, Tempe AZ), H. Verdejo (Universidad de Santiago de Chile, Chile), J. Ayala (Chile)
Graduate Advisor (Total: One)
L. Arnold, Universität Bremen, Bremen, Germany
Thesis Advisor and Postgraduate Scholar Sponsor, past 5 years
Ph.D. Students (Total: Four)
Wen Li (Stat., 2009), Efrain Cruz (Math., 2009, Chile), Humberto Verdejo (E.E., 2013, Chile), Kim Ayers (Math, 2015)
Postdoctoral Scholars (Total: Three)
Efrain Cruz, Humberto Verdejo, Xi Zhu

Total number of collaborators and co-editors: 21
Total number of graduate advisors and postdoctoral sponsors: 1
Total number of graduate students advised: 17
Total number of post-doctoral scholars sponsored: 6

Biographical Sketch: Jun Li

(a) Professional Preparation
- Tsinghua University, China   Industrial Engineering and Operations Research
  B.E. (with honors)   2007
- The Wharton School, University of Pennsylvania   Operations and Information Management   PhD.   2012

(b) Appointments
- 2012 – present Assistant Professor, Technology and Operations, University of Michigan, Stephen M. Ross School of Business, Ann Arbor, MI

(c) Publication (5 relevant)
  1. Jun Li, Nelson Granados, Serguei Netessine. 2014. "Are Consumers Strategic? Structural Estimation from the Air Travel Industry." *Management Science*, 60(9) *Lead article.* 2114-2137,
     http://pubsonline.informs.org/doi/abs/10.1287/mnsc.2013.1860.
     - Finalist, Management Science Best Paper in Operations Management 2012-2014

(d) Synergistic Activities
  1. Winner of *2015 INFORMS Revenue Management and Pricing Practice Award*. Developed field experiments, consumer demand estimation, and a competition-based dynamic pricing algorithm implemented by a leading international online retailer.
  2. Developed a high-dimensional methodology to derive competition network from consumer click-stream data while correcting for simultaneity biases. Working paper: Jun Li, Serguei Netessine. 2015. "Who Are My Competitors? An Empirical Analysis of the Hospitality Industry."
  3. Constructed a multi-tier supply network in the high tech industry involving 4536 global firms and 13,496 supplier-buyer relationships, and developed metrics for supply network risks. Working paper: Yixin Wang, Jun Li, Ravi Anupindi. 2015. "Risky Suppliers or Risky Supply Chains? An Empirical Analysis of Subtier Network Structure in The High Tech Industry."
  4. Developed a structural estimation procedure to measure hospital quality correcting for patient risks and selection bias simultaneously, and empirically quantify the level of informational, behavioral and economic barriers that lead to patient suboptimal choices of health providers. Working paper: Guihua Wang, Jun Li, Wallace Hopp. 2015. "Why Do Patients Make Suboptimal Choices? An Empirical Analysis of Mitral Valve Surgeries."
  5. Recipient of *Management Science Distinguished Service Award*, 2013, and *Manufacturing & Service Operations Management Meritorious Service Award*, 2013. NSF ad-hoc reviewer.

(e) Collaborators and Other Affiliations

Collaborators and Co-Editors; Hyun-Soo Ahn, University of Michigan; Ravi Anupindi, University of Michigan; Kate Ashley, University of California, Berkeley; Chaitanya Bandi, Northwestern University; Steve Bolling, University of Michigan; Gerard Cachon, University

of Pennsylvania; Frank Fazzalari, University of Michigan; Pnina Feldman, University of California, Berkeley; Marshall Fisher, University of Pennsylvania; Santiago Galino, Dartmouth; Nelson Granados, Pepperdine University; Wallace Hopp, University of Michigan; Sergei Koulayev, Consumer Financial Protection Bureau; Antonio Moreno, Northwestern University; Serguei Netessine, INSEAD; Anyan Qi, University of Texas; Ioannis Stamatopoulos, Northwestern University; Yixin Wang, University of Michigan; Guihua Wang, University of Michigan; Galit Yom-Tov, Technion - Israel Institute of Technology; Dennis Zhang, Northwestern University (22 total)

Graduate Advisors and Postdoctoral Sponsors: Serguei Netessine, INSEAD; Gerard Cachon, University of Pennsylvania. (2 total)

Thesis Advisor and Postgraduate-Scholar Sponsor: Yixin Wang, University of Michigan; Guihua Wang, University of Michigan. (2 total)

Dr. Bertram Ludäscher, Professor
Graduate School of Library & Information Sciences (GSLIS)
& National Center for Supercomputing Applications (NCSA)
& Department of Computer Science (CS)
University of Illinois at Urbana-Champaign (UIUC)   ludaesch@illinois.edu

Education and Training.

Universität Karlsruhe (K.I.T.), Germany; Computer Science	M.S. (*Dipl.-Inform.*), 1992	
Universität Freiburg, Germany; Computer Science	Ph.D. (*Dr. rer. nat.),* 1998	

Research and Professional Experience.

2015-present	Director, Center for Informatics Research in Science & Scholarship (CIRSS), GSLIS
2014-present	Professor, Graduate School of Library & Information Sciences (GSLIS), UIUC
2009-2014	Professor, Dept. of Computer Science & Genome Center, UC Davis
2004-2009	Associate Professor, Dept. of Computer Science & Genome Center, UC Davis
2002-2004	Adj. Asst. Professor, Dept. of Computer Science & Engineering, UC San Diego
2000-2004	Asst. Research Scientist (from 2004: Assoc. Research Scientist), SDSC, UC San Diego
2000-2001	Lecturer, Dept. of Computer Science & Engineering, UC San Diego
1998-2000	Visiting Project Scientist, San Diego Supercomputer Center (SDSC), UC San Diego
1993-1998	Research Scientist (BAT IIa, C1) Databases & Inf. Systems, U Freiburg, Germany

Selected Publications [1]

1. **Ludäscher** B, Altintas I, Berkley C, Higgins D, Jaeger E, Jones M, Lee EA, Tao J, Zhao Y, (2006). Scientific workflow management and the Kepler system. *Concurrency and Computation: Practice and Experience*, 18(10): 1039-1065.
2. **Ludäscher** B, Bowers S, McPhillips T. (2009). Scientific Workflows. In: Özsu MT, Liu L (eds.), *Encyclopedia of Database Systems*. Springer.
3. Song, T., Köhler, S., **Ludäscher**, B., *et al.* (2014). Towards Automated Design, Analysis and Optimization of Declarative Curation Workflows. *Intl. Journal of Digital Curation*, 9(2), 111-122.
4. Kintigh K, Altschul J, Kinzig A, Limp WF, Michener W, Sabloff J, Hackett E, Kohler T, **Ludäscher** B, Clifford AL (2015). Cultural Dynamics, Deep Time, and Data: Planning Cyberinfrastructure Investments for Archaeology. *Advances in Archaeological Practice* 3(1):1-15.
5. McPhillips, T., Song, T., ... & **Ludäscher**, B. (2015). YesWorkflow: A User-Oriented, Language-Independent Tool for Recovering Workflow Information from Scripts. *Intl. Journal of Digital Curation*, to appear. arXiv preprint arXiv:1502.02403.

Other Significant Publications:

1. Zinn, D., Bowers, S., McPhillips, T., & **Ludäscher**, B. (2009). X-CSR: dataflow optimization for distributed XML process pipelines. IEEE *25th Intl. Conf. on Data Engineering* (ICDE)
2. Dey, S. C., Riddle, S., & **Ludäscher**, B. (2013). Provenance Analyzer: Exploring Provenance Semantics with Logic Rules. In *Intl. Workshop on Theory and Practice of Provenance* (TaPP).
3. Morris, R. A., Dou, L., Hanken, J., Kelly, M., Lowery, D. B., **Ludäscher**, B., & Morris, P. J. (2013). Semantic Annotation of Mutable Data. *PloS ONE*, 8(11), e76093.
4. Bowers S, McPhillips T, **Ludäscher** B (2012): Declarative Rules for Inferring Fine-Grained Data Provenance from Scientific Workflow Execution Traces. *4th IPAW*. 82-96
5. Bowers S, McPhillips T, Riddle S, Anand M, **Ludäscher** B, (2008) Kepler/pPOD: Scientific Workflow and Provenance Support for Assembling the Tree of Life. *IPAW*, LNCS 5272, Springer.

Synergistic Activities.

• **Co-Founder**: Kepler Scientific Workflow Project, a cross-project collaboration initially linking NSF/SEEK, SciDAC/SDM, and other projects; now member of the Kepler Leadership Team

• **Editorships**: Guest Editor: Concurrency and Computation: Practice and Experience, Wiley, Special Issue on First Provenance Challenge, 2007; Guest Editor, IEEE Transaction on Automation Science and Engineering, Special Issue on Scientific Workflow Management and Applications, 2008

• **Chairmanships** (selected): Intl.Conf. on Scientific and Statistical Database Management (SSDBM'08: Hong Kong, SSDBM'10: Heidelberg), Deputy Vice Chair: E* Applications, World Wide Web Conf. (WWW'06), Edinburgh; Organizer: ProvenanceWeek'14: 5th Intl. Provenance and Annotation Workshop (IPAW) and 6th USENIX Workshop on the Theory & Practice of Provenance (TaPP), Cologne, 2014.

• **Program Committees:** Intl. Conf. on Very Large Data Bases (VLDB'05,06,08) · Intl. Workshop on Data Integration in the Life Sciences (DILS'04–07) · IEEE Intl. Conf. on Data Engineering (ICDE'02,04,06–08) · Intl. Conf. on e-Science and Grid Computing (eScience'2007) · Intl. Workshop on Workflows in Support of Large-Scale Science (WORKS'06,07) · Intl. Workshop on the Web and Databases (WebDB'00,02,05) · Intl. Conf. on Ontologies, DataBases, and Applications of Semantics (ODBASE'05) ·ACM Intl. Conf. on Management of Data (SIGMOD'04) · IEEE Intl. Conf. on Conceptual Modeling (ER'04) · Intl. Conf. on Web Services (ICWS'04) · 2nd Intl. Semantic Web Conf. (ISWC'03) ·Semantic Web Technologies for Searching and Retrieving Scientific Data (SCISW'03) ·World Wide Web Conf. (WWW'01,04,06) · ACM SAC Track on Web Technologies and Applications (SAC'03) · Intl. Conf. on Extending Database Technology (EDBT'00,02) · Intl. Workshop on Data Integration over the Web (DIWeb@CAiSE'02) · Intl. Workshop on Databases, Documents, Information Fusion (DBFusion'02) · Intl. Workshop on the WWW and Conceptual Modeling (WCM'00)

Collaborators and Co-editors (Total:51): Altintas I, SDSC; Anand M, SDSC; Barreto, R., ORNL; Baru C, SDSC; Beach J, KU ; Berkley C, UCSB; Bowers S, U Gonzaga; C., Silva, Utah; Cheney J, U Edinburgh; Chin G, PNL; Choudhary, A., NWU; Critchlow T, PNL; Cummings, J., CalTech; Davidson S, U Penn; De Roure, D., U Southampton, UK; Deelman, E., USC; Deutsch A, UCSD; Freire J, U Utah; Gertz M, U Heidelberg; Goble C, U Manchester; Gupta A, UCSD; Hamann B, UCD; Jones. M, UCSB; Kamath, C., LLNL; Klasky S, ORNL; Lacroix, J., ASU; Lee E, UCB; Mamoulis N, Hongkong U; McPhillips T, UCD; Michener W, UNM; Moreau L, U Southampton; Nambiar U, IBM Research; Ngu A, Texas State; Podhorszki N, ORNL; Rueda C, MBARI; Samatova, N.,NCSU; Schildhauer M: UCSB; Schuchardt K, PNL; Shoshani A, LBL; Silva C, U Utah; Tao J, UCSB; Thau D, UCD; Vouk M, NCSU; Weske M, U Potsdam; Zinn D, UCD

Graduate Advisors and Postdoctoral Sponsors (Total: five)

Ph.D. Advisor: Prof. Dr. Georg Lausen, Databases & Information Systems, U Freiburg, Germany; M.S. Advisor: Prof. Dr. Peter H. Schmitt, Inst. für Logik, Komplexität & Deduktionssysteme, U Karlsruhe, Germany; Postdoctoral sponsors: Dr. Reagan Moore, SDSC/UCSD; Dr. Chaitan Baru, SDSC/UCSD;

Thesis Advisor and Postgraduate-Scholar Sponsor (Total: 33): **2015-13**: Y. Cao, V. Cuevas, (postdocs), S Dey, P. Kianmajd, S Köhler, A Sarkar, M Chen, Shizhuo Yu, T. Song (PhD students), **2015-13 2010-12** Lei Dou (postdoc), M. Wang, (MS student) **2009-10**: M Anand, D Thau, D Zinn (PhDs), S Gulati (MS), **2008-10**: U Yildiz (postdoc), **2006/7:** N Podhorszki, U Nambiar (postdocs), **2006**: A Chen, **2005**: T Wong (MS) **2003/4**: A Nash (PhD), Xi C. Sheng , H Gupta, Chien-Yi Hou (MS), Laurea D Pasinato, U of Padua, Italy; **2002**: P Mukhopadhyay (PhD student), S Bharath (MS UCSD); **2001**: M E Kurul, S Tambawala (MS), V Crescenzi (PhD U Roma 3); **2000**: P Nguyen, P Velikhov, K Munroe (MS); **1998**: U Hamann (MS, U Freiburg, Germany)

Sanjay Kumar Madria
Professor and Associate Chair for Research and Site Director, NSF I/UCRC Center Net-Centric Software and Systems
Computer Science Department, Missouri University of Science and Technology
(Formerly, University of Missouri-Rolla), Rolla, MO – 65409
Tel. 573-341-4856, Fax. 573-341-4501

Professional Preparation

Indian Institute of Technology; New Delhi, India; Computer Science, Ph.D., 1995
Indian Institute of Technology, New Delhi, India; Mathematics & Comp. Science, MS 1987
University of Delhi, India, Mathematics, BS (Hons.), 1985

Appointments

2014- Cont. – Professor and Associate Chair for Research, Missouri University of Science and Technology, Rolla, MO 65409
2000-2012 - Assistant, Associate and Full Professor, Missouri University of Science and Technology, Rolla, MO 65409
1999-2000 - Visiting Assistant Professor, Department of Computer Science, Purdue University, West Lafayette, IN-47907

Products (from 68 Journal, 137 Conference Publications and 12 book chapters)

Five Products Closely Related to Proposed Project

1. Nayot Poolsappasit and Sanjay K Madria, A Secure Data Aggregation based Trust Management Approach for Dealing with Untrustworthy Motes in Sensor Network, in 40th IEEE International Conference on Parallel Processing (ICPP 2011), Taiwan.
2. Bharath K. Samanthula, Yousef Elmehdwi, Gerry Howser, and Sanjay Madria, A Secure Data Sharing and Query Processing Framework via Federation of Cloud Computing, in Information System Journal, 2013.
3. Raghul Mukund, Sanjay Madria and Mark Linderman, Efficient Integrity Verification of Replicated Data in Cloud using Homomorphic Encryption, accepted, in Distributed and Parallel Databases, Springer, 2014.
4. Tommy Szalapski and Sanjay K Madria, "On Compressing Data in Wireless Sensor Networks for Energy Efficiency and Real Time Delivery", in Distributed and Parallel Databases, 2012.
5. Sanjay Madria, Vimal Kumar and Rashmi Dalvi, Sensor Cloud: A Cloud of Virtual Sensors, in IEEE Software Special -Issue on Next Generation Mobile Computing, 2014.

Five Other Significant Products

1. Vimal Kumar, Joshua McCarville-Schueths, Sanjay K Madria, A Test-bed for Secure Hierarchical Data Aggregation in Wireless Sensor Networks, in proceedings of 7th IEEE International Conference on Mobile Ad-hoc and Sensor Systems (IEEE MASS 2010), Nov 2010, USA.
2. Biswajit Panja and Sanjay Madria, Node Security in Hierarchical Sensor Networks: Function versus Key Splitting, International Journal of Distributed Sensor Networks, pp. 531 – 556, Vol. 5, issue 5, 2009
3. Takahiro Hara and Sanjay Madria, Consistency Management Strategies for Data Replication in Mobile Ad Hoc Networks, in IEEE Transactions on Mobile Computing, 2009.

4. Santhosh Muthyapu, Sanjay Kumar Madria and Mark Linderman, 'PrEServD - Privacy Ensured Service Discovery in Mobile Peer-to-Peer Networks', in proceedings of 29th IEEE Intl Symposium on Reliable Distributed Systems (SRDS10), Nov 2010.

5. Anirban Mondal, Sanjay Kumar Madria and Masaru Kitsuregawa, E-ARL: An Economic incentive scheme for Adaptive Revenue-Load-based dynamic replication of data in Mobile-P2P networks, in Distributed and Parallel Databases, 2010.

Synergetic Activities
Associate Editor of Journals: Distributed and Parallel Database, Pervasove and Mobile Computing
PC Co-chair: IEEE Intl Conference on Mobile Data Management (MDM), 2015, USA
General Co-chair: IEEE Intl Symposium on Reliable Distributed Systems (SRDS12)
Steering Committee Member: IEEE SRDS, IEEE MDM
Panelist: NSF, Korea, Hong Kong Research Council, NSERC (Canada), and Swedish Research Council

Recent Collaborators (4): T. Hara (Osaka U., Japan), Masaru Kitsuregawa (University of Tokyo), Mukesh Mohania (IBM, India), Ouri Wolfson (UIC, USA)

Graduate Advisor (1)
Ph.D.: Professor S. N. Maheshwari, Indian Institute of Technology, New Delhi.

Advisor
Graduated PhD (10): Ming-Yi Shih, Jian Yin, Biswajit Panja, Julia Albath, Waraporn Viyanon, Roy Cabaniss, Venkata Nerella Suhas, Vimal kumar, Tommy Szalapski and Brijesh Kashyap

Graduated MS Thesis (29): Malik Tubaishat, M. Baseer, Yan Chen, Deja Francis, G. Pathak, Bipin S., T. Kuriean, A. Tripathi, Sathya Sundaram, Anura Rable, Muthu Narayanan, Anil Kalkaria, A. Rathore, Jana Eindhal Narasimhalu, Nikhil Bhardawaj, Anil Jade, Santhosh Muthyapu, Prabhu Angajala, Srinivasa Vulli, Swetha Surapaneni, Hemanth Meka, Lekshmi Manian Chidambaram, Makarand Bhonsle, Raghul Mukundan, R. Chaitnya, Rashmi Dalvi, Shashank Kumar, Kiran Kumar Puran and Amarander Reddy

Previous Postdoc: Nayot Poolsappasit (2010-2012), now working at Oxygen Cloud.

Current PhD (8): Amartya Sen, Katrina Ward (Women), Dough McGeehan, MD Azharul Islam, Nilesh Padhariya**,** Dali Ismail (African American), San Yeung, Levi Mallott

Current MS (1): Lakshmi Monangi

BIOGRAPHICAL SKETCH
ROBERT H. MCDONALD
Associate Librarian
Associate Dean for Library Technologies
Deputy Director Data to Insight Center
rhmcdona@indiana.edu | Indiana University

A. Professional Preparation

University of Georgia	Athens, GA	Music Composition	B.Mus.	1993
University of Georgia	Athens, GA	Music Composition	M.Mus.	1996
University of South Carolina	Columbia, SC	Library and Information Science	MLIS	1998

B. Appointments

2012-Present	Director of Kuali OLE Community Development, Indiana University, Bloomington, IN.
2012-Present	Deputy Director Data to Insight Center-Pervasive Technology Institute, Indiana University, Bloomington, IN
2008-Present	Associate Dean for Library Technologies and Associate Librarian, Indiana University Libraries, Indiana University, Bloomington, IN.
2009-2012	Executive Director Kuali OLE, Indiana University, Bloomington, IN.
2009-2012	Associate Director Data to Insight Center-Pervasive Technology Institute, Indiana University, Bloomington, IN
2006-2008	Director of Strategic Data Alliances, Production Systems Division, Digital Preservation Initiatives Group, San Diego Supercomputer Center (SDSC), University of California San Diego, La Jolla, CA.
2004-2006	Associate Director of Libraries for Technology & Research and University Librarian, Division of Library Technology & Research, Florida State University Libraries, Tallahassee, FL.
2002-2004	Assistant Director of Libraries and Associate University Librarian, Division of Library Technology, Florida State University Libraries, Tallahassee, FL.
2002-2003	Interim Head Communications/Publications Department, Florida State University Libraries, Tallahassee, FL.
2002-2003	Head Media Center and Assistant University Librarian, Florida State University Libraries, Tallahassee, FL.
1999-2002	Information Technology & Digital Projects Librarian and Assistant University Librarian, Auburn University Libraries, Auburn, AL.

C. Products

i. Most Closely Related

1. Elag, M., P. Kumar, M. Hesdstrom, J. Myers, B. Plale, L. Marini, R.H. McDonald, *Characterization of Emergent Data Networks Among Long-Tail Data*. AGU General Assembly Proceedings v 1 (2014/12): 8.
2. Plale, B., R.H. McDonald, K. Chandrasekar, I. Kouper, S. Konkiel, M.L. Hedstrom, J. Myers, P. Kumar. *SEAD Virtual Archive: Building a Federation of Institutional Repositories for Long-Term Data Preservation in Sustainability Science*. International Journal of Digital Curation 8(2) 172-80. (2013). doi:10.2218/ijdc.v8i2.281. http://www.ijdc.net/index.php/ijdc/article/view/8.2.172
3. Plale, B., R. H. McDonald, Y. Sun, I. Kouper, R. Cobine, J.S Downie, B. S. Namachchivaya, J. Unsworth, *HathiTrust Research Center: Computational Access for Digital Humanities and Beyond*, Proceedings of the 13th ACM/IEEE-CS Joint Conference on Digital Libraries, July 22-26, 2013, Indianapolis, IN
4. McDonald, R.H. and T.O. Walters. *Restoring Trust Relationships within Collaborative Digital Preservation Federations*. Proceedings of the 4th International Conference on Open Repositories. May

18, 2009, Atlanta, GA.

5. Berman, F., R.H. McDonald, B.E.C. Schottlaender, and A. Kozbial (2007). *The Need to Formalize Trust Relationships in Digital Repositories*. *Educause Review 43(3) (May/June 2008): 10–11.*

ii. Other Significant Products

1. Winkler, M., R.H. McDonald, *Kuali OLE: A Community Collaboration in Software for and by Libraries. Information Standards Quarterly* (ISQ) 24(4) 33-38 (2012). http://www.niso.org/publications/isq/2012/v24no4/winkler/

2. Jordan, C., R.H. McDonald, D. Minor, and A. Kozbial. *Cyberinfrastructure Collaboration for Distributed Digital Preservation. Proceedings of the 4th IEEE International Conference on eScience.* Dec. 10-12, 2008, Indianapolis, IN.

3. Jordan, C., A. Kozbial, D. Minor, and R.H. McDonald. *Encouraging Cyberinfrastructure Collaboration for Digital Preservation. Proceedings of the 5th International Conference on Preservation of Digital Objects (iPRES)*. September 29-30, 2008, London, UK.

4. Walters, T.O. and Robert H. McDonald. *Creating Trust Relationships for Distributed Digital Preservation Federations. Proceedings of the 5th International Conference on Preservation of Digital Objects (iPRES).* September 29-30, 2008, London, UK.

5. McDonald, Robert H. and Chuck Thomas. *The Case for Standardized Reporting and Assessment Requirements for Institutional Repositories*. *Journal of Electronic Resources Librarianship* 20:2 p101.

D. Synergistic Activities

1. *Program Committee,* 2nd Workshop on Sustainable Software for Science: Practice and Experiences (WSSSPE2), SC14 (The International Conference for High Performance Computing, Networking, Storage, and Analysis), 2014
2. *Program Steering Committee Member:* HathiTrust Digital Library, 2014-Present
3. *Technical Advisory Board Member:* Digital Public Library of America, 2012-Present
4. *Steering Committee:* VIVO Researcher Profiles Software Project, 2012-Present
5. *Enabling digital humanities research:* HathiTrust Research Center co-founder and Executive Committee Member, 2011 – present

E. Collaborators and Other Affiliations (18)

Collaborators and Co-Editors

Erez Lieberman Aiden (Baylor University)   Carlen Ruschoff (U Maryland)

Katy Borner (Indiana University)   Sandy Payette (U Michigan)

Tim Cole (UIUC)   Atul Prakash (U Michigan)

Angela Courtney (Indiana University)   Beth Namachchivaya Sandore (UIUC)

Mike Conlon (U Florida)   Benjamin M. Schmidt (Northeastern University)

J. Stephen Downie (UIUC)   Molly Tamarkin (KAUST)

Harriett Green (UIUC)   Mike Winkler (U Penn)

Margaret Hedstrom (U Michigan)   Maurice York (U Michigan)

Jim Myers (U Michigan)   Ann Zimmerman (U Michigan)

Graduate Advisors and Postdoctoral Sponsors (3)
Bob Williams (U South Carolina-retired), Graduate Advisor
Lewis Nielsen (Oberlin College), Graduate Advisor
Roger Vogel (University of Georgia), Graduate Advisor

Biographical Sketch

Eric M. Meslin

(a) Professional Preparation

York University, Toronto Ontario Canada	B.A	Philosophy	1983
Georgetown University/Kennedy Institute of Ethics, Washington, DC	M.A	Philosophy/Bioethics	1985
Georgetown University/Kennedy Institute of Ethics, Washington, DC	Ph.D.	Philosophy/Bioethics	1989

(b) Appointments (since 2001)

2014-	Professor of Bioethics and Law (Secondary Appointment), IU McKinney School of Law, Indiana University, Indianapolis
2010-	Co-Director, Indiana University Center for Law, Ethics, and Applied Research in Health Information (CLEAR), 2010 – Present
2008-	Director, Bioethics and Subject Advocacy Program, Indiana Clinical and Translational Science Institute
2007-	Associate Dean for Bioethics, Indiana University School of Medicine, Indianapolis
2002-	Professor of Medical and Molecular Genetics, School of Medicine, Indiana University
2001-	Professor of Medicine (with tenure), School of Medicine, Indiana University
2001-2007	Assistant Dean for Bioethics, School of Medicine, Indiana University
2001-	Professor of Philosophy, Indiana University School of Liberal Arts, at Indiana University-Purdue University at Indianapolis
2001	Director, Indiana University Center for Bioethics

(c) Publications

(i) Related Publications

Kaye J, Meslin EM, Knoppers BK, et al . ELSI 2.0: A New International Collaboratory for Genomics and Society Research. *Science* 2012; 36:673-4

Evans JP, Meslin EM, Marteau TM, Caulfield T. Deflating the Genomic Bubble. *Science* 2011 331: 861-62

Meslin EM, Schwartz PH. How Bioethics Principles Can Aid Design of Electronic Health Records to Accommodate Patient Granular Control *J Gen Intern Med* 2014; 30 (Suppl 1):S3–6 DOI: 10.1007/s11606-014-3062-z

Meslin EM, Blasimme A, Cambon-Thomsen A, Mapping the Science Policy 'Valley of Death' *Clinical and Translational Medicine* 2013, 2:14. DOI: 10.1186/10.1186/2001-1326-2-14

Allen J, Hulman D, Meslin EM, Stanley F. Privacy protectionism and health information: is there any redress for harms to health? *Journal of Law and Medicine* 2013; 21: 473-485

(ii) Significant Publications

<u>Meslin EM</u>**,** Cho MK, Research Ethics in the Era of Personalized Medicine: Updating Science's Contract with Society *Public Health Genomics* 2010;13:378-384 (DOI: 10.1159/000319473)

Kosseim P, Dove ES, Baggaley C, <u>Meslin EM</u>, Harris J, Cate FH, Kaye J, Knoppers BM. Data-Sharing Models for International Genomics Research: Lessons Drawn from the Commercial Context *Genome Biology* 2014; 15: 430 doi: 10.1186/s13059-014-0430-2

Schwartz, PH, <u>Meslin EM</u> The Ethics of Information: Absolute Risk Reduction and Patient Understanding of Screening. *Journal of General Internal Medicine* Med DOI: 10.1007/s11606-008-0616-y

Tierney WM, Alpert SA, Byrket A, Caine K, Leventhal JC, <u>Meslin EM</u>, Schwartz, PH. Provider Responses to Patients Controlling Access to their Electronic Health Records: A Prospective Cohort Study in Primary Care *J Gen Intern Med* 2014; 30(Suppl 1): S31-37.
DOI: 10.1007/s11606-014-3053-0

(d) Synergistic Activities

2015	Chair, External Review Committee, UK Biobank Ethics and Governance Council,
2013-	Regulatory and Ethics Working Group Task Team, Global Alliance for Genomics and Health
2012-	Science and Industry Advisory Committee, Genome Canada
1998-2001	Executive Director, US National Bioethics Advisory Commission, Bethesda, MD,
1996-98	Program Director, ELSI Research Program, National Human Genome Research Institute, National Institutes of Health, Bethesda, MD,

(e) Collaborators & Other Affiliations

(i) Collaborators and Co-Editors (14 total)

Graeme Laurie, University of Edinburgh; Richard Ashcroft, Queens University London (co-editors, Bioethics and Law Series, Cambridge University Press)
David Ayuku, Moi University, Kenya
Michael Burgess, University of British Columbia, Canada
Anne Cambon-Thomsen, INSERM & Université Paul Sabatier Toulouse, France
Timothy Caulfield, University of Alberta, Edmonton
Donald Chalmers, University of Tasmania
Ken Goodman, University of Miami Medical School
Jennifer R Harris, Norwegian Institute of Public Health, Oslo, Norway
Nils Hoppe, Leibniz Universitaet, Hannover, Germany
Eric T. Juengst**,** University of North Carolina at Chapel Hill
Kazuto Kato Osaka University, Japan
Jane Kaye, HeLEX, Department of Public Health, University of Oxford, Oxford UK
Bartha M. Knoppers, McGill University, Montreal, Canada.

Gregory Ernest Monaco

(a) Professional Preparation
Northwestern University, Speech, Bachelor of Science, 1973
Kansas State University, Cognitive Psychology, Master of Science, 1976
Kansas State University, Cognitive Psychology, Doctor of Philosophy, 1978

(b) Appointments
Director for Research & Cyberinfrastructure Initiatives, Great Plains Network, 2010 - Present
Executive Director, Great Plains Network Consortium, 2006 – 2010
Director for Research and Education, Great Plains Network, 2002 - 2006
Program Director/Computer Scientist, National Science Foundation, Directorate for Computer and
     Information Science and Engineering (NSF-CISE), 2001 - 2003
Research Collaboration Coordinator, Great Plains Network, 2000 - 2001
President and CEO, Monaco & Associates Incorporated, 1986 - Present
Psychologist II, Kansas Neurological Institute, State of Kansas, 1984 - 1986
Data Processing Training Specialist II, Employment Security Systems Institute, State of Kansas,
     1981 - 1984
Adjunct Assistant Professor, Washburn University, Psychology, 1980 - 1989
Research Associate, University of Kansas, Bureau of Child Research, 1978 - 1980

(c) Publications

i) Related Publications
Almes, G.T., et al. (2012) What's next for campus cyberinfrastructure? *Educause Advanced
     Core Technologies Initiative.*
Apon, A., Monaco, G.E., Springer, G.K. (2006) The Great Plains Network Middleware Testbed.
     Scalable Computing: Practice and Experience (SCPE).
Monaco, G.E. (2005) International Collaboration in a Flat World. Presented at the Past, Present &
     Future of the Internet, Phase II of the World Summit on the Information Society, Tunisia.
Monaco, G.E., & McMullen, D.F. Regional Cyberinfrastructure as a Bridge Between Campus and
     National CI presented at the March, 2010, Campus Bridging Workshop at Indiana University
Monaco, G.E., & Soudi, A. (2004) An Emerging Transcontinental Interdisciplinary Research and
     Education Collaboration in Human Language Technology. *Proceedings of the Fourth Annual
     Conference on Language Resources and Evaluation*.

ii) Other Significant Publications
Harris, R.J., & Monaco, G.E. (1978) The psychology of pragmatic implication: Information
     processing between the lines. Journal of Experimental Psychology: General. 107: 1-22.
Monaco, G.E., & Harris, R.J. (1978) The influence of narrative structure on memory. Bulletin of
     the Psychonomic Society. 11: 393-396.
Monaco, G.E., & Smith, J.P. (1991) *Challenging Issues for Teaching People with Developmental
     Disabilities and Mental Retardation: 8 Staff Training Videos and Instruction Guides*. Monaco
     & Associates Incorporated.
Monaco, G.E., & Tomiser, J.M. (1999) *EC3 Human Service Software*. Monaco & Associates
     Incorporated. (Revised & updated 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2008)
Tomiser, J.M., Hollis, J.H., & Monaco, G.E. (1983) Haptic attention and visual transfer by mentally
     retarded and nonretarded individuals. American Journal of Mental Deficiency. 87: 448-455,
     1983

(d) Synergistic Activities

Member, Steering Committee, Internet2 Broadening the Reach Project, funded by the National Science Foundation

Member, Steering Committee, Clemson University's Advanced Cyberinfrastructure - Research and Educational Facilitation: Campus-Based Computational Research Support, funded by the National Science Foundation

Member, Educause Center for Analysis and Research, Campus Cyberinfrastructure Working Group

As Program Director at the National Science Foundation managed Advanced Networking Infrastructure Program ($7 million over three years), co-managed Strategic Technologies for the Internet Program ($20 million over two years), and managed a total portfolio of $58 million in awards.

(e) Collaborators & Other Affiliations

Collaborators and Co-Editors.   Total = 19
Stanley Ahalt, Renaissance Computing Institute
Joni Blake, Greater Western Library Alliance
James Bottum, Clemson University
Chip Byers, MOREnet
Cortney Buffington, KanREN
James Deaton, OneNet
Claude Garelik, South Dakota Board of Regents
Gwendolyn Huntoon, Keystone Initiative (KINBER)
Timothy Lance, NYSERNET, Inc.
Jennifer Leasure, The Quilt
Rick McMullen, Internet2
Deep Medhi, University of Missouri – Kansas City
Henry Neeman, University of Oklahoma
Abdelhadi Soudi, Ecole Nationale de l'Industrie Minerale, Rabat, Morocco
Gordon Springer, University of Missouri
David Swanson, University of Nebraska-Lincoln
John Towns, XSEDE
Walter Weir, University of Nebraska-Lincoln
Taieb Znati, University of Pittsburgh

Graduate Advisor and Thesis Advisor
Prof. Richard J. Harris, Kansas State University

Klara Nahrstedt
Department of Computer Science
University of Illinois at Urbana-Champaign
201 North Goodwin Ave.,
Urbana, IL 61801
Email: klara@illinois.edu

a. Professional Preparation

Humboldt University von Berlin, Berlin, Germany Mathematics   A.B., 1984
Humboldt University von Berlin, Berlin, Germany Numerical Analysis   Diplom, 1985
University of Pennsylvania, Philadelphia, Computer Science   Ph.D., 1995

b. Appointments

Director of Coordinated Science Laboratory, University of Illinois at Urbana-Champaign, 2/2015-present
Acting Director of Coordinated Science Laboratory, University of Illinois at Urbana-Champaign, 8/2013-1/2015
Raph and Catherine Fisher Professor, Department of Computer Science, University of Illinois at Urbana-Champaign, 9/2005-present
Visiting Professor, Technical University Darmstadt, Germany, 6/2010-12/2010, 6/2013-7/2013, 6/2014
Associate Professor, Department of Computer Science, University of Illinois at Urbana-Champaign, 9/2001-8/2005
Visiting Associate Professor, Technical University Darmstadt, Germany, 4/2004-6/2004
Visiting Associate Professor, EECS, University of California, Berkeley, California, 9/2003-12/2003
Assistant Professor, Computer Science Department, University of Illinois at Urbana-Champaign, 9/1995-8/2001
Research Assistant, Computer and Information Science Department, University of Pennsylvania, 9/1990-8/1995
Researcher, Institute for Informatik, Berlin, Germany, 1/1987-12/1989
System Programmer, Computer Center of Ministry for Agriculture, Berlin, Germany, 9/1985-12/1986

c.i. 5 Products

1. Md Ahsan Arefin, Raol Rivas, Klara Nahrstedt, "OSM: Prioritized evolutionary QoS optimization for interactive 3D teleimmersion", **ACM Transactions on Multimedia Computing, Communications and Applications**, Vol. 10, Issue 1s, Pages 12, 2014.
2. Ahsan Arefin, Raoul Rivas, Rehana Tabassum, Klara Nahrstedt, "OpenSession: SDN-based Cross-layer Multi-stream Management Protocol for 3D Teleimmersion", **IEEE 21st International Conference on Network Protocols (ICNP 2013)**, Gottingen, Germany, October 2013.
3. Debessay Kassa, Klara Nahrstedt, "SCDA: SLA-aware Cloud Datacenter Architecture for Efficient Content Storage and Retrieval**", IEEE International Conference on Cloud Computing (CLOUD 2014),** Anchorage, Alaska, June, 2014
4. Rini Kaushik, Klara Nahrstedt, "A Cyber-Physical, Data-Centric Cooling Energy Costs Reduction Approach for Big Data Analytics Cloud", **ACM Supercomputing (SC'12),** Salt Lake City, 10-16, November 2012.
5. Md Ahsan Arefin, Khurshid Ahmed, Matthew Caesar, Klara Nahrstedt, "Scaling Data-Plane Logging in Large Scale Networks", I**EEE MILCOM 2011**

c.ii. 5 Other Products

1. Ahsan Arefin, Klara Nahrstedt, "Multi-stream Frame Rate Guarantee using Cross-Layer Synergy", **IEEE ICNP 2013**, Gottingen, Germany, October 2013.
2. Arefin Ahsan , Zixia Huang, Klara Nahrstedt, Pooja Agarwal, "4D TeleCast: Towards Large Scale Multi-site and Multi-view Dissemination of 3DTI Content", **IEEE ICDCS 2012**, Makau, China.

3. Klara Nahrstedt, Zhenyu. Yang, Wanmin Wu, Ahsan Arefin, Raol Rivas, " Session Management in 3D Tele-immersive Systems", **International Journal of Multimedia Tools and Applications (MTAP), Springer** , Guest Editors Ramesh Jain, Alberto Del Bimbo, Tat-Seng Chua, Borko Fuhrt, Special Issue on "Hot Topics in Multimedia" , Springer Netherlands, vol. 51, 2011

4. Klara Nahrstedt, Zhenuy Yang, Wanmin Wu, Ahsan Arefin, Raoul Rivas, Zixia Huang, "Quality and Resource Management for Distributed Interactive Multimedia Environments", **International Journal of Multimedia Tools and Applications (MTAP), Springer**, Guest Editors Ramesh Jain, Alberto Del Bimbo, Tat-Seng Chua, Borko Fuhrt, Special Issue on "Survey Papers in Multimedia by World Experts", Springer Netherlands, vol. 51, 2011

5. Jin Liang, Klara Nahrstedt, *"Large-Scale QoS-Aware Service-Oriented Networking with a Clustering-Based Approach"*, **IEEE ICCCN (Int'l Conf. on Computer Communication and Networking),** Honolulu, Hawaii, Aug. 2007

d. Synergistic Activities (up to 5)

1. My accomplishments are in Large Scale Distributed Multimedia Systems and Networks, QoS-aware Resource Management, Software-Defined Networking for Real-Time Multimedia Applications, and Trustworthy Distributed Cyber-Infrastructures for Cyber-Physical Systems (CPS). I have worked on novel real-time resource management, security algorithms and systems such as latency and bandwidth sensitive streaming protocols, real-time authentication protocols for 3D teleimmersive systems, CPS systems, and campus cyber-infrastructures to connect scientific data with cloud computing,

2. CCC member (2014-2017), General Chair of Percom 2009, ACM SIGMM Chair (2007-2013), General Chair of ACM NOSSDAV 2007, General Co-chair for ACM Multimedia 2006; TPC chair of IEEE Percom 2005; Editor in Chief for ACM/Springer Multimedia Systems Journal (2001-2006); AE in IEEE Trans. Information Forensics and Security (2005-2009); AE in ACM Trans. Multimedia (2005-2011); AE in IEEE Trans. Multimedia (2012-present); Co-chair of IEEE International Conference on Network Protocols 2001;

e. Collaborators & Other Affiliations

e.i. Collaborators and Co-Editors (Total:32): P. Bajcsy (NIST), R. Bajcsy (UC Berkeley), D. Bakken (WSU), A. Buchman (TU Darmstadt), R. Campbell (UIUC), G. Dan (KTH), G. Gross (UIUC), C. Gunter (UIUC), C. Hauser (WSU), R. Iyer (UIUC), R. Kravets (UIUC), D. Kotz (Dartmouth), M. Kumar (UTA), M. Muhlhauser (TU Darmstadt), T. Overbye (UIUC), B. Prabhakaran (UT Dallas), W. Sander (UIUC), S. Santini (TU Dresden), P. Sauer (UIUC), A. Scalione (UC Davis), J. Smith (Dartmouth), M. Spong (UT Dallas), R. Steinmetz (TU Darmstadt), R. Thomas (Cornell), S. Uludag (U.Michigan, Flint), K. Wehrle (U. Aachen), M. Winslett (UIUC), N. Aluru (UIUC), D. Nicol (UIUC), J. Rogers (UIUC), B. Cunningham (UIUC), N. Kiyanash (UIUC), G. Gao (UIUC)

e.ii. Graduate and Post Doctoral Advisors (Total: one): Jonathan M. Smith (University of Pennsylvania)

e.iii. Thesis Advisor or Postgraduate-Scholar Sponsor (Total: 42): Kai Chen (Google), Shigang Chen (University of Florida), Hao-hua Chu (Taiwan National University), Yi Cui (Google), Xiaohui Gu (North Caroline State University), Won Jeon (Samsung), Jingwen Jin (Caterpilar), Baochun Li (University of Toronto), King-Shan Lui (Hong-Kong University), Lintian Qiao (Citadel), Sergio Servetto (Cornell University, deseased), Samarth Harish Shah (Microsoft), Jun Wang (Microsoft), Duangdao Wichadakul (Thailand National Laboratory), Li Xiao (Google), Dongyan Xu (Purdue University), Yuan Xue (Vanderbilt University), Bin Yu (Morgan Stanley), Wanghong Yuan (Google), Vanish Talwar (HP), Jin Liang (Google), Zhenuy Yang (Florida International University), William Conner (Google), Wenbo He (McGill University), Long Vu (IBM, New York Heights), Thadpong Pongthawornkamo (Google), Ying Huang (Google), Hoang Ngyuen (Google), Shu Shi (AT&T), Raoul Rivas (Intel), Wanmin Wu (Ricoh), Ahsan Arefin (Microsoft), Zixia Huang (Google), Hongyang Li (UIUC), Debessay Kassa (Neustar), Rini Kaushik (IBM, Almaden), Long Vu (IBM), Haiming Jin (UIUC), Zhenhuan Gao (UIUC), Wenyu Ren (UIUC), Shannon Chen (UIUC), Phuong Nguyen (UIUC).

Total number of graduate students advised: 35 Ph.D. students and 50 Master's students
Total number of postdoctoral scholars sponsored: 3 (R. Hill, J. Wang, Z. Yang)

Caralynn V. Nowinski, M.D.

Professional Preparation

University of Illinois College of Medicine, Chicago, IL	James Scholar	M.D., 2007
UIC Graduate School of Business, Chicago, IL	Honors, Entrepreneurship	M.B.A., 2007
Northwestern University, Evanston, IL	Honors, Human Comms. Sci.	B.S., 1999

Professional Appointments

UI LABS (Lab 1: Digital Manufacturing & Design Innovation Institute; Lab 2: Smart/Sustainable Cities)

Chief Executive Officer	June 2015 - Present
Executive Director & Chief Operating Officer	2014-2015

University of Illinois

Associate Vice President for Innovation & Economic Development	2011-2014

Sikich Investment Banking

Senior Vice President, Healthcare Group	2011
Vice President, Healthcare Group	2010-2011

Arch Development Partners

Principal, Venture Capital	2009-2010
Associate, Venture Capital	2007-2009

Synergistic Activities

Member (Appointed by Governor Rauner), Innovate Illinois	2015 - Present
Executive Board Member, CityWorks Consortium (Smart Cities)	2015 - Present
Executive Committee Member, DMDII Consortium (Manufacturing)	2014 - Present
Member (Appointed by Mayor Emanuel), ChicagoNEXT	2013 - Present
Chicago Council on Global Affairs, Emerging Leaders Program	2012-2014

**Collaborators and Other Affiliates -
None**

VALENTIN PENTCHEV

(a) Professional Preparation

St. Kliment Ohridski University, Sofia, Bulgaria	Informatics & Computer Science	B.S.	1994
St. Kliment Ohridski University, Sofia, Bulgaria	Philology & Linguistics	M.A.	1998
University of Miami, Miami, Florida	Information Systems & Computer Science	B.S. equiv.	2000
Hamilton College, Cedar Rapids, Iowa	Managing Information Systems	B.S.	2003

(b) Appointments

Jan 2015-present	Director of Information Technology, Indiana University Network Science Institute, Indiana University
May 2013- Dec 2014	Director of Information Technology, CODA Energy Holdings, LLC Monrovia, CA
Mar 2011-May 2013	Senior Manager of Information Technology, CODA Automotive, Los Angeles, CA
Jan 2008-Mar 2011	Sr. Network/Server Administrator, University of California Los Angeles
April 2005-Dec 2007	Senior Network Administrator/Senior Consulting Network Analyst, Afiliated Computer Services, Inc., (ACS), Los Angeles, CA
Mar 2003-Mar 2005	Network Consultant/Senior IT Instructor, Westwood College, Los Angeles, CA
Aug 2001-Jul 2003	Network Administrator/IT Instructor, Hamilton College, Cedar Rapids, Iowa
Jan 1999-Aug 2001	MCSE Instructor/Program Director/Senior Network Administrator, Aquarius Institute of Computer Science, Chicago, IL

(c) Products – No publications to report

(d) Synergistic Activities

- Project leader – creation of a secure data enclave to host Web of Science data set
- Led and implemented an entire IT infrastructure from the ground up and assembled a team of professionals for recently founded CODA Energy Storage
- Project leader on development of a Battery Tower Data Gathering infrastructure with local hardware software, central data collection and management as well as customer and engineering web portals
- Personally architected and designed the expansion of CODA Automotive and CODA Energy Storage from a small business in Santa Monica to a multinational conglomerate of more than a dozen offices on 3 continents and multiple US States
- Led the CODA IT Team through mergers and acquisitions, as well as extensions of the core business to include multiple locations in the US, Europe and Asia

(e) Collaborators & Other Affiliations

- *(i) Collaborators and Co-Editors (past 48 months):* 0
- *(ii) Graduate and Postdoctoral Advisors:* 0
- *(iii) Total number of graduate students supervised:* 0

BERNICE A. PESCOSOLIDO

(a) Professional Preparation

University of Rhode Island; Kingston	Sociology/Spanish	B.A.	1974
Yale University; New Haven, Connecticut	Sociology	M.A.	1976
Yale University; New Haven, Connecticut	Sociology	M. Phil.	1977
Yale University; New Haven, Connecticut	Sociology	Ph.D.	1982
Mentored Scientist Award (K01), National Institute of Mental Health			1989-1994
Independent Scientist Award (K02), National Institute of Mental Health			1997-2002
Robert Wood Johnson, Health Policy Scholar			2000-2003
Career Enhancement Award (K18), National Institute on Drug Abuse			2010-2011

(b) Appointments

2006-present	Distinguished Professor, Indiana University
2003-2004	Vice President, American Sociological Association
1998-present	Chancellor's Professor, Indiana University
1990-1998	Associate Professor, Indiana University
1983-1990	Assistant Professor, Indiana University
1981-1983	Lecturer, Indiana University

(c) Products

(i) Products most closely related

Pescosolido, B.A. In Press. "Linking the Social Brain to the Social World through Network Connections." In *Social Neuroscience: Brain, Mind, and Society*. R. Schutt, L.J. Seidman, and M.S. Keshavan, eds. Cambridge, MA: Harvard University Press.

Pescosolido, B.A., S. Olafsdottir, B.L. Perry, O. Sporns, E. Meslin, et al. In Press. "The Social Symbiome Framework: Linking Genes-to-Global cultures in public health using network science." Forthcoming in Z. Neal (ed.), The Handbook of Applied Systems Science. New York: Routledge

Perry, B.L., B.A. Pescosolido. 2015. "Social network activation: The role of health discussion partners in recovery from mental illness." *Social Science & Medicine* 125:116-28.

Perry, B.L. & B.A. Pescosolido. 2012. "Social Network Dynamics and Biographical Disruption: The Case of "First-Timers" with Mental Illness." *American Journal of Sociology* 118(1): 134-175.

Pescosolido, B.A. 2006. Of pride and prejudice: The role of sociology and social networks in integrating the health sciences. *Journal of Health and Social Behavior* 47(September):189-208.

(ii) Other significant products

Pescosolido, B.A., J.K. Martin, S. Olafsdottir, J.S. Long, K. Kafadar, and T.R. Medina. Forthcoming. "The theory of industrial society and cultural schemas: Does the 'cultural myth of public stigma' underlie the WHO Schizophrenia Paradox?" *American Journal of Sociology*

Pescosolido, B.A. and J.K. Martin. Forthcoming. "The Stigma Complex." *Annual Review of Sociology.*

Perry, B.L., B.A. Pescosolido, K. Bucholz, H. Edenberg, J. Kramer, et al. 2013. "Gender-specific gene-environment interaction in alcohol dependence: The impact of daily life events and GABRA2." Behavior Genetics 43(5): 402-414..

Pescosolido, B.A., T.R. Medina, J.K. Martin, J.S. Long. 2013. "The "backbone" of stigma: Identifying the global core of public prejudice associated with mental illness." American Journal of Public Health 103(5): 853-860.

Pescosolido, B.A., B.L. Perry, J.L. Long, J.K. Martin, J.I. Nurnberger, V. Hesselbrock. 2008. Under the influence of genetics: How transdisciplinarity leads us to rethink social pathways to illness. American Journal of Sociology 114 (Suppl.): S171-S201 (Freidson Outstanding Publication Award, ASA, 2009).

(d) Synergistic Activities

- **National Service:** National Academy of Sciences, Standing Committee on the Science of Changing Behavioral Health Social Norms (2014-present); Chair, IRG, Social Psychology and Interpersonal Processes, NIH (2014-present; member, 2011-14); Committee of Visitors, Social , Behavioral and Economics Branch, National Science Foundation (2011); Chair, Psychosocial Workgroup, NGRI Phen-X Toolbox Project, 2010-2011); Editorial Board (of 12 over career): *Network Science* (2012-present); *Journal of Health & Social Behavior*, 2008-2010; *American Sociological Review*, 2006-2008; Overseers' Board, *The General Social Survey* (1997-2001); Minority Fellowship Program Committee, American Sociological Association (1998-2000)

- **Research Director/Co-Directorships:** Indiana University Network Science Institute (IUNI) (2014-present); Indiana Consortium for Mental Health Services Research (1994 – present); Concept I Program in Health and Medicine (1997–present)

- **Innovation in Mentoring, Teaching, and Contributions to the Science of Learning:** Co-Director and Co-Founder, Preparing Future Faculty Program, Department of Sociology (1995-present); Carla B. Howery Award for Developing Teacher-Scholars [inaugural award], American Sociological Association, 2009 (with IU colleague B. Powell); Wilbert Hites Mentoring Award, IU, 2003; Graduate Student Association Outstanding Faculty Mentoring Award, 2002; Mauksch Award for a Career of Distinguished Teaching, ASA, 2006; Pescosolido, Bernice A. and R. Aminzade, eds. 1999. *The Social Worlds of Higher Education: Handbook for Teaching in a New Century.* Pine Forge Press (Division of Sage Publications (currently under revision).

(e) Collaborators & Other Affiliations

(i) Collaborators and Co-Editors (past 48 months; 34 total): Colleen Barry (Johns Hopkins University); Carol Boyer (Rutgers University); Kathleen Bucholz (Washington University in St. Louis); Cynthia Colen (Ohio State University); Howard Edenberg (Indiana University School of Medicine); Emily Fairchild (New College); Alexandra Fickenscher (University of Colorado); Tatiana Foroud (Indiana University); Howard Goldman (University of Maryland); Elizabeth Grauerholz (University of Central Florida); Anthony Grubesic (Temple University); Karen Kafadar (University of Virginia); Laura Koehly (NIH); John Kramer (University of Iowa); Samuel Kuperman (University of Iowa); J. Scott Long (Indiana University); Jack K. Martin (Indiana University); Janet McCabe (Dartmouth University); Emma McGinty (Johns Hopkins University); Douglas Novins (University of Colorado, Denver); John Nurnberger (Indiana University School of Medicine); Tait Medina (Indiana University); Eric Meslin (Indiana University); Sigrun Olafsdottir (Boston University), Brea Perry (Indiana University); Brian Powell (Indiana University); William Pridemore (Georgia Tech University), Anne Rogers (U of Southhampton, UK); Marc Alan Schuckit (University of California, Dan Diego); Anantha Shekhar (Indiana University); Paul Spicer (University of Oklahoma); Olaf Sporns (Indiana University); Alessandro Vespignani (Northeastern University), Matthew Wray (Temple University)

(ii) Graduate and Postdoctoral Advisors (3 total): Kai Erikson (Ph.D. Committee), Yale University; Peggy Thoits (K01 Mentor), Indiana University; David Knoke (K01 Mentor), University of Minnesota; All other advisors are deceased

(iii) Thesis Advisor (chair or co-chair; 19 total): Giovanni Burgos (Adelphi University); Phyllis Dexter (IU School of Nursing); Danielle Fettes (UCSD); Anne Figert* (Loyola University, Chicago); Keri Lubell (Centers for Disease Control); Karen Lutfey* (University of Colorado, Boulder); Jonathan Marks (Winthrop University); Tait Medina (University of Illinois, Chicago); Melissa Milkie (University of Toronto); Janet Myers (U. Washington); Stacy Scherr (consultant, Cincinnati, OH); Sigrun Olafsdottir* (Boston University); Brea Perry* (Indiana University); Abigail Sewell (University of Pennsylvania & Emory University); Alicia Suarez (DePauw University);Timothy Thornton (U of Wisconsin, LaCrosse); Eric Wright* (Georgia State University); Violet Yebei (Moi University, Kenya); Dapha Yeshua-Katz (Ben Gurion University);. [*Best Dissertation National Award Winners] Total number of graduate advisees: ~50

Rob Quick
Open Science Grid Operations Coordinator
Manager Distributed Operational Support and Engineering
Indiana University/Open Science Grid
rquick@iu.edu

Professional Preparation

Indiana University Purdue University   Physics, Mathematics   B.S. 2005
Indianapolis (IUPUI)

Appointments

2012   Software Assurance Marketpalce (SWAMP) – Operations Manager
2007   OSG Operations Coordinator/Manager Grid Technologies – OSG/Indiana
              University
2003-2007   Grid Technologist – Indiana University
2002-2003   Lead Network Operations Analyst – Indiana University
2000-2002   Student Technology Consulting Manager – Indiana University Purdue
              University Indianapolis

Publications

Selected relevant products:

1. The Open Science Grid,Ruth Pordes , Don Petravick , Bill Kramer , Doug Olson ,
   Miron Livny , Alain Roy , Paul Avery , Kent Blackburn , Torre Wenaus , Frank
   Würthwein , Ian Foster , Rob Gardner , Mike Wilde , Alan Blatecky , John McGee
   and Rob Quick , 2007 *J. Phys.: Conf. Ser.* **78**

2. The Open Science Grid Status and Architecture, R Pordes , D Petravick , B Kramer ,
   D Olson , M Livny , A Roy , P Avery , K Blackburn , T Wenaus , F Würthwein , I
   Foster , R Gardner , M Wilde , A Blatecky , J McGee and R Quick , 2008 *J. Phys.:
   Conf. Ser.* **119** 052028

3. New Science on the Open Science Grid, R Pordes , M Altunay , P Avery , A Bejan ,
   K Blackburn , A Blatecky , R Gardner , B Kramer , M Livny , J McGee , M Potekhin ,
   R Quick , D Olson , A Roy , C Sehgal , T Wenaus , M Wilde and F Würthwein 2008
   J. Phys.: Conf. Ser. **125** 012070

4. RSV: OSG Fabric Monitoring and Interoperations with WLCG Monitoring Systems,
   Rob Quick, A Gopu, S Hayashi, 2009 *J Physics Conf. Ser.*

5. GOC-TX: A Reliable Ticket Synchronization Application for the Open Science Grid,
   R Quick, S Hayashi, A Gopu 2011 *J Physics Conf. Ser.* **331** 082013

Other selected products:

1. The Event Notification and Alarm System for the Open Science Grid Operations
   Center, S Hayashi, S Teige, and R Quick 2012 *J Physics Conf. Ser.* **396** 032105

2. Distributed Monitoring Infrastructure for the Worldwide LHC Computing Grid, P Andrade, M Babik, K Bhatt, P Chand, D Collados, V Duggal, P Fuente, S Hayashi, E Imamagic, P Joshi, R Kalmady, U Karnani, V Kumar, W Lapka, R Quick, J Tarragon, S Teige and C Triantafyllidis 2012 *1742-6596* **396** 032002

3. The benefits and challenges of sharing glidein factory operations across nine timezones between OSG and CMS, I Sfiligoi, J M Dost, M Zvada, I Butenas, B Holzman, F Wuerthwein, P Kreuzer, S W Teige, R Quick, J M Hernández and J Flix 2012 *1742-6596* **396** 032103

4. OASIS: A data and software distribution service for the Open Science Grid, B Bockleman, J Caballero Bejar, J De Stefano, J Hover, R Quick and S Teige 2014 *J Physics Conf. Ser.* **513** 032013

Synergistic Activities

1. International Workshop on Autonomic Management of High Performance Grid and Cloud Computing – Program Committee

2. African School of Fundamental Physics and it's Applications – 2012 and 2014 – Lecturer

3. External Advisory Committee – European Grid Infrastructure – 2014 to Present

4. European Grid Initiative Technical Summit – Sept 2011 - Invited Speaker

5. OSG South America Grid School 2010– Invited Instructor

Collaborators & Other Affiliations

Collaborators and Co-Editors (15 total):
Antoni, Torsten (Karlsruhe Institute of Technology)
Avery, Paul (University of Florida)
Babik, Marian (CERN)
Barnett, William (Indiana University)
Baurdick, Lothar (FNAL)
Casey, James (CERN)
Ernst, Michael (BNL)
Field, Laurence (CERN)
Gardner, Robert (University of Chicago)
Hayashi, Soichi (Indiana University)
Livny, Miron (University of Wisconsin)
Luehring, Fredrick (Indiana University)
Pordes, Ruth (FNAL)
Roy, Alain (University of Wisconsin)
Rynge, Mats (University of Southern California – ISI)

Graduate advisors and Postdoctoral Sponsors: n/a

Thesis Advisor and Postgraduate Scholar Sponsor: 0

Total number of graduate students supervised: 0

Daniel A. Reed

2660 Old Capitol Centre   (319) 335-2132
University of Iowa   FAX: (319) 335-2104
Iowa City, Iowa 52242   dan-reed@uiowa.edu

Professional Preparation
Missouri University of Science &Technology Computer Science B.S. (*summa cum laude*), 1978
Purdue University   Computer Science   M.S., 1980
Purdue University   Computer Science   Ph.D., 1983

Appointments
Vice President for Research and Economic Development & Computational Science and Bioinformatics Chair, 2012-
Scalable and Multicore Computing Strategist and Corporate Vice President, Microsoft, 2007-2012
Chancellor's Eminent Professor, University of North Carolina at Chapel Hill, 2004-2007
Director, Renaissance Computing Institute (RENCI), 2004-2007
Director, National Center for Supercomputing Applications (NCSA), 2000-2003
Director, National Computational Science Alliance, 2000-2003
Edward William and Jane Marr Gutgsell Professor, Department of Computer Science,
        University of Illinois at Urbana-Champaign, 2000-2003
Head, Department of Computer Science, University of Illinois at Urbana-Champaign, 1997-2001
Assistant, Associate, and Professor, Department of Computer Science, University of Illinois 1984-2003
Senior Research Scientist, National Center for Supercomputing Applications, 1995-2000
Visiting Scientist, IBM T. J. Watson Research Center, 1990
Assistant Professor, Department of Computer Science, University of North Carolina, 1983-1984

Five Related Products
[1]   D. A. Reed and J. Dongarra, "Exascale Computing and Big Data: The Next Frontier," *Communications of the ACM*, *to appear*

[2]   D. A. Reed, D. B. Gannon and J. R. Larus, "Imagining the Future: Thoughts on Computing," *IEEE Computer*, pp. 39-44, January 2012

[3]   G. Blair, F. Kon, W. Cirne, D. Milojicic, R. Ramakrishnan, D. Reed, and D. Silva, "Perspectives on Cloud Computing: Interviews with Five Leading Scientists from the Cloud Community," *Journal of Internet Services and Applications*, Special Issue on Cloud Computing, Volume 2, No. 1, July 2011.

[4]   K. Venkatesh Vishwanath, A. Greenberg, and D. A. Reed, "Modular Data Centers: How to Design Them?" *Large-scale System and Application Performance Workshop* (LSAP2009), June 2009

[5]   L. Ramakrishnan and D. A. Reed, "Performability Modeling for Scheduling and Fault Tolerance Strategies for Scientific Workflows," *17th International Symposium on High-Performance Distributed Computing*, pp. 23-34, 2008

Five Other Products

[1]   C.-L. Lu and D. A. Reed, "Assessing Fault Sensitivity in MPI Applications," SC04, November 2004 (*best paper award*)

[2]   D. A. Reed, C.-L. Lu, and C. L. Mendes, "Reliability Challenges in Large-Scale Systems," *Future Generation Computer Systems*, Vol. 2, No. 3, pp.292-302, February 2006

[3]   T. Gamblin, B. R. de Supinski, M. Schulz, R. J. Fowler, and D. A. Reed, "Scalable Load-Balance Measurement for SPMD Codes," *SC08*, November 2008

[4]   T. Gamblin, B R. de Supinski, M. Schulz, R. Fowler, D. A. Reed, "Clustering Performance Data Efficiently at Massive Scales," *International Conference on Supercomputing*, June 2010

[5]   J. Dongarra, P. Beckman, T. Moore, P. Aerts, G. Aloisio, J. Andre, D. Barkai, J. Berthou, T. Boku, B. Braunschweig, F. Cappello, B. Bhapman, X. Chi, A. Choudhary, S. Dosanjh, T. Dunning, S. Fiore, A. Geist, B. Gropp, R. Harrison, M. Hereld, M. Heroux, A. Hoisie, K. Hotta, Z. Jin, Y. Ishikawa, F.

Johnson, S. Kale, R. Kenway, D. Keyes, B. Kramer, J. Labarta, A. Lichnewsky, T. Lippert, B. Lucas, B. Maccabe, S. Matsuoka, P. Messina, P. Michielse, B. Mohr, M. Mueller, W. Nagel, H. Nakashmia, M. Papka, D. Reed, M. Sato, E. Seidel, J. Shalf, D. Skinner, M. Snir, T. Sterling, R. Stevens, F. Streitz, B. Sugar, S. Sumimoto, W. Tang, J. Taylor, R. Thakur, A. Trefethen, M. Valero, A. Steen, J. Vetter, P. Williams, R. Wisniewski and K. Yelick (2011). "The International Exascale Software Project Roadmap," *International Journal of High Performance Computing Applications*, 25(3), January 2011

Synergistic Activities

[1] Created a Microsoft-led international partnership with the National Science Foundation, the European Union, Australia, Japan and China to explore use of public cloud infrastructure for computational science and data analytics research

[2] Co-founded of the Computing Research Association's Computing Community Consortium (CCC), whose goal is to catalyze and empower the U.S. computing research community to pursue audacious, high-impact research. CCC was created with funding from the National Science Foundation while I served as chair of the CRA Board

[3] While at Microsoft, assisted in creation of Computing in the Core (CinC), a coalition of associations, corporations, scientific societies, and other non-profits that strive to elevate computer science education to a core academic subject in K-12 education

[4] Congressional testimony and Capitol Hill briefings on many aspects of computing research policy and high-performance computing futures.

[5] National service on many committees and advisory boards, including Center for Minorities and People with Disabilities in Information Technology (2011-), IEEE Seymour Cray and Sidney Fernbach Awards Committee, Chair (2009-2012), TechAmerica Cloud Commission, Commercial Co-Chair (2011), Computing in the Core, Executive Committee (2011-2012), U.S. Federal Communication Commission, Technical Advisory Group (2011-2012), National Academies, Board on Global Science and Technology (2010-2014), President's Council of Advisors on Science and Technology (PCAST) (2006-2008), International Telecommunications Union, CTO Council (2010-2012), DOE Secretary of Energy Advisory Board ad hoc Committee on Exascale Computing (2012-2014), National Academies Committee on Future Directions for NSF Advanced Computing Infrastructure (2013-), ICANN Generic Names Supporting Organization (GNSO) Council (2013-), Texas Advanced Computing Center, Strategic Advisory Board (2013-), Scientific Advisory Committee for the Department of Energy's Systems Biology Knowledgebase (KBase) (2013-)

Collaborators and Co-Editors

A. Choudhary (Northwestern), P. Beckman (Chicago), G. Blair (Lancaster), W. Cirne (Google), J. Dongarra (UTK) , G. Fox (Indiana), D. Gannon, A. Greenberg (Microsoft), J. Larus (EPFL), T. Gamblin (LLNL), R. Giles (BostonU), W. Gropp (Illinois), R. Harrison (SUNY), F. Kon (São Paulo), D. Milojicic (HP Labs), R. Ramakrishnan (Yahoo), D. Silva (TAMU), R. Stevens (ANL), B. R. de Supinski (LLNL), M. Schulz (LLNL). Total count: 19

Graduate Advisor: Herbert D. Schwetman, Purdue University (now at Oracle) (sole advisor)

Thesis Advisor and Postgraduate-Scholar Sponsor

Alex Y.-W. Kwok (unknown), Chong-Kwon Kim (Korea), Alexander J. Spry (Loral), Wittaya Watcharawittayakul (Thailand), Dirk C. Grunwald (Colorado), Allen D. Malony (University of Oregon), Bobby A. A. Nazief (University of Indonesia), David W. Jensen (Pacific Sierra Research), Brian K. Totty (self employed), Tara M. Madhyastha (U. Washington), Celso L. Mendes (UIUC), Christopher L. Elford (Intel),Thomas Kwan (Yahoo), Huseyin Simitci (Microsoft), Nancy Tran (unknown), Mario Medina (Chile), Charng-da Lu (SUNY Buffalo),Emma Buneci (Amazon), Todd Gamblin (LLNL)

Supervised completion of 20 M.S. theses, 19 Ph.D. dissertations, and 8 post-doctoral scholars, none in last five years

Vallabh Sambamurthy

Eli Broad Professor and Chairman,
Department of Accounting and Information Systems
Eli Broad College of Business, The Michigan State University, East Lansing, MI 48824
Telephone: (517) 432-2916, E-mail: **sambamurthy@bus.msu.edu**

Professional Preparation

National Institute of Technology, Tiruchirapalli, India, Mechanical Engineering, Bachelor of Engineering (Honors), May, 1981

Indian Institute of Management, Calcutta, India, Post Graduate Diploma in Management (MBA), April, 1983

Carlson School of Management, University of Minnesota, Management Information Systems, Doctor of Philosophy, June, 1989.

Appointments

Broad College of Business, Michigan State University
- Chairperson, Department of Accounting and Information Systems, October 2012 - present
- Faculty Director, Masters' Program in Business Analytics, 2012 – 2013
- Executive Director, Center for Leadership of the Digital Enterprise (www.bus.msu.edu/clode), 2004-2009.
- Eli Broad Professor, 2002 – present

The Robert H. Smith School of Business, The University of Maryland, Associate Professor, 1999-2002.

College of Business, The Florida State University
- Associate Professor, 1995-1998
- Assistant Professor, 1989-1995.

Voltas, Inc.,
- Regional Sales Manager, Southern India Operations, Bangalore, India, 1984-1985.
- Product Marketing, Corporate Office, Mumbai, India, 1983-1984.

Products

Closely Related to the proposed project

1. N. Saraf, K. Ruckman, and V. Sambamurthy, Market Positioning by Information Technology Vendors through Imitation, **Information Systems Research**, 26(1), March 2015: 100-126.

2. R. Grewal, A. Chakravarthy, and V. Sambamurthy, Information Technology Competencies, Organizational Agility, and Firm Performance: Enabling and Facilitating Roles, **Information Systems Research, 24 (4),** December 2013: 976-997.

3. J. Woodard, N. Ramasubbu, T. Tschang, and V. Sambamurthy, Design Capital and Design Moves: The Logic of Digital Business Strategy, **MIS Quarterly**, Volume 37 (2), June 2013: pp. 537-564.

4. S. Sasidharan, R. Santhanam, D. Brass, and V. Sambamurthy, The Effects of Social Network Structure on Enterprise Systems Success: A Longitudinal Multilevel Analysis, **Information Systems Research**, Volume 23, Number 3, Part 1 of 2, September 2012: 658-678.

5. L. Xue, G. Ray, and V. Sambamurthy, Efficiency or Innovation: How do Industry Environments Moderate the Effects of Firm's IT Asset Portfolios? **MIS Quarterly**, Volume 36, Number 2, June 2012: 509-528.

Other Significant Products

1. One-Ki Lee, Vallabh Sambamurthy, Kai Lim, and K.K. Wei, How does IT Ambidexterity Impact Organizational Agility, **Information Systems Research**, in press.
2. P. Setia, B. Rajagopal, V. Sambamurthy, and R. Calantone, Value Relevance of Peripheral Developer Participation in Open Source Software Development Communities, **Information Systems Research**, Volume 23 (1), March, 2012:144-163.
3. R. Banker, Saby Mitra, and V. Sambamurthy, Digital Platforms in Agricultural Supply Chains in Developing Countries: The Effects of Information Technology on Commodity Prices, **MIS Quarterly,** September 2011, 35(3): 599-611.
4. P. Setia, M. Setia, R. Krishnan, and V. Sambamurthy, Patterns of Enterprise IT Architectures and their Impacts on Hospital Financial Performance, **Journal of AIS (Special Issue on Health Care)**, March 2011, Vol. 12: Issue 3, Article 1.
5. S. Mithas, N. Ramasubbu, and V. Sambamurthy, Information Management Capability and Firm Performance: An Empirical Analysis, **MIS Quarterly**, Volume 35, Number 1, March, 2011: 237-256.

Synergistic Activities

*   Editor-in-Chief, *Information Systems Research*, 2005-2010.
*   Distinguished Fellow, Information Systems Society, INFORMS, 2011.
*   Fellow, Association of Information Systems, 2009

Collaborators and Co-editors (15)
Chakravarthy, A., University of Georgia; Grewal, R., University of North Carolina, Chapel Hill; Hillol, B., Indiana University; Lee, One-ki, University of Massachussetts; Lim, Kai, City University of Hong Kong; Ramasubbu, N., University of Pittsburgh; Ray, G., University of Minnesota; Ruckman, K., Simon Fraser University; Saraf, N., Simon Fraser University
Setia, P., University of Arkansas; Tschang. T., Singapore Management University; Venkatesh, V., University of Arkansas; Wei, KK, City University of Hong Kong; Woodard, J., Singapore Management University; Xue, L, Georgia State University

Graduate Advisors (2)
Gerardine DeSanctis (Duke University) (deceased)
Marshall Scott Pool, University of Illinois, Urbana Champaign

Thesis Advisor (16)
Russell L. Purvis, 1994 (Clemson University); Curtis P. Armstrong, 1995 (Tennessee Technological University); Timothy Kayworth, 1996 (Baylor University); Debabroto Chatterjee, 1997 (University of Georgia); Jorge Perez, 1998 (Kennesaw University); Jon Jasperson, 1998 (Texas A&M University); William Lewis, 1999 (Louisiana Tech University); Detlev Smaltz, 1999 (Ohio State University); Kevin Duffy, 2000 (University of Texas, Arlington); Jarvis Moore, 2000 (University of Memphis); Pankaj Setia, University of Arkansas, 2008 (University of Arkansas); Mahesh Ramamani (Indian Institute of Management, Indore), 2010; Mathew Wimble (University of Michigan, Dearborn) 2011; John Tripp, (Baylor University) 2012; Eun Ju Jung, (George Mason University) 2015; Yu Huang, currently in progress

Andrew J. Saykin, Raymond C. Beeler Professor of Radiology of Imaging Sciences
Center for Neuroimaging, Division of Imaging Sciences, Department of Radiology,
Indiana University School of Medicine, 950 W Walnut St, R2 E124, Indianapolis, IN 46202.
asaykin@iupui.edu; Tel: (317) 278-6947; Fax: (317) 274-1067.

Professional Preparation:

INSTITUTION AND LOCATION	DEGREE	YEAR	FIELD OF STUDY
University of Massachusetts, Amherst	B.A.	1977	Psychology
Hahnemann Medical College, Philadelphia	M.S.	1979	Clinical Psychology
Hahnemann Medical College, Philadelphia	Psy.D.	1982	Clinical Neuropsychology
University of Pennsylvania, Philadelphia	Post-Doc	1982-85	Neuropsychology/Imaging

Appointments:

1985-91	Clinical Director, Neuropsychology, Univ. of Pennsylvania School of Medicine.
1985-92	Assist. Professor of Neuropsychology in Psychiatry, UPENN, School of Medicine.
1992-06	Director of Neuropsychology and of Brain Imaging Lab, Dartmouth Medical School.
1992-02	Associate Professor of Psychiatry and Radiology; Dartmouth Medical School.
2002-06	Professor of Psychiatry, Radiology and Computer Science, Dartmouth College.
2004-06	Director, Neuroimaging Research Center; Co-Dir.Dartmouth Advanced Imaging Ctr.
2006-	Raymond C. Beeler Professor of Radiology, IU School of Medicine, Indianapolis.
2006-	Director, Indiana University Center for Neuroimaging, IU School of Medicine
2006-	Associate Director, Indiana institute for Biomedical Imaging Sciences, Indianapolis.
2006-	Member, IU Cancer Center & Alzheimer's Center; Advisory Board, Alcohol Res. Ctr.
2006-	Member, Stark Neurosciences Research Institute
2007-	Professor, Department of Psychological and Brain Sciences, IU-Bloomington.
2007-	Professor, Departments of Neurology and Psychiatry, IU School of Medicine.
2008-	Professor, Dept. of Medical & Molecular Genetics, IU School of Medicine

Five Products Closely Related to the Proposed Project:

Saykin AJ, Shen L, Xiaohui Yao, Kim S, Nho K, Risacher SL, Ramanan VK, Foroud TM, Faber KM, Sarwar N, Munsie LM, Hu X, Soares HD, Potkin SG, Thompson PM, Kauwe JS, Kaddurah-Daouk R, Green RC, Toga AW, Weiner MW, for the Alzheimer's Disease neuroimaging Initiative. (2015) Genetic Studies of Quantitative MCI and AD Phenotypes in ADNI: Progress, Opportunities, and Plans. Alzheimers Dement., in press.

Yan J, Li T, Wang H, Huang H, Wan J, Nho K, Kim S, Risacher SL, **Saykin AJ**, Shen L, for the ADNI (2015) Cortical surface biomarkers for predicting cognitive outcomes using group L21 norm. Neurobiology of Aging, 36:Suppl 1:S185-93.

Shen L, Thompson PM, Potkin SG, Bertram L, Farrer LA, Foroud TM, Green RC, Hu X, Huentelman MJ, Kim S, Kauwe JS, Li Q, Liu E, Macciardi F, Moore JH, Munsie L, Nho K, Ramanan VK, Risacher SL, Stone DJ, Swaminathan S, Toga AW, Weiner MW, **Saykin AJ**. Genetic analysis of quantitative phenotypes in AD and MCI: imaging, cognition and biomarkers. Brain imaging and behavior. 2014;8(2):183-207.

Wang D, Nie F, Huang H, Yan J, Risacher SL, **Saykin AJ**, Shen L, for the ADNI (2013) Structural brain network constrained neuroimaging marker identification for predicting cognitive functions. IPMI'13: Information Processing in Medical Imaging, Lecture Notes in Computer Science, 7917:536-547.

Cheng H, Wang Y, Sheng J, Sporns O, Kronenberger WG, Mathews VP, Hummer TA, **Saykin AJ** (2012). Optimization of seed density in DTI tractography for structural networks. J Neurosci Methods, 203(1):264-72.

Five Other Significant Products:

Ramanan VK, Risacher SL, Nho K, Kim S, Swaminathan S, Shen L, Foroud TM, Hakonarson H, Huentelman MJ, Aisen PS, Petersen RC, Green RC, Jack CR, Koeppe RA, Jagust WJ, Weiner MW, **Saykin AJ**. APOE and BCHE as modulators of cerebral amyloid deposition: a florbetapir PET genome-wide association study. Molecular psychiatry. 2014;19(3):351-7.

Nho K, Corneveaux JJ, Kim S, Lin H, Risacher SL, Shen L, Swaminathan S, Ramanan VK, Liu Y, Foroud T, Inlow MH, Siniard AL, Reiman RA, Aisen PS, Petersen RC, Green RC, Jack CR, Weiner MW, Baldwin CT, Lunetta K, Farrer LA, Furney SJ, Lovestone S, Simmons A, Mecocci P, Vellas B, Tsolaki M, Kloszewska I, Soininen H, McDonald BC, Farlow MR, Ghetti B, Huentelman MJ, **Saykin AJ**. Whole-exome sequencing and imaging genetics identify functional variants for rate of change in hippocampal volume in mild cognitive impairment. Molecular psychiatry. 2013;18(7):781-7.

Risacher SL, Shen L, West JD, Kim S, McDonald BC, Beckett LA, Harvey DJ, Jack CR, Weiner MW, **Saykin AJ**, and ADNI (2010). Longitudinal MRI atrophy biomarkers: Relationship to conversion in the ADNI cohort. Neurobiology of Aging, 31(8):1401-1418.

Saykin AJ, Shen L, Foroud TM, Potkin SG, Swaminathan S, Kim S, Risacher SL, Nho K, Huentelman MJ, Craig DW, Thompson PM, Stein JL, Moore JH, Farrer LA, Green RC, Bertram L, Jack CR, Weiner MW, and ADNI (2010). ADNI biomarkers as quantitative phenotypes: Genetics core aims, progress, and plans, Alzheimer's and Dementia, 6:265-273.

Shen L, Kim S, Risacher SL, Nho K, Swaminathan S, West JD, Foroud TM, Pankratz ND, Moore JH, Sloan CD, Huentelman MJ, Craig DW, DeChairo BM, Potkin SG, Jack CR, Weiner MW, **Saykin AJ**, and ADNI (2010). Whole genome association study of brain-wide imaging phenotypes for identifying quantitative trait loci in MCI and AD: A study of the ADNI cohort. NeuroImage, 53:1051-1063.

Synergistic Activities (up to five examples)

2005-   Chair, Genetics Working Group, NIA Alzheimer's Disease Neuroimaging Initiative (ADNI)
2007-   co-PI/Executive Committee, NIA Alzheimer's Disease Genetics Consortium (ADGC)
2009-   Leader/PI, Genetics Core, NIA Alzheimer's Disease Neuroimaging Initiative (ADNI)
2006-   Editor-in-Chief, Brain Imaging and Behavior (www.springer.com/journal/11682)
1992-09 Various national and international service positions: Chair, National Institute on Drug Abuse Clinical Neuroscience and Imaging Panel (1997-98); Member, NIH Brain Disorders & Clinical Neuroscience-Panel 6 (renamed to NPAS; 1998-06); Editorial Board of JINS (1999-04), JCEN (2004-06) & Neuropsych Rev (2006-pres); Elected to Board of Directors of the American Board of Clinical Neuropsychology (2002-07); Elected to Board of Governors of the International Neuropsychological Society (2006-09)

Collaborators and Co-Editors (other than those cited on above publications in the past 48 months)(76 total): Martha Shenton (BWH/Harvard), Konstantinos Arfanakis (Illionois Intitute of Technology), Erin Bigler (BYU), John Van Horn (UCLA).

Graduate Advisors and Postdoctoral Sponsors (2 total):
Graduate: Sandra Koffler, Ph.D. Hahnemann Medical College, Philadelphia (now Drexel University) Postdoctoral: Ruben C. Gur Ph.D., University of Pennsylvania, Philadelphia

Thesis Advisor and Postgraduate-Scholar Sponsor (14 total):
PhD students: Susan Conroy (IU), Shannon Risacher (IU), Shanker Swaminathan (IU), Vijay Ramanan (IU), Kelly Holohan (IU), Kacie Deters (IU), Joey Contreras (IU), Emrin Horgusluoglu (IU); Postdocs: Hiram Firpi (IU), Tom Hummer (IU), Sungeun Kim (IU), Kwangsik Nho (IU), Shannon Risacher (IU), Shanker Swaminathan (IU).

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Professional Preparation

- "La Sapienza" Rome University, Italy   Electronics Engineering   **Dr. Eng.** May 1987
- "La Sapienza" Rome University, Italy   Dynamical Systems   **Post-Dr.** Dec 1988

Appointments

- **Full Professor**, Department of Electrical and Computer Engineering, Kansas State University, (July 2013 – present)
- **Core Faculty**, Institute of Computational Comparative Medicine, Kansas State University, (August 2013 – present)
- **Director**, EPICENTER Laboratory, Kansas State University, (2008 – present)
- **Associate Professor (tenured)**, Department of Electrical and Computer Engineering, Kansas State University, Manhattan, KS (2005 – 2013)
- **Research Engineer II**, Georgia Institute of Technology, Atlanta, GA (2000 – 2005)
- **Senior Research Scientist**, Fondazione Ugo Bordoni, Rome, Italy (1987 – 2000)

Products

Most Closely Related Products

1. F. Sahneh, C. Scoglio, "Competitive Epidemic Spreading over Arbitrary Multi-Layer Networks", *Physical Review E*, Vol. 89, No. 6, p. 062817, 2014.
2. S. Pahwa, C. Scoglio, A. Scala "Abruptness of Cascade Failures in Power Grids" *Nature Scientific Reports*, 4, 2014.
3. F. Sahneh, C. Scoglio, F. N. Chowdhury, "Effect of Coupling on the Epidemic Threshold in Interconnected Complex Networks: A Spectral Analysis" *Proceedings of American Control Conference*, Washington DC, 2307-2312, 2013.
4. F. Sahneh, C. Scoglio, P. Van Mieghem, "Generalized Epidemic Mean-Field Model for Spreading Processes over Multi-Layer Complex Networks," *IEEE/ACM Transactions on Networking*, vol. 21, no.5, 1609-1620, 2013.
5. F. Sahneh, F. N. Chowdhury, G. Brase, C. Scoglio "Individual-based Information Dissemination in Multilayer Epidemic Modeling" *Mathematical Modelling of Natural Phenomena*, Cambridge Journals Online, Volume 9, Issue 2, pp 136-152, 2014.

Other Significant Products

1. F. Sahneh, F. Chowdhury, C. Scoglio "On the Existence of a Threshold for Preventive Behavioral Responses to Suppress Epidemic Spreading" *Nature Scientific Reports* 2, 632, 2012.
2. L. Xue, H. M. Scott, L. Cohnstaedt**,** C. Scoglio "A Network-Based Meta-Population Approach to Model Rift Valley Fever Epidemics" *Journal of Theoretical Biology*, Elsevier, Volume 3, Issue 5, Pages 356–366, 2012.
3. L. Xue, L. Cohnstaedt, H. M. Scott, C. Scoglio "A hierarchical network approach for modeling Rift Valley fever epidemics with applications in North America" *PLoS ONE* 8 (5), e62049, 2013.
4. P. Schumm, W. Schumm, C. Scoglio, "Impact of Preventive Behavioral Responses to Epidemics in Rural Regions", *PLoS ONE* 8(3): e59028, 2013.

5. M. Youssef, C. Scoglio, "Mitigation of epidemics in social networks through optimal contact adaptation", *Mathematical Biosciences and Engineering*, Volume 10, No. 4, Pages 1227 - 1251, 2013.

Synergistic Activities
- Chair of the Technical Committee on Healthcare and Medical Systems of the IEEE Control System Society (2015 – present), Member of the Editorial Board of the Computer Networks Journal, Elsevier (2011 – 2014), and PLOS Current: Outbreak (2011 – present).
- TPC co-chair for IFIP Networking 2011, Valencia, Spain., co-chair for the "International Workshop on Robustness of Complex Networks", Delft, The Netherlands, 2010, and Chair of the Workshop "Frontiers in Multi-Scale Computational Modeling for Zoonotic Epidemics", Kansas City (MO), 2011.
- TPC member for many conferences, including IEEE INFOCOM 1998, QofIS 2000, IEEE INFOCOM 2004 – 2007, IEEE ICC 2004, QofIS 2004, Networking 2007, Complex 2009, ICC '09, IWSOS '08, IPOM '08, ITC '11.
- Reviewer for IEEE/ACM Transactions on Networking, IEEE Transactions on Neural Networks, Computer Networks Journal, and conferences such as IEEE INFOCOM 2001, 2002 – 2007, IEEE GLOBECOM 2001 – 2004, IEEE ICC 2001 – 2004, among others.
- "2014 Dean's Award of Excellence" from the College of Engineering, Kansas State University; "2008 Eta Kappa Nu Distinguished Faculty Award" from the Department of Electrical and Computer Engineering at Kansas State University.

Collaborators and Co-Editors (total 31)
Dan Andresen (KSU), B.-Y. Choi (UMKC), F. Chowdhury (NSF), L. Cohnstaedt (KSU-USDA), S. Das (KSU), D. Dell'Orco (Uni. Verona), T. Easton (KSU), K. Garrett (KSU), R. Gehring (KSU), D. Gruenbacher (KSU), W. Hsu (KSU), D. Iacoviello (University of Roma "La Sapienza", Italy), G.Koch (University of Roma "La Sapienza", Italy), R. Kooij (TU Delft, The Netherlands), J. Marzo (University of Girona, Spain), D. Medhi (UMKC), R. Miller (KSU), G. Monaco (KSU), N.A. Monteiro-Riviere (KSU), B. Natarajan (KSU), M. Parchman (MacColl Center), E. K. Park (UMKC/NSF), P. Poggi-Corradini (KSU), J.E. Riviere (KSU), N. Schulz (KSU), W. Schumm (KSU), M. Scott (KSU), J. Sterbenz (KU), D. van der Merwe (KSU), Piet Van Mieghem (Delft).

Advisors (total 2): C. Bruni ("Sapienza" University of Rome), A. Germani (University of L'Aquila).

Advisees (total 17): N. Anand (University of Arkansas), B. McBride (Sandia National Labs), F. Darabi Sahneh (KSU), S. Kubler (Burns & McDonnell), Xin Li (KSU), Y. Li (NetApp), S. Nirkhiwale (University of Florida), S. Pahwa (KSU), S. Roy Chowdhury (University of Minnesota), P. Schumm (USDA), Heman Shakeri (KSU), S. Sutrave, A. Sydney (Raytheon BBN Technologies), N. Tare (Adobe), M. Youssef (Virginia Bioinformatics Institute, Virginia Tech), Haotian Wu (KSU), L. Xue (Tulane University).

Bio Sketch – Lior Shamir

A. Professional Preparation

• Computer Science, B.Sc., Tel Aviv University, 1998
• Comput. Sci. & Eng., Ph.D, Michigan Technological University, Houghton, MI, 2006
• Postdoc, NIH, Baltimore, MD, 2010

B. Appointments

• 2/2015 – present, Assoc. Prof. of Computer Science, Lawrence Tech. U., Southfield, MI.
• 8/2010 – 2/2015, Asst. Prof. of Computer Science, Lawrence Tech. U., Southfield, MI.
• 4/2007-8/2010, Research Fellow, NIA/NIH, Baltimore, MD.
• 8/2006-4/2007, Postdoctoral Fellow, NIA/NIH, Baltimore, MD.
• 2/2006-8/2006, Instructor, Michigan Technological U., Houghton, MI.

C. Products

(i) Related to the proposed project

Shamir, L., Wallin, J., Automatic detection and quantitative assessment of peculiar galaxy pairs in Sloan Digital Sky Survey, *Monthly Notices of the Royal Astronomical Society*, 443(4), 3528-3537, 2014.

Shamir, L., Yerby, C., Simpson, R., von Benda-Beckmann, A., Tyack, P., Samarra, F., Miller, P., Wallin , J., Classification of large acoustic datasets using machine learning and crowdsourcing - application to whale calls, *Journal of the Acoustical Society of America*, 135(2), 953-962, 2014.

Shamir, L., Computer analysis reveals similarities between the artistic styles of Van Gogh and Pollock, *Leonardo*, 45(2), 149-154. 2012.

Shamir, L., Ganalyzer: A tool for automatic galaxy image analysis, *Astrophysical Journal*, 736(2):141, 2011.

Shamir, L., Ling, S., Scott, W., Hochberg, M., Ferrucci, L., Goldberg, I.; Early detection of radiographic knee osteoarthritis using computer-aided analysis, *Osteoarthritis and Cartilage*, 17, 1307-1312, 2009.

(ii) Other significant products

Shamir, L., Handedness asymmetry of spiral galaxies with z<0.3 shows cosmic parity violation and a dipole axis, *Physics Letters B* (Nuclear Physics and Particle Physics), 715, 25-29, 2012.

Shamir, L., Delaney, J., Orlov, N., Eckley, D. M., Goldberg, I. G.; Pattern recognition software and techniques for biological image analysis, *PLoS Computational Biology*, 6, e1000974, 2010.

Shamir, L., Wallin, J.F., Allen, A., Berriman, B., Teuben, P., Nemiroff, R.J., Mink, J., Hanisch, R.J., DuPrie, K., Practices in source code sharing in astrophysics, *Astronomy & Computing*, 1, 54-58, 2013.

Shamir, L., Macura, T., Orlov, N., Eckley, D. M., Goldberg, I. G.; Impressionism, expressionism, surrealism: Automated recognition of painters and schools of art, *ACM Transactions on Applied Perception*, 7, 2:8. 2010.

Lixie, E., Edgeworth, J., Shamir, L., Comprehensive analysis of large sets of age-related physiological indicators reveals rapid aging around the age of 55, *Gerontology*, In Press.

D. Synergistic Activities

1. Scientific advisory board of the Astrophysics Source Code Library (since 2010).

2. Member of LSST Informatics and Statistics Science collaboration (since 2011).

3. Reviewer for the BMRD (biostatistics) study section at the NIH CSR (since 2010).

4. Member of the American Astronomical Society (Since 2010, student member since 2005).

E. Collaborators & Other Affiliations

(i) Collaborators and Co-Editors (16)
• Alsoffi, Ahmed, Advanced Bioimaging Systems, West Lafayette, IN
• Borne, Kirk, George Mason University, VA
• Brosch, Noah, Wise observatory
• Ch'ng, Queelig, King's College London, UK
• Delogu, Franco, Lawrence Technological University, MI
• Felson , David, Boston University Medical Center, Boston, MA.
• Ferrucci, Luigi, NIA/NIH, Baltimore, MD
• Hochberg, Marc, University of Maryland School of Medicine, Baltimore, MD
• Ling, Shari, Centers for Medicare & Medicaid Services, Baltimore, MD
• Nemiroff, Robert, Michigan Technological University, Houghton, MI
• Schurman, Shepherd, Laboratory of Molecular Gerontology, NIA/NIH, Baltimore, MD
• Simpson, Robert, Oxford University, UK.
• Scott, William, Johns Hopkins School of Medicine, Baltimore, MD
• von Benda-Beckmann, Alexander, TNO, Netherland
• Wallin, John, Middle Tennessee State University, TN
• Winner, Elin, Boston College, MA

(ii) Graduate Advisors and Postdoctoral Sponsors (3)
• Robert Nemiroff, Michigan Technological University, Houghton, MI.
• Postdoctoral Advisors: Ilya Goldberg, David Schlessinger, NIA/NIH, Baltimore, MD.

(iii) Thesis Advisor and Postgraduate-Scholar Sponsor (5)
• Joe George, Jane Tarakhovsky, Carol Yerby, Saundra Manning, Benjamin Bock.

Biographical Sketch for Shashi Shekhar

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Professional Preparation

Indian Institute of Technology, Kanpur (India)	Computer Science	B. Tech., 1985
University of California, Berkeley	Computer Science	M.S. 1987
University of California, Berkeley	Business Administration	M.S. 1987
University of California, Berkeley	Computer Science	Ph.D. 1989

Appointments

2005-present:	Distinguished University Professor, University of Minnesota, Minneapolis, MN	
2001-present:	Professor,	University of Minnesota, Minneapolis, MN
1995-2000:	Assoc. Professor,	University of Minnesota, Minneapolis, MN
1989-1995:	Asst. Professor,	University of Minnesota, Minneapolis, MN

Five Closely Related Products

1. Discovering Non-compliant Window Co-occurrence Patterns: A Summary of Results, accepted for the biennial Intl. Symp. on Spatial and Temporal Databases, 2015. (w/ R. Ali, W. Northrop et al.)
2. Significant Route Discovery: A Summary of Results, Proceedings of the International Conference on Geographic Information Science, 2014: 284-300, Springer LNCS 8728. (w/ D. Oliver et al.).
3. A K-Main Routes Approach to Spatial Network Activity Summarization, IEEE Transactions on Knowledge & Data Eng., 26(6), June 2014. (w/ D. Oliver, J. Kang, R. Laubscher, et al.)
4. Lagrangian Approaches to Storage of Spatio-Temporal Network Datasets, IEEE Trans. Knowledge and Data Eng. 26(9): 2222-2236, 2014. (w/ K. S. yang et al.).
5. Spatial big data for eco-routing services: computational challenges and accomplishments. ACM SIGSPATIAL Special 6(2): 19-25, 2014. (w/ R. Ali and V. Gunturi).

Five Other Significant Products

1. Spatial Computing: Accomplishments, Opportunities and Research Needs, accepted for the Communications of the ACM (w/ S. Feiner and W. Aref).
2. Spatiotemporal change footprint pattern discovery: an inter-disciplinary survey, Wiley Interdisciplinary Review: Data Mining and Know. Discovery 4(1): 1-23, 2014. (w/ X. Zhou et al.).
3. Identifying patterns in spatial information: a survey of methods, Wiley Interdisciplinary Review: Data Mining and Know. Discovery 1(3), 2011. (w/ M. Evans et al.).
4. Encyclopedia of GIS, Springer, 2008, isbn 978-0-387-30858-6. (Co-Ed. w/ H. Xiong).
5. A Tour of Spatial Databases, Prentice Hall, 2003, isbn 013-017480-7. (w/ S. Chawla).

Synergistic Activities

- Curriculum Development: Co-developed a Coursera MOOC titled "From GPS and Google Maps to Spatial Computing" (Fall 2014); Co-authored a popular textbook on Spatial Databases (Prentice Hall, 2003); co-edited an Encyclopedia of GIS (Springer, 2008), which was recommended highly by a review in ACM Computing Reviews (Nov. 2008); Presented tutorials on spatial data mining in conferences and other meetings; Led a NSF IGERT on interdisciplinary graduate education (2007-2012); Chaired curriculum committee of Computer Science & Eng. department at the University of Minnesota (1998-2000); Served as a Computer Science representative on UCGIS curriculum committee (1998-99); Served on IEEE-Computer Society Computer Sc. and Eng. Practices Publication Board (1995-97).

- Active participation in <u>broadening the participation of groups underrepresented</u> in science via supervising over two dozen undergraduate (UG) students from historically black colleges in Expedition and Army High Performance Computing Research Center annual summer workshops (1997-2006), NSF Research Experience for UGs, and UG Research Opportunity Program.

- <u>K-12 Outreach</u>: Served as a judge for Computer Science projects at 2012 national finals of the Siemens Competition in Math, Science & Technology for high school seniors.

- Serving as a member of the Computing Community Consortium Council (2012-2015) and as a co-Editor-in-Chief of Springer Geo-Informatica: An International Journal on Advances in Computer Sc. for GIS. Served as a member of National Academies committees (e.g., Geo-targeted Alerts & Warnings (2012), GEOINT Workforce (2011), Mapping Science Committee (2003-9), Priorities for GEOINT Research (2006), etc.) and the Board of Directors of University Consortium of Geographic Information Systems (UCGIS) for 2003-2004. Also served as a program co-chair for international conference on geographic information science (2012), and a general co-chair for the Symposium on Spatial and Temporal Databases (2011), etc.

- Received the UCGIS Education Award (2015), IEEE-CS Technical Achievement Award (2006) and was elected an IEEE fellow (2003) as well as an AAAS Fellow (2008) for contributions to spatial database storage methods, data mining, and geographic information systems (GIS). <u>Invited plenary speaker</u> on spatial big data, spatial computing and spatial data mining at many forums, e.g., GeoComputation (2015), NIST Data Science Conference (2014), ACM SIG-Spatial Big-Spatial Workshop (2012), SIGMOD MoBiDE Workshop (2012), ESRI Space-Time Modeling Workshop (2010), IBM T.J. Smarter Planet summit (2009), IEEE ICDM Workshop on Spatio-temporal Data Mining (2006), Intl. Symp. on Spatial & Temporal Databases (2005), ISPRS Intl. Symp. on Spatial Data Mining (2005), Intl. Conf. on Geo. Info. Sc. (2004), SAS data mining conf. (2003), etc.

Collaborators and Other Affiliations

- Collaborators in past 48 months (not counting those on BD-Hub proposal) include Prof. S. Gopal (Boston U), Prof. N. Samatova, & Prof. F. Semmazi (N. C. State U); Prof. A. Ganguli (Northeastern U); Prof. A. Choudhury & Prof. W. Liao (Northwestern U); Prof. A. Homafar (NCAT State U); Prof. A. Tripathi, Prof. M. Mokbel, Prof. W. Northrop, Prof. S. Ruggles, Prof. V. Interrante, Prof. S. Manson, Prof. J. Srivastava, Prof. V. Kumar, Prof. S. Banerjee, Prof. S. Chatterjee, Prof. J. Foley, Prof. J. Knight, & Prof. P. Snyder (U. of Minnesota);
  <u>Total number of collaborators</u>: 20

- Thesis advisors: Prof. C. V. Ramamoorthy & Prof. L. A. Zadeh (U. C. Berkeley). <u>Total number</u>: 2.

- Supervised Ph.D. thesis of Prof. T. A. Yang (U. of Houston), Prof. B. Hamidzadeh (Boeing), Prof. D. R. Liu (Taiwan), Dr. M. Coyle (Oracle), Dr. S. Ravada (Oracle Spatial), Dr. Ms. X. Liu (IBM TJ Watson), Prof. C. T. Lu (Virginia Tech), Prof. Ms. W. Wu (UT Dallas), Prof. Ms. H. Yan (U North Texas), Prof. H. Xiong (Rutgers U), Dr. B. Kazar (Oracle), Dr. P. Zhang (Microsoft), Dr. Q. Lu (Microsoft), Dr. R. Vatsavai (NCSU), Prof. Ms. J. Yoo (IUPU), Dr. S. Kim (ESRI), Prof. M. Celik (Erciyes U, Turkey), Dr. Ms. B. George (Oracle), Dr. J. Kang (USDOD-NGA), Dr. P. Mohan (SAS), Dr. M. Evans (Microsoft), Dr. D. Oliver (ESRI), Dr. X. Zhou (U of Iowa), Dr. K. S. Yang (FAU), Dr. V. Gunturi (IIIT Delhi, India).

- Supervised post-doctoral work of Dr. S. Chawla (University of Sydney). Following individuals visited my research laboratory for 3-weeks to a year: Daniel Cintra Cugler (Unicamp – Brazil), Rafal Angryk (Montana State University, USA), Ayman Taha (Cairo U, Egypt), Abdulvahit Torun (METU, Turkey), Prof. Zhanquan Wang (East China UST, Shanghai, China), Prof. P. Ranjan (DA-IICT, India), Prof. Sungwon Jung (Seoul National U), Prof. C. Eick (U Houston), Dr. Ms. Vania Bogorny (Brazil), Prof. B. Y. Hwang (Korea), Prof. Ms. H. Diwakar (Pune U., India), Dr. F. Polat (Bilkent U., Turkey), Prof. I. Singh (India).
  <u>Total number of graduate students advised and postdoctoral scholars sponsored</u>: 41

Kevin Smith
Director
Department of Computational Medicine & Bioinformatics
University of Michigan
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A. PROFESSIONAL PREPARATION:

Berea College	Berea, KY	Industrial Arts	BS	1979
Eastern Michigan University	Ypsilanti, MI	Information Systems	MSIS	1992

B. APPOINTMENTS:

2013 – Present	Secretary, Chief Operating Officer and Community Manager, tranSMART Foundation
2010 – Present	Director, University of Michigan Medical School
2012 – 2013	Executive Director, tranSMART Foundation
2007 – 2010	Senior Manager, University of Michigan Medical School
2006 – 2007	Clinical Research Informatics Manager, University of Michigan Medical School
2003 – 2006	Business Systems Team Leader, University of Michigan Health System
1999 – 2003	Systems Project Coordinator, University of Michigan Medical School
1990 – 1999	Systems Analyst / Applications Programmer, University of Michigan Health System
1989 – 1990	Consultant, AGS Information Services, Inc., Farmington Hills, Ml
1988 – 1989	General Manager, Packard Business Systems, Inc, Ann Arbor, MI
1987 – 1988	Marketing Consultant, Avis Farms Research & Business Park, Ann Arbor, MI

C. PRODUCTS:

(i) Products Most Closely Related to the Proposed Project.

1. Tenenbaum JD, Whetzel PL, Anderson K, Borromeo CD, Dinov ID, Gabriel D, Kirschner B, Mirel B, Morris T, Noy N, Nyulas C, Rubenson D, Saxman PR, Singh H, Whelan N, Wright Z, Athey BD, Becich MJ, Ginsburg GS, Musen MA, **Smith KA**, Tarantal AF, Rubin DL, Lyster P. The Biomedical Resource Ontology (BRO) to enable resource discovery in clinical and translational research. J Biomed Inform 2011; 44(1): 137-45. PMID: 20955817.

2. Boyd AD, Saxman PR, Hunscher DA, **Smith KA**, Morris TD, Kaston M, Bayoff F, Rogers B, Hayes P, Rajeev N, Kline-Rogers E, Eagle K, Clauw D, Greden JF, Green LA, Athey BD. The University of Michigan Honest Broker: a Web-based service for clinical and translational research and practice. J Am Med Inform Assoc. 2009 Nov-Dec;16(6):784-91. Epub 2009 Aug 28. PMID: 19717803

D. SYNERGISTIC ACTIVITIES:

1. tranSMART Foundation (www.transmartfoundation.org): manages Foundation's corporate records (Bylaws, meeting minutes and legal filings), responsible for managing day to day operations of tranSMART Foundation, managing the community manager(s) and delivering information to and collecting feedback from the community

2. Michigan Institute for Data Science (midas.umich.edu): active in planning and launching (July 2015) a five-year Data Science Initiative at the University of Michigan that includes MIDAS as well as investments in data science services and infrastructure.

E.   COLLABORATORS & OTHER AFFILIATIONS:

(i) Collaborators and Co-Editors During the Past Four Years - TOTAL = 15

- **tranSMART Foundation**: Jay Bergeron, Michael Braxenthaler, Sherry Cao, Keith Elliston, Ashley George, Yike Guo, Steve Johnson, Rudy Potenzone
- **University of Michigan**: Brian Athey, Alex Ade, Matthias Kretzler, Vasu Mahavisho, Gilbert Omenn, Terry Weymouth, Zach Wright

(ii) Investigator's Graduate and Postdoctoral Advisors - TOTAL = 0

(iii) Thesis Advisor and Postgraduate-Scholar Sponsor- TOTAL = 0

Biosketch - Olaf Sporns, PhD

(a) Professional Preparation

Undergraduate: BS Biochemistry, University of Tubingen (Germany), 1986

Graduate: PhD Neuroscience, Rockefeller University, 1990

Postgraduate: Theoretical Neuroscience, Neurosciences Institute, 1990-1994

(b) Appointments

2014: Co-Director, Indiana University Network Science Institute

2014: Robert H. Shaffer Endowed Chair, Distinguished Professor, Indiana University

2013: Fellow of the American Association for the Advancement of Science (AAAS)

2011: Provost Professor, Department of Psychological and Brain Sciences, Indiana University.

2007: Professor, Department of Psychological and Brain Sciences, Indiana University.

2004: Associate Professor, Department of Psychology, Indiana University.

2000: Assistant Professor, Department of Psychology, Indiana University.

1994: Senior Fellow in Theoretical and Experimental Neurobiology, The Neurosciences Institute, La Jolla, CA.

(c) Products

i) Products most closely related:

- Goñi J, van den Heuvel MP, Avena-Koenigsberger A, Velez de Mendizabal N, Betzel RF, Griffa A, Hagmann P, Corominas-Murtra B, Thiran JP, Sporns O (2014) Resting-brain functional connectivity predicted by analytic measures of network communication. Proc. Natl. Acad. Sci. USA 111, 833-838.
- Van den Heuvel MP, Kahn R, Goni J, Sporns O (2012) A high-cost, high-efficiency backbone for global brain communication. Proc Natl Acad Sci USA 109, 11372-11377.
- Van den Heuvel MP, Sporns O (2011) Rich-club organization of the human connectome. J Neurosci 31, 15775-15786.
- Rubinov M, Sporns O (2010) Complex network measures of brain connectivity: Uses and interpretations. *Neuroimage* 52, 1059-1069.
- Honey CJ, Sporns O, Cammoun L, Gigandet X, Thiran JP, Meuli R, Hagmann P (2009) Predicting human resting-state functional connectivity from structural connectivity. Proc. Natl. Acad. Sci. USA 106, 2035-2040.

ii) Other significant products

- Sporns O (2013) Network attributes for segregation and integration in the human brain. Curr Opin Neurobiol 23, 162-171.
- Bullmore ET, Sporns O (2012) The economy of brain network organization. Nature Rev Neurosci 13, 336-349.
- Sporns O (2011) Networks of the Brain. MIT Press, Cambridge.

- Hagmann, P., Cammoun, L., Gigandet, X., Meuli, R., Honey, C.J., Wedeen, V.J., Sporns, O. (2008) Mapping the structural core of human cerebral cortex. PLoS Biology 6, e159.
- Sporns, O., Tononi, G., and Kötter, R. (2005) The human connectome: A structural description of the human brain. PLoS Computational Biology 1, 245-251.

(d) Synergistic Activities

- Co-PI, IGERT Training Grant on "The Dynamics of Brain-Body-Environment Systems in Behavior and Cognition", Chair of Education and Training Committee
- Course Development: "Networks of the Brain" (Graduate Course), "The Connected Brain" (Undergraduate Course)
- Development and maintenance of the "Brain Connectivity Toolbox", an open-source Matlab utility for analysis of brain connectivity data sets (since 2002)
- Deputy Editor-in-Chief: *PLOS Computational Biology*
- Associate Editor or Board Member: *Cerebral Cortex*, *Neuroimage*, *Neuroinformatics*, *Brain Connectivity*, *Adaptive Behavior*

(e) Collaborators & Other Affiliations

(i) Collaborators and Co-Editors

Collaborators (past 48 months; 38 total): Yong-Yeol Ahn (IU), John Beggs (IU), Mihai Bota (USC), Michael Breakspear (QIMR, Brisbane), Ed Bullmore (University of Cambridge), Andreas Burkhalter (Washington University), Catie Chang (NIH), Huafu Chen (Chengdu), Ann-Shyn Chiang (Tsing Hua University, Taiwan), Gustavo Deco (UPF Barcelona), Alessandro Flammini (IU), Ellen Grant (MGH), Ralph Greenspan (UCSD), Patric Hagmann (EPFL Lausanne), Ahmad Hariri (Duke), Bill Hetrick (IU), Matt Hutchison (Harvard), Viktor Jirsa (Marseille), Rene Kahn (Utrecht), Dmitri Krioukov (UCSD), Randy McIntosh (Rotman Research Institute), Mike Milham (NYU), Claudio Mirasso (Las Palmas), Yasui Miyashita (U. Tokyo), Brian O'Donnell (IU), Maria Pastor (University of Navarra), Bernice Pescosolido (IU), Steve Petersen (Washington University), Petra Ritter (Charite Berlin), Luis Rocha (IU), Mika Rubinov (Cambridge), Andy Saykin (IUPUI), Linda Smith (IU), Ricard Solé (UPF Barcelona), Larry Swanson (USC), Daniel Tranel (Iowa), Martijn van den Heuvel (Utrecht Medical Center), Xi-Nian Zuo (CAS, Beijing).

Co-Editors (most closely associated; 3 total): Konrad Koerding (Northwestern U), Lyle Borg-Graham (Universite de Paris), Tim Behrens (Oxford)

(ii) Graduate Advisors and Postdoctoral Sponsors

Gerald Edelman (Scripps Research Institute, Neurosciences Institute; deceased)

(iii) Thesis Advisor and Postgraduate Scholar Sponsor

PhD Mentor (5 total) - William Alexander (Ghent University), George Chadderdon (SUNY Stony Brook), Chris Honey (U. Toronto), Andrea Avena-Koenigsberger (IU), Richard F. Betzel (IU)

Postgraduate Mentor (4 total, 3 last five years) – Jean-Phillipe Thivierge (Ottawa), Joaquin Goni (IUPUI), Bratislav Misic (IU)

John Towns
Executive Director, Science & Technology
National Center for Supercomputing Applications
1205 W Clark
Urbana, IL 61801

Professional Preparation:
> B.S. Degree in Physics, University of Missouri - Rolla, Dec 1987.
> M.S. in Physics, University of Illinois - Urbana-Champaign, May 1990.
> M.S. in Astronomy, University of Illinois - Urbana-Champaign, Dec 1991.

Major Appointments

1992-Present at the National Center for Supercomputing Applications (NCSA), University of Illinois.

2014-present: *Executive Director, Science & Technology*
This position is responsible for oversight of several units at NCSA including Research & Education, the @scale Program Office (including Blue Waters), the Collaborative eScience Program Office (including XSEDE), and the Cybersecurity Directorate. This position entails overseeing and strategically positioning NCSA to develop and support the integrated, technical cyberinfrastructure resources and services that national and local communities need to foster their research.

2011-present: *Director, Collaborative eScience Program Office*
This position is responsible for enabling innovation and knowledge discovery through leadership in the creation of an advanced digital services ecosystem to support open research. The Collaborative eScience Program Office (CeSP) develops programs and executes projects to realize this mission and to support the evolution of the advanced digital research services ecosystem, facilitate advanced digital research services innovation, and sustain that ecosystem. This position focuses on strategic planning for NCSA and the CeSP; promotes services, activities, and partnerships on a national and international scale; develops funding resources for the advancement of NCSA and CeSP goals; creates new and extends existing partnerships that advance NCSA's mission of designing, building, and deploying national-scale cyberinfrastructure to advance science and engineering in the United States.

2011-present: *PI and Project Director of XSEDE:* This position is responsible for providing leadership, strategic planning, and coordination for the XSEDE project (www.XSEDE.org, $121M / 5 years). This involves providing leadership for the project and acting as an ambassador to other projects and activities. In addition, the role involves leading the annual processes to determine strategic objectives, development projects and operational activities. The role also represents the project to NSF and acts as the primary communication contact.

2007-2008: *Interim co-Chair of the TeraGrid Forum*
2008-2011: *Chair of the TeraGrid Forum:* This elected position is responsible for providing leadership, strategic planning, and coordination for the TeraGrid Forum, the leadership and management body for the TeraGrid Project (~$65M/year).

1998-1999: *Senior Associate Director, Scientific Computing and Visualization*.
1999-2004: *Division Director, Scientific Computing*
2004--present: *Director, Persistent Infrastructure*: Responsible for strategic planning, architecture, scientific application support, visualization and virtual environments, hardware acquisition planning, networking, security, resource allocation, distributed applications support and services, and management of a national supercomputing facility and high performance computing environment.

2007-present: *Principal Investigator, NCSA TeraGrid Resource Provider, HPCOPS and Co-PI, CORE Services.* Responsible for executing on the NCSA TeraGrid Resource provider award ($14.9M, 5 year award), the HPCOPS supplement to that award ($17.8M, 2 year award) and the NCSA portion of the CORE Services award ($2.4M, 2 year award) supporting NCSA's production cyberinfrastructure resources as part of the TeraGrid.

1993-Present. *Chair - NCSA Computer Policy Committee,* Responsible for forming a group to set policy on the use and allocation of a national supercomputing facility. This group consists of representatives of all NCSA groups and users.

2004-2007: *Principal Investigator, Computational Chemistry Grid: Production Cyberinfrastructure for Computational Chemistry.* Responsible for executing on the NCSA portion of a three year, $2.7M grant to

deploying and supporting production cyberinfrastructure to support computational chemistry research.

1997-2006: *Principal Investigator, National Laboratory for Applied Network Research (NLANR) – Distributed Applications Support Team.* Responsible for executing on an initial $2.6M, three year grant followed by a $3.7M, three year grant, both funded by the National Science foundation involving all aspects of development, planning, budgeting, staffing and reporting. The Distributed Applications Support Team offers support for researchers working with high-performance network applications and assists in the development of distributed applications and tools.

1997-1998. *Associate Director, Scientific Computing.* Responsible for strategic planning, scientific application support, visualization production, resource allocation and management of a national supercomputing facility and local high performance computing environment. In 1997 directing the integration of all high-end user support, visualization production, applications performance and algorithmic application, resource management, and many scientific disciplinary specific support groups to form the 50-FTE Scientific Computing division. Led efforts in integrating all these efforts to span the 100+ institution collaboration of the National Computational Science Alliance.

1995-1997, *Coordinator, NCSA Alliance Programs,* Coordinate the formation of two international coalitions of corporate, government and academic sites which have scalable, superscalar microprocessor based systems similar to those at the NCSA.

1995-97, *Manager, SDG Software Technical Support Team,* Responsible for bringing together technical support personnel in order to provide technical assistance to users of NCSA Mosaic, NCSA HTTPd and Habanero world-wide.

1993-97, *Team Leader, NCSA High-Performance Computing Consulting Services,* Responsible for the management of user support functions of a national supercomputing facility and local high performance computing environment.

May-July1992. *Summer Internship, Thinking Machines Corporation,* Development of the CMStab package, iterative linear system solvers for the Connection Machine 5. Development was performed on latest hardware and software systems and involved bug reporting and development suggestions.

1992-93. *Research Programmer, Numerical Relativity Group,* Numerical modeling of the Einstein equations for the case of black hole space-times (General Relativity). Emphasis on porting codes across architectures (Cray, Connection Machine and Convex), and development of efficient linear system solvers for elliptic partial differential equations

Recent Products

John Towns, Timothy Cockerill, Maytal Dahan, Ian Foster, Kelly Gaither, Andrew Grimshaw, Victor Hazlewood, Scott Lathrop, Dave Lifka, Gregory D. Peterson, Ralph Roskies, J. Ray Scott, Nancy Wilkins-Diehr, "XSEDE: Accelerating Scientific Discovery", *Computing in Science & Engineering*, vol.16, no. 5, pp. 62-74, Sept.-Oct. 2014, doi:10.1109/MCSE.2014.80

Furlani, Thomas R, et al. "Using XDMoD to facilitate XSEDE operations, planning and analysis." *Proceedings of the Conference on Extreme Science and Engineering Discovery Environment: Gateway to Discovery.* San Diego, California: ACM, 2013. 46.

D. Katz, D. Hart, C. Jordan, A. Majumdar, J.P. Navarro, W. Smith, J. Towns, V. Welch, N. Wilkins-Diehr, "Cyberinfrastructure Usage Modalities on the TeraGrid." *2011 IEEE International Symposium on Parallel and Distributed Processing Workshops and Phd Forum (IPDPSW).* Shanghai: IEEE, 2011. 932-939.

Synergistic Activities

PI and Project Director of XSEDE: John Towns provides overall coordination a leadership for the XSEDE program and relationships with other infrastructure providers such as OSG, PRACE, EGI, EUdat, Compute Canada, RIKEN which in turn provides leadership for the XSEDE Project as a whole.

Collaborators and Other Affiliations (9 total)
(i) Collaborators. Ian Foster, UChicago, Kelly Gaither, UT-Austin/TACC, Charlie Catlett, ANL/UIC, Randy Butler, UIUC/NCSA, Dr. John Connolly, Univ of Ky, Ralph Roskies, PSC/CMU, Michael Levine, PSC/Pitt, Robert Harisson, UT-Knoxville, Nancy Wilkins-Diehr, UCSD/SDSC
(ii) Graduate and Post Doctoral Advisors.   Dr. Larry Smarr, UCSD
                                                                              Dr. Edward Seidel, NCSA/Univ of Illinois
(iii) Thesis Advisor and Postgraduate-Scholar Sponsor.   [none]

MATTHEW J. TURK

Professional preparation

Physics & Math, B.A., 2003, Northwestern University

Department of Astronomy and Astrophysics, Penn State. (graduate education; 2003-2004)

Physics, PhD, June 2009, Department of Physics, Stanford University. Member, Kavli Institute for Particle Astrophysics and Cosmology. (advisor: Tom Abel)

University of California, San Diego, Astronomy. (postdoc; 2009-2010)

Columbia University, NSF Postdoctoral Fellow in Cyber Infrastructure for Transformative Computational Science (CI TraCS) (2011-2013)

Appointments

07/2014– Research Assistant Professor, Department of Astronomy, UIUC

06/2014– Research Scientist, National Center for Supercomputing Applications, UIUC

01/2014-06/2014 Associate Research Scientist, Columbia University

2011-2013 NSF Postdoctoral Fellow, Columbia University

2009-2010 Postdoctoral Fellow, Astrophysics, University of California, San Diego

2004-2009 Graduate Research Assistant, KIPAC, Stanford University

Relevant Products

- The yt Analysis Toolkit: `http://yt-project.org/`
- Turk, M., "How to Scale a Code in the Human Dimension," Proceedings of the Conference on Extreme Science and Engineering Discovery Environment: Gateway to Discovery (XSEDE13). (arXiv: `http://arxiv.org/abs/1301.7064`)
- Turk, M., Oishi, J.S., Abel, T., Bryan, G., "Magnetic Fields in Population III Star Formation," *Astrophysical Journal*, Volume 745, Issue 2 (2012). (arXiv: `http://arxiv.org/abs/1112.4479`)
- Turk, M., Smith, B.D., Oishi, J.S., Skory, S., Abel, T., Norman, M.L., "yt: A Multi-Platform Analysis Toolkit for Astrophysical Simulation Data," *Astrophysical Journal Supplements*, Volume 192, Issue 9.
- Turk, M.J., & Abel, T., & O'Shea, B., "The Formation of Population III Binaries from Cosmological Initial Conditions," *Science*, Volume 325, Issue 5940, pp. 601- (2009).

Additional Products

- Katz, D. S., Choi, S.-C. T., Lapp, H., Maheshwari, K., Löffler, F., **Turk, M.**, Hanwell, M. D., Wilkins-Diehr, N., Hetherington, J., Howison, J., Swenson, S., Allen, G. D., Elster, A. C., Berriman, B., Venters, C., "Summary of the First Workshop on Sustainable Software for Science: Practice, Experiences (WSSSPE1)," *Journal of Open Research Software* (submitted), 2014. (arXiv: `http://arxiv.org/abs/1404.7414`)
- Wise, J. H., & Abel, T., **Turk, M.**, Norman, M. L., Smith, B., "The Birth of a Galaxy. II. The Role of Radiation Pressure," Monthly Notices of the Royal Astronomical Society, Volume 427, Issue 1 (2012). (arXiv: `http://arxiv.org/abs/1206.1043`)

- "The Birth of a Galaxy: Primordial Metal Enrichment and Stellar Populations," *Astrophysical Journal*, Volume 745, Issue 1 (2012). (arXiv: `http://arxiv.org/abs/1011.2632`)
- Turk, M., Norman, M.L., Abel, T., "High-Entropy Polar Regions Around the First ProtoStars," *Astrophysical Journal Letters*, Volume 725, Issue 2, pp. L140-L144 (2010).
- Turk, M.J., Clark, P., Glover, S.C.O., Greif, T., Abel, T., Klessen, R., Bromm, V., "Effects of Varying 3-Body Molecular Hydrogen Formation Rate in Primordial Star Formation," *Astrophysical Journal*, Volume 726, Issue 1, Article 55 (2011).

Synergistic activities

- Lead developer and project lead for the analysis tookit `yt` (`yt-project.org`). Organized workshops in January 2012, March 2013, and March 2014. This code is an NSF SI2 project, and has been used in over 110 papers in the last three years, with an active community of several hundred users and contributions from over 50 individual developers, and has produced visualizations for planetariums and short-form outreach.
- Journal of Open Research Software (JORS), Section Editor: Issues in Research Software. Computing in Science and Engineering: Editorial Board Member, Co-Editor of Scientific Programming. Computing Now: CiSE Magazine liason.
- Core developer of the Enzo adaptive mesh refinement cosmology code organizer of user and developer meetings in June 2010, April 2011, October 2011, and May 2014. This code has been used in several hundred scientific papers.
- Member of Program Committee, Workshop on Sustainable Scientific Software, Practices and Experiences (WSSSPE), SC13. Member of Organizing Committee for WSSSPE@SciPy 2014 and for WSSSPE2 at SC14.
- Member of program committee for SciPy 2012, Member of organizing committee for SciPy 2013 conference, and Communications Co-Chair for SciPy 2014. The SciPy Conference is an annual, cross-domain scientific computing conference with several hundred attendees from both academia and industry.

Collaborators and other affiliations

Collaborators: Tom Abel (KIPAC/Stanford), Gabrielle Allen (NCSA/UIUC), Marcelo Alvarez (CITA), James Bordner (UC San Diego), Volker Bromm (UT Austin), Greg Bryan (Columbia University), David Collins (Florida State University), Eric Hallman (Tech-X), Ben Holtzman (Columbia), Cameron Hummels (Columbia University), Daniel Katz (University of Chicago), Kristina Keating (Rutgers), Ji-hoon Kim (KIPAC/Stanford), Michael Norman (UC San Diego), Brian O'Shea (Michigan State) Jeffrey Oishi (AMNH), Ed Seidel (NCSA/UIUC), Devin Silvia (Michigan State), Sam Skillman (KIPAC/Stanford), Stephen Skory (Colorado Boulder), Geoffrey So (UC San Diego), Dan Reynolds (Southern Methodist University), Britton Smith (University of Edinburgh), Peng Wang (NVIDIA), John Wise (Princeton), Fen Zhao (NSF)

Thesis advisor: Tom Abel (KIPAC/Stanford)

Postgraduate sponsors: Michael L. Norman (UC San Diego), Greg Bryan (Columbia University)

Total number of postdoctoral scientists and graduate students advised: 1.
Total number of scientific code contributors reviewed: 60. Total number of collaborators: 25.

Shaowen Wang

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Department of Computer Science
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http://cigi.illinois.edu; http://cybergis.illinois.edu/

Professional Preparation

The University of Iowa, Iowa City, IA, USA	Geography	PhD, 2004
The University of Iowa, Iowa City, IA, USA	Computer Science	MCS, 2002
Peking University, Beijing, P. R. China	Geography	MS, 1998
Tianjin University, Tianjin, P. R. China	Computer Engineering	BS, 1995

Appointments

2013 – present	Founding Director, CyberGIS Center, UIUC
2013 – present	Centennial Scholar, College of Liberal Arts and Sciences, UIUC
2013 – present	Full Professor (with tenure), Department of Geography and Geographic Information Science, UIUC
2010 – present	Associate Director for CyberGIS, NCSA
2007 – present	Senior Research Scientist, NCSA
2010 – 2013	Associate Professor (with tenure), Department of Geography and Geographic Information Science, UIUC
2007 – 2010	Assistant Professor (tenure-track), Department of Geography, UIUC
2005 – 2007	Research Scientist, Academic Technologies, the University of Iowa
2004 – 2007	Adjunct Assistant Professor, Department of Geography, the University of Iowa
2002 – 2005	Assistant Research Scientist, Academic Technologies, the University of Iowa

Closely Related Products

[1] Liu, Y.Y., Padmanabhan, A., and **Wang, S.** 2015. "CyberGIS Gateway for Enabling Data-Rich Geospatial Research and Education". *Concurrency and Computation: Practice and Experience*, 27(2): 395-407

[2] **Wang, S.**, Anselin, L., Bhaduri, B., Crosby, C., Goodchild, M. F., Liu, Y., and Nyerges, T. L. 2013. "CyberGIS Software: A Synthetic Review and Integration Roadmap". *International Journal of Geographical Information Science*, 27(11): 2122-2145

[3] Wright, D. J. and **Wang, S.** 2011. "The Emergence of Spatial Cyberinfrastructure". *Proceedings of the National Academy of Sciences*, 108 (14): 5488–5491

[4] **Wang, S.** 2010. "A CyberGIS Framework for the Synthesis of Cyberinfrastructure, GIS, and Spatial Analysis". *Annals of the Association of American Geographers*, 100 (3): 535-557

[5] **Wang, S.** and Armstrong, M. P. 2009. "A Theoretical Approach to the Use of Cyberinfrastructure in Geographical Analysis". *International Journal of Geographical Information Science*, 23 (2): 169-193

Other Significant Products

[1] **Wang, S.** 2013. "CyberGIS: Blueprint for Integrated and Scalable Geospatial Software Ecosystems". *International Journal of Geographical Information Science*, 27(11): 2119-2121

[2] Zhao, Y., Padmanabhan, A., and **Wang, S.** 2013. "A Parallel Computing Approach to Viewshed Analysis of Large Terrain Data Using Graphics Processing Units". *International Journal of Geographical Information Science*, 27 (2): 363-384.

[3] **Wang, S.**, Wilkins-Diehr, N. R., and Nyerges, T. L. 2012. "CyberGIS – Toward Synergistic Advancement of Cyberinfrastructure and GIScience: A Workshop Summary". *Journal of Spatial Information Science*, 4: 125-148

[4] **Wang, S.**, Liu, Y., Wilkins-Diehr, N., and Martin, S. 2009. "SimpleGrid Toolkit: Enabling Geosciences Gateways to Cyberinfrastructure". *Computers and Geosciences*, 35: 2283-2294

[5] **Wang, S.** and Zhu, X-G. 2008. "Coupling Cyberinfrastructure and Geographic Information Systems to Empower Ecological and Environmental Research". *BioScience*, 58 (2): 94-95

Synergistic Activities

- Award/Honor: National Science Foundation (NSF) CAREER Award, 2009
- Leadership: Invited talk for Federal Agency and Department Briefing on GIScience and Cyberinfrastructure: Making Connections, February 7, 2008
- Pedagogical: Teaching a number of courses and tutorials in the areas of geographic information science and systems, distributed systems, high performance parallel and distributed computing, and geospatial problem solving
- Software: Author of several software tools and systems in the areas of geographic information systems (GIS), middleware, and data-intensive applications, including for example, the GISolve Middleware and CyberGIS Software Environment (http://cybergis.org) with thousands of users
- Service: Action Editor of *GeoInformatica* (Springer), Member of the National Research Council's Board on Earth Sciences and Resources of the U.S. National Academies

Collaborators and Co-Editors (Total: 16)

Luc Anselin (Arizona State University), Budhendra Bhaduri (Oak Ridge National Laboratory), Michael Goodchild (University of California, Santa Barbara), Kate Keahey (Argonne National Laboratory and University of Chicago), Praveen Kumar (UIUC), Timothy Nyerges (University of Washington), Carole Palmer (University of Washington), Robert Pennington (UIUC), Luis Rodriguez (UIUC), Eric Shook (Kent State University), Murugesu Sivapalan (UIUC), Marc Snir (Argonne National Laboratory and UIUC), Wenwu Tang (University of North Carolina), E. Lynn Usery (US Geological Survey), Nancy Wilkins-Diehr (San Diego Supercomputer Center), Dawn Wright (Esri)

Graduate Advisors (Total: 2)

Drs. Marc P. Armstrong and Joseph K. Kearney (the University of Iowa)

Thesis Advisor and Postgraduate-Scholar Sponsor (Total: 19)

Graduate: PhD in Computer Science: Anand Padmanabhan (2006, thesis co-advisor with Dr. Sukumar Ghosh, the University of Iowa); PhD in Geography: Eric Shook (2013, UIUC); MS in Computer Science: Babak Behzad (2013, thesis co-advisor with Dr. Marc Snir, UIUC); MS in Geography: Dan Dong (2013, UIUC), Su Y. Han (2012, UIUC), Heejun Kim (2013, UIUC), Chris Korose (2010, UIUC), and Yanli Zhao (2013, UIUC)

Postdoc: Guofeng Cao, Kai Cao, Jing Gao, Myunghwa Hwang, Myeonghun Jeong, Tao Lin (co-advisor with Dr. Luis Rodriguez), Junjun Yin (UIUC); Anand Padmanabhan (the University of Iowa); Liujun Li, Aiman Soliman, Wenwu Tang, Liang Yu (co-advisor with Dr. Yong Liu) (NCSA/UIUC)

Scott Wilkin
cswilkin@illinois.edu
Associate Director
University of Illinois Urbana-Champaign, NCSA

Professional Preparation

Institution	*Major/Area of Study*	*Degree*	*Year*
Southern Illinois University, Carbondale, Illinois	Physics	B.S.	1989
University of Oklahoma, Norman, Oklahoma	Engineering Physics	M.S.	1995

Appointments

2014-Present	Associate Director – Economic Development, University of Illinois Urbana-Champaign NCSA
2006-2014	Vice-President – Business Development, Alcatel-Lucent
2000-2006	Director – Product Line Management, Alcatel-Lucent
1999-2000	Software Development Manager, Alcatel-Lucent
1997-1999	Test Engineering/Operations Manager, National Semiconductor
1994-1997	Senior Product Line Manager, National Semiconductor
1992-1994	Intermediate Product Line Engineer, Texas Instrument

Products - None

Synergistic Activities - None

Collaborators and Other Affiliations - None

Biographical Sketch

Alex Yahja, Ph.D.

Research Associate
National Center for Supercomputing Applications

3016 NCSA Building
1205 West Clark St.
Urbana, IL 61801
alexy@uiuc.edu

PROFESSIONAL PREPARATION
Carnegie Mellon University, Computation, Organizations and Society, *Ph.D.*, 2006
Carnegie Mellon University, Engineering and Public Policy, *M.Sc.*, 2004
Carnegie Mellon University, Robotics, *M.Sc.*, 2000

APPOINTMENTS
National Center for Supercomputing Applications, Research Associate, 2006-Present

PRODUCTS
Products Most Closely Related
Pilny, A., Yahja, A., Poole, M.S., Dobosh, M., A Dynamic Social Network Experiment with Multi-Team Systems, 7th IEEE International Conference on Social Computing and Networking *SocialCom 2014*, Sydney, Australia, December 3-5, 2014.
http://www.computer.org/csdl/proceedings/bdcloud/2014/6719/00/6719a587-abs.html

Carley, K., Fridsma, D., Casman, E., Altman, N., Kamisky, B., Yahja, A., and Nave, D., BioWar: Scalable Agent-based Model of Bioattacks, *IEEE Trans. on Systems, Man, and Cybernetics, Part A: Systems and Humans*, Vol. 36, No. 2, March 2006, pp. 252-265.
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SYNERGETIC ACTIVITIES
XSEDE Startup Allocation on Stampede Supercomputer for Network Analytics

COLLABORATORS (TOTAL: 22)
Alan Craig, NCSA; Marshall Scott Poole, UIUC; Alice Leung, Raytheon BBN; Dmitri Williams, USC; Melissa Dobosh, University of Northern Iowa; Kevin Franklin, NCSA; Eric Jakobsson, NCSA; Gene Robinson, University of Illinois at Urbana-Champaign (UIUC); Noshir Contractor, Northwestern University; Virginia Bedford, CMU; Klara Nahrstedt, UIUC; Christopher Larrison, UIUC; Ruby Mendenhall, UIUC; Peter Bajcsy, National Institute of Standards and Technology; Ian Brooks, NCSA; Vernon Burton, Clemson University; Boris Kaminsky, Pittsburgh Supercomputing Center (PSC); Demian Nave, PSC; Neal Altman, Carnegie Mellon University (CMU); Li-Chiou Chen, Pace University

GRADUATE AND POSTDOCTORAL ADVISORS (TOTAL: 7)
Douglas Fridsma, Arizona State University; Elizabeth Casman, Carnegie Mellon University; Norman Sadeh, Carnegie Mellon University; Noshir Contractor, Northwestern University; Sanjiv Singh, Carnegie Mellon University; Anthony Stentz, Carnegie Mellon University

THESIS ADVISOR (TOTAL: ONE)
Kathleen Carley, Carnegie Mellon University

SUMMARY
PROPOSAL BUDGET
YEAR 1

FOR NSF USE ONLY			
PROPOSAL NO.	DURATION (months)		
	Proposed	Granted	
AWARD NO.			

ORGANIZATION
University of Illinois at Urbana-Champaign

PRINCIPAL INVESTIGATOR / PROJECT DIRECTOR
Edward Seidel

A. SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title, A.7. show number in brackets)	NSF Funded Person-months			Funds Requested By proposer	Funds granted by NSF (if different)
	CAL	ACAD	SUMR		
1.	0.00	0.00	0.00		
2.					
3.					
4.					
5.					
6. (**0**) OTHERS (LIST INDIVIDUALLY ON BUDGET JUSTIFICATION PAGE)	0.00	0.00	0.00	**0**	
7. (**1**) TOTAL SENIOR PERSONNEL (1 - 6)	0.00	0.00	0.00	**0**	
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)					
1. (**0**) POST DOCTORAL SCHOLARS	0.00	0.00	0.00	**0**	
2. (**3**) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.)	11.00	0.00	0.00	**93,868**	
3. (**0**) GRADUATE STUDENTS				**0**	
4. (**0**) UNDERGRADUATE STUDENTS				**0**	
5. (**0**) SECRETARIAL - CLERICAL (IF CHARGED DIRECTLY)				**0**	
6. (**0**) OTHER				**0**	
TOTAL SALARIES AND WAGES (A + B)				**93,868**	
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)				**36,740**	
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A + B + C)				**130,608**	
D. EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING $5,000.)					
TOTAL EQUIPMENT				**0**	
E. TRAVEL 1. DOMESTIC (INCL. U.S. POSSESSIONS)				**15,000**	
2. FOREIGN				**0**	
F. PARTICIPANT SUPPORT COSTS					
1. STIPENDS $ **0**					
2. TRAVEL **34,000**					
3. SUBSISTENCE **0**					
4. OTHER **6,000**					
TOTAL NUMBER OF PARTICIPANTS (**240**) TOTAL PARTICIPANT COSTS				**40,000**	
G. OTHER DIRECT COSTS					
1. MATERIALS AND SUPPLIES				**0**	
2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION				**0**	
3. CONSULTANT SERVICES				**0**	
4. COMPUTER SERVICES				**2,475**	
5. SUBAWARDS				**150,000**	
6. OTHER				**0**	
TOTAL OTHER DIRECT COSTS				**152,475**	
H. TOTAL DIRECT COSTS (A THROUGH G)				**338,083**	
I. INDIRECT COSTS (F&A)(SPECIFY RATE AND BASE)					
MTDC F&A (Rate: 58.6000, Base: 248083)					
TOTAL INDIRECT COSTS (F&A)				**145,377**	
J. TOTAL DIRECT AND INDIRECT COSTS (H + I)				**483,460**	
K. SMALL BUSINESS FEE				**0**	
L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K)				**483,460**	
M. COST SHARING PROPOSED LEVEL $ **0** AGREED LEVEL IF DIFFERENT $					

PI/PD NAME	**FOR NSF USE ONLY**
Edward Seidel	INDIRECT COST RATE VERIFICATION
ORG. REP. NAME*	Date Checked / Date Of Rate Sheet / Initials - ORG
Stephanie Fellmann	

1 *ELECTRONIC SIGNATURES REQUIRED FOR REVISED BUDGET

SUMMARY
PROPOSAL BUDGET

YEAR   2

					FOR NSF USE ONLY	
ORGANIZATION **University of Illinois at Urbana-Champaign**					PROPOSAL NO.	DURATION (months)
						Proposed | Granted
PRINCIPAL INVESTIGATOR / PROJECT DIRECTOR **Edward Seidel**					AWARD NO.	

A. SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title, A.7. show number in brackets)	NSF Funded Person-months			Funds Requested By proposer	Funds granted by NSF (if different)
	CAL	ACAD	SUMR		
1.	0.00	0.00	0.00		
2.					
3.					
4.					
5.					
6. (**0**) OTHERS (LIST INDIVIDUALLY ON BUDGET JUSTIFICATION PAGE)	0.00	0.00	0.00	**0**	
7. (**1**) TOTAL SENIOR PERSONNEL (1 - 6)	0.00	0.00	0.00	**0**	
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)					
1. (**0**) POST DOCTORAL SCHOLARS	0.00	0.00	0.00	**0**	
2. (**3**) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.)	11.00	0.00	0.00	**96,685**	
3. (**0**) GRADUATE STUDENTS				**0**	
4. (**0**) UNDERGRADUATE STUDENTS				**0**	
5. (**0**) SECRETARIAL - CLERICAL (IF CHARGED DIRECTLY)				**0**	
6. (**0**) OTHER				**0**	
TOTAL SALARIES AND WAGES (A + B)				**96,685**	
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)				**37,843**	
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A + B + C)				**134,528**	
D. EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING $5,000.)					
TOTAL EQUIPMENT				**0**	
E. TRAVEL 1. DOMESTIC (INCL. U.S. POSSESSIONS)				**15,000**	
2. FOREIGN				**0**	
F. PARTICIPANT SUPPORT COSTS					
1. STIPENDS $ **0**					
2. TRAVEL **25,500**					
3. SUBSISTENCE **0**					
4. OTHER **4,500**					
TOTAL NUMBER OF PARTICIPANTS (**120**) TOTAL PARTICIPANT COSTS				**30,000**	
G. OTHER DIRECT COSTS					
1. MATERIALS AND SUPPLIES				**0**	
2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION				**0**	
3. CONSULTANT SERVICES				**0**	
4. COMPUTER SERVICES				**2,475**	
5. SUBAWARDS				**130,000**	
6. OTHER				**0**	
TOTAL OTHER DIRECT COSTS				**132,475**	
H. TOTAL DIRECT COSTS (A THROUGH G)				**312,003**	
I. INDIRECT COSTS (F&A)(SPECIFY RATE AND BASE) **MTDC F&A (Rate: 58.6000, Base: 152003)**					
TOTAL INDIRECT COSTS (F&A)				**89,074**	
J. TOTAL DIRECT AND INDIRECT COSTS (H + I)				**401,077**	
K. SMALL BUSINESS FEE				**0**	
L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K)				**401,077**	
M. COST SHARING PROPOSED LEVEL $ **0** AGREED LEVEL IF DIFFERENT $					

PI/PD NAME **Edward Seidel**	FOR NSF USE ONLY
	INDIRECT COST RATE VERIFICATION
ORG. REP. NAME* **Stephanie Fellmann**	Date Checked | Date Of Rate Sheet | Initials - ORG

2 ***ELECTRONIC SIGNATURES REQUIRED FOR REVISED BUDGET**

SUMMARY
PROPOSAL BUDGET

YEAR 3

	FOR NSF USE ONLY	
ORGANIZATION	PROPOSAL NO.	DURATION (months)
University of Illinois at Urbana-Champaign		Proposed | Granted
PRINCIPAL INVESTIGATOR / PROJECT DIRECTOR	AWARD NO.	
Edward Seidel		

A. SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title, A.7. show number in brackets)	NSF Funded Person-months			Funds Requested By proposer	Funds granted by NSF (if different)
	CAL	ACAD	SUMR		
1.	0.00	0.00	0.00		
2.					
3.					
4.					
5.					
6. (**0**) OTHERS (LIST INDIVIDUALLY ON BUDGET JUSTIFICATION PAGE)	0.00	0.00	0.00	**0**	
7. (**1**) TOTAL SENIOR PERSONNEL (1 - 6)	0.00	0.00	0.00	**0**	
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)					
1. (**0**) POST DOCTORAL SCHOLARS	0.00	0.00	0.00	**0**	
2. (**3**) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.)	11.00	0.00	0.00	**99,586**	
3. (**0**) GRADUATE STUDENTS				**0**	
4. (**0**) UNDERGRADUATE STUDENTS				**0**	
5. (**0**) SECRETARIAL - CLERICAL (IF CHARGED DIRECTLY)				**0**	
6. (**0**) OTHER				**0**	
TOTAL SALARIES AND WAGES (A + B)				**99,586**	
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)				**38,976**	
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A + B + C)				**138,562**	
D. EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING $5,000.)					
TOTAL EQUIPMENT				**0**	
E. TRAVEL 1. DOMESTIC (INCL. U.S. POSSESSIONS)				**14,993**	
2. FOREIGN				**0**	
F. PARTICIPANT SUPPORT COSTS					
1. STIPENDS $ **0**					
2. TRAVEL **15,300**					
3. SUBSISTENCE **0**					
4. OTHER **2,699**					
TOTAL NUMBER OF PARTICIPANTS (**120**) TOTAL PARTICIPANT COSTS				**17,999**	
G. OTHER DIRECT COSTS					
1. MATERIALS AND SUPPLIES				**0**	
2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION				**0**	
3. CONSULTANT SERVICES				**0**	
4. COMPUTER SERVICES				**2,475**	
5. SUBAWARDS				**100,000**	
6. OTHER				**0**	
TOTAL OTHER DIRECT COSTS				**102,475**	
H. TOTAL DIRECT COSTS (A THROUGH G)				**274,029**	
I. INDIRECT COSTS (F&A)(SPECIFY RATE AND BASE)					
MTDC F&A (Rate: 58.6000, Base: 156031)					
TOTAL INDIRECT COSTS (F&A)				**91,434**	
J. TOTAL DIRECT AND INDIRECT COSTS (H + I)				**365,463**	
K. SMALL BUSINESS FEE				**0**	
L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K)				**365,463**	
M. COST SHARING PROPOSED LEVEL $ **0**	AGREED LEVEL IF DIFFERENT $				

PI/PD NAME	FOR NSF USE ONLY		
Edward Seidel	INDIRECT COST RATE VERIFICATION		
ORG. REP. NAME*	Date Checked	Date Of Rate Sheet	Initials - ORG
Stephanie Fellmann			

3 ***ELECTRONIC SIGNATURES REQUIRED FOR REVISED BUDGET**

SUMMARY PROPOSAL BUDGET

Cumulative

			FOR NSF USE ONLY		

ORGANIZATION
University of Illinois at Urbana-Champaign

PROPOSAL NO.	DURATION (months)	
	Proposed	Granted

PRINCIPAL INVESTIGATOR / PROJECT DIRECTOR
Edward Seidel

AWARD NO.

A. SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title, A.7. show number in brackets)	NSF Funded Person-months			Funds Requested By proposer	Funds granted by NSF (if different)
	CAL	ACAD	SUMR		
1.	0.00	0.00	0.00		
2.					
3.					
4.					
5.					
6. ( ) OTHERS (LIST INDIVIDUALLY ON BUDGET JUSTIFICATION PAGE)	0.00	0.00	0.00	**0**	
7. (**0**) TOTAL SENIOR PERSONNEL (1 - 6)	0.00	0.00	0.00	**0**	
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)					
1. (**0**) POST DOCTORAL SCHOLARS	0.00	0.00	0.00	**0**	
2. (**9**) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.)	33.00	0.00	0.00	**290,139**	
3. (**0**) GRADUATE STUDENTS				**0**	
4. (**0**) UNDERGRADUATE STUDENTS				**0**	
5. (**0**) SECRETARIAL - CLERICAL (IF CHARGED DIRECTLY)				**0**	
6. (**0**) OTHER				**0**	
TOTAL SALARIES AND WAGES (A + B)				**290,139**	
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)				**113,559**	
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A + B + C)				**403,698**	
D. EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING $5,000.)					
TOTAL EQUIPMENT				**0**	
E. TRAVEL 1. DOMESTIC (INCL. U.S. POSSESSIONS)				**44,993**	
2. FOREIGN				**0**	
F. PARTICIPANT SUPPORT COSTS					
1. STIPENDS $ **0**					
2. TRAVEL **74,800**					
3. SUBSISTENCE **0**					
4. OTHER **13,199**					
TOTAL NUMBER OF PARTICIPANTS (**480**) TOTAL PARTICIPANT COSTS				**87,999**	
G. OTHER DIRECT COSTS					
1. MATERIALS AND SUPPLIES				**0**	
2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION				**0**	
3. CONSULTANT SERVICES				**0**	
4. COMPUTER SERVICES				**7,425**	
5. SUBAWARDS				**380,000**	
6. OTHER				**0**	
TOTAL OTHER DIRECT COSTS				**387,425**	
H. TOTAL DIRECT COSTS (A THROUGH G)				**924,115**	
I. INDIRECT COSTS (F&A)(SPECIFY RATE AND BASE)					
TOTAL INDIRECT COSTS (F&A)				**325,885**	
J. TOTAL DIRECT AND INDIRECT COSTS (H + I)				**1,250,000**	
K. SMALL BUSINESS FEE				**0**	
L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K)				**1,250,000**	
M. COST SHARING PROPOSED LEVEL $ **0** AGREED LEVEL IF DIFFERENT $					

PI/PD NAME	FOR NSF USE ONLY
Edward Seidel	INDIRECT COST RATE VERIFICATION
ORG. REP. NAME*	Date Checked	Date Of Rate Sheet	Initials - ORG
Stephanie Fellmann			

C ***ELECTRONIC SIGNATURES REQUIRED FOR REVISED BUDGET***

	Project Dollars
A. **Personnel**	**$290,139**

Executive Director - 50% FTE for each year of the project who will oversee the entire MBDH, build partnerships with universities, government organizations, nonprofits, and industry; work to sustain funding; Reports to PI Seidel and SP Nahrstedt, is accountable to the Steering Council.
Project Manager - 2.0 calendar months each year of the project, duties to include managing and tracking activities of the hub, planning events and workshops, organizing and calls, providing summaries of meetings, etc; Reports to Executive Director.
Technical Support/Research Programmer - 3.0 calendar months for each year of the project to provide support in NDS Labs and elsewhere for linking existing data services across the hub, supporting new pilot projects, connecting the environment with sites at other hubs.

Salaries are based on actual UIUC AY2015 rates and are incremented at a rate of 3.0% each year.

B. **Fringe Benefits**	**$113,559**

Fringe benefits are charged at a rate of 39.14% on faculty and postdoc salaries. Benefits include retirement, worker's compensation, health, life and dental insurance, termination, and Medicare.

C. **Travel**	**$44,993**

Support for domestic travel throughout the course of the project is requested for PI and other personnel, especially the Executive Director, to meet with counterparts and attend/present at workshops and conferences related to the project. Anticipate the Executive Director to make 1-2 trips across the hub region per month for the three-year duration of the project; PIs and other key senior personnel to travel to workshops of the MBDH and other hubs, and to national workshops as requested by NSF.

D. **Participant Costs/Workshop**	**$87,999**

As described in the timeline section of the proposal, we anticipate Illinois will host four workshops in Y1, three workshops in Y2, and two workshops in Y3, we expect 60 participants to attend each workshop. Funds requested to cover participant travel and lodging, meals such as breakfast, lunch and dinner, coffee, any AV charges and room rental fees. Any potential and/or unexpected costs necessary to host the workshops.

E. **Other Direct Costs**	**$387,425**

Computer Services: NCSA assesses a standard fee to provide and support computing infrastructure and networking services conducive to the needs of employees working in a high-performance computing environment. Every employee located within NCSA facilities utilizes these infrastructure support services, and these services benefit all NCSA projects unequivocally. The established computer service rate at NCSA is $225.00 per month per employee. A full description of these services is available upon request.

Subawards: Support is requested for the participation of Indiana University, Iowa State University, University of Michigan Ann Arbor, and University of North Dakota. A subaward budget and budget justification are included as separate documents in the proposal.

F.   **Indirect Costs**   **$325,885**
Indirect costs are assessed at a rate of 58.6% of Modified Total Direct Costs (MTDC). MTDC is direct costs less equipment, tuition remission, and subawards in excess of $25,000.

SUMMARY PROPOSAL BUDGET

YEAR   1

				FOR NSF USE ONLY	
ORGANIZATION				PROPOSAL NO.	DURATION (months)
Indiana University					Proposed | Granted
PRINCIPAL INVESTIGATOR / PROJECT DIRECTOR				AWARD NO.	
Beth Plale					

A. SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title, A.7. show number in brackets)	NSF Funded Person-months			Funds Requested By proposer	Funds granted by NSF (if different)
	CAL	ACAD	SUMR		
1.	0.00	0.00	0.00		
2.					
3.					
4.					
5.					
6. (**0**) OTHERS (LIST INDIVIDUALLY ON BUDGET JUSTIFICATION PAGE)	0.00	0.00	0.00	**0**	
7. (**1**) TOTAL SENIOR PERSONNEL (1 - 6)	0.00	0.00	0.00	**0**	
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)					
1. (**0**) POST DOCTORAL SCHOLARS	0.00	0.00	0.00	**0**	
2. (**1**) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.)	1.00	0.00	0.00	**9,351**	
3. (**0**) GRADUATE STUDENTS				**0**	
4. (**0**) UNDERGRADUATE STUDENTS				**0**	
5. (**0**) SECRETARIAL - CLERICAL (IF CHARGED DIRECTLY)				**0**	
6. (**0**) OTHER				**0**	
TOTAL SALARIES AND WAGES (A + B)				**9,351**	
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)				**3,655**	
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A + B + C)				**13,006**	
D. EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING $5,000.)					
TOTAL EQUIPMENT				**0**	
E. TRAVEL 1. DOMESTIC (INCL. U.S. POSSESSIONS)				**11,032**	
2. FOREIGN				**0**	
F. PARTICIPANT SUPPORT COSTS					
1. STIPENDS $ _____ **0**					
2. TRAVEL _____ **0**					
3. SUBSISTENCE _____ **0**					
4. OTHER _____ **0**					
TOTAL NUMBER OF PARTICIPANTS (**0**) TOTAL PARTICIPANT COSTS				**0**	
G. OTHER DIRECT COSTS					
1. MATERIALS AND SUPPLIES				**0**	
2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION				**0**	
3. CONSULTANT SERVICES				**0**	
4. COMPUTER SERVICES				**0**	
5. SUBAWARDS				**0**	
6. OTHER				**0**	
TOTAL OTHER DIRECT COSTS				**0**	
H. TOTAL DIRECT COSTS (A THROUGH G)				**24,038**	
I. INDIRECT COSTS (F&A)(SPECIFY RATE AND BASE)					
MTDC F&A (Rate: 56.0000, Base: 24039)					
TOTAL INDIRECT COSTS (F&A)				**13,462**	
J. TOTAL DIRECT AND INDIRECT COSTS (H + I)				**37,500**	
K. SMALL BUSINESS FEE				**0**	
L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K)				**37,500**	
M. COST SHARING PROPOSED LEVEL $ **0** AGREED LEVEL IF DIFFERENT $					

PI/PD NAME	FOR NSF USE ONLY		
Beth Plale	INDIRECT COST RATE VERIFICATION		
ORG. REP. NAME*	Date Checked	Date Of Rate Sheet	Initials - ORG
Stephanie Fellmann			

1 *ELECTRONIC SIGNATURES REQUIRED FOR REVISED BUDGET

SUMMARY PROPOSAL BUDGET

YEAR 2

	FOR NSF USE ONLY	
	PROPOSAL NO.	DURATION (months)
ORGANIZATION **Indiana University**	AWARD NO.	Proposed / Granted
PRINCIPAL INVESTIGATOR / PROJECT DIRECTOR **Beth Plale**		

A. SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title, A.7. show number in brackets)	NSF Funded Person-months			Funds Requested By proposer	Funds granted by NSF (if different)
	CAL	ACAD	SUMR		
1.	0.00	0.00	0.00		
2.					
3.					
4.					
5.					
6. (**0**) OTHERS (LIST INDIVIDUALLY ON BUDGET JUSTIFICATION PAGE)	0.00	0.00	0.00	**0**	
7. (**1**) TOTAL SENIOR PERSONNEL (1 - 6)	0.00	0.00	0.00	**0**	
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)					
1. (**0**) POST DOCTORAL SCHOLARS	0.00	0.00	0.00	**0**	
2. (**1**) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.)	1.00	0.00	0.00	**9,538**	
3. (**0**) GRADUATE STUDENTS				**0**	
4. (**0**) UNDERGRADUATE STUDENTS				**0**	
5. (**0**) SECRETARIAL - CLERICAL (IF CHARGED DIRECTLY)				**0**	
6. (**0**) OTHER				**0**	
TOTAL SALARIES AND WAGES (A + B)				**9,538**	
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)				**3,825**	
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A + B + C)				**13,363**	
D. EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING $5,000.)					
TOTAL EQUIPMENT				**0**	
E. TRAVEL 1. DOMESTIC (INCL. U.S. POSSESSIONS)				**7,471**	
2. FOREIGN				**0**	
F. PARTICIPANT SUPPORT COSTS					
1. STIPENDS $ **0**					
2. TRAVEL **0**					
3. SUBSISTENCE **0**					
4. OTHER **0**					
TOTAL NUMBER OF PARTICIPANTS (**0**) TOTAL PARTICIPANT COSTS				**0**	
G. OTHER DIRECT COSTS					
1. MATERIALS AND SUPPLIES				**0**	
2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION				**0**	
3. CONSULTANT SERVICES				**0**	
4. COMPUTER SERVICES				**0**	
5. SUBAWARDS				**0**	
6. OTHER				**0**	
TOTAL OTHER DIRECT COSTS				**0**	
H. TOTAL DIRECT COSTS (A THROUGH G)				**20,834**	
I. INDIRECT COSTS (F&A)(SPECIFY RATE AND BASE) **MTDC F&A (Rate: 56.0000, Base: 20833)**					
TOTAL INDIRECT COSTS (F&A)				**11,666**	
J. TOTAL DIRECT AND INDIRECT COSTS (H + I)				**32,500**	
K. SMALL BUSINESS FEE				**0**	
L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K)				**32,500**	
M. COST SHARING PROPOSED LEVEL $ **0** AGREED LEVEL IF DIFFERENT $					

PI/PD NAME **Beth Plale**	FOR NSF USE ONLY
	INDIRECT COST RATE VERIFICATION
ORG. REP. NAME* **Stephanie Fellmann**	Date Checked / Date Of Rate Sheet / Initials - ORG

2 *ELECTRONIC SIGNATURES REQUIRED FOR REVISED BUDGET

				FOR NSF USE ONLY	
ORGANIZATION				PROPOSAL NO.	DURATION (months)
Indiana University					Proposed / Granted
PRINCIPAL INVESTIGATOR / PROJECT DIRECTOR				AWARD NO.	
Beth Plale					

A. SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title, A.7. show number in brackets)	NSF Funded Person-months			Funds Requested By proposer	Funds granted by NSF (if different)
	CAL	ACAD	SUMR		
1.	0.00	0.00	0.00		
2.					
3.					
4.					
5.					
6. (**0**) OTHERS (LIST INDIVIDUALLY ON BUDGET JUSTIFICATION PAGE)	0.00	0.00	0.00	**0**	
7. (**1**) TOTAL SENIOR PERSONNEL (1 - 6)	0.00	0.00	0.00	**0**	
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)					
1. (**0**) POST DOCTORAL SCHOLARS	0.00	0.00	0.00	**0**	
2. (**1**) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.)	1.00	0.00	0.00	**9,729**	
3. (**0**) GRADUATE STUDENTS				**0**	
4. (**0**) UNDERGRADUATE STUDENTS				**0**	
5. (**0**) SECRETARIAL - CLERICAL (IF CHARGED DIRECTLY)				**0**	
6. (**0**) OTHER				**0**	
TOTAL SALARIES AND WAGES (A + B)				**9,729**	
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)				**3,999**	
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A + B + C)				**13,728**	
D. EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING $5,000.)					
TOTAL EQUIPMENT				**0**	
E. TRAVEL 1. DOMESTIC (INCL. U.S. POSSESSIONS)				**2,297**	
2. FOREIGN				**0**	
F. PARTICIPANT SUPPORT COSTS					
1. STIPENDS $ _____ **0**					
2. TRAVEL _____ **0**					
3. SUBSISTENCE _____ **0**					
4. OTHER _____ **0**					
TOTAL NUMBER OF PARTICIPANTS (**0**) TOTAL PARTICIPANT COSTS				**0**	
G. OTHER DIRECT COSTS					
1. MATERIALS AND SUPPLIES				**0**	
2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION				**0**	
3. CONSULTANT SERVICES				**0**	
4. COMPUTER SERVICES				**0**	
5. SUBAWARDS				**0**	
6. OTHER				**0**	
TOTAL OTHER DIRECT COSTS				**0**	
H. TOTAL DIRECT COSTS (A THROUGH G)				**16,025**	
I. INDIRECT COSTS (F&A)(SPECIFY RATE AND BASE)					
MTDC F&A (Rate: 56.0000, Base: 16026)					
TOTAL INDIRECT COSTS (F&A)				**8,975**	
J. TOTAL DIRECT AND INDIRECT COSTS (H + I)				**25,000**	
K. SMALL BUSINESS FEE				**0**	
L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K)				**25,000**	
M. COST SHARING PROPOSED LEVEL $ **0** AGREED LEVEL IF DIFFERENT $					

PI/PD NAME	FOR NSF USE ONLY		
Beth Plale	INDIRECT COST RATE VERIFICATION		
ORG. REP. NAME*	Date Checked	Date Of Rate Sheet	Initials - ORG
Stephanie Fellmann			

3 ***ELECTRONIC SIGNATURES REQUIRED FOR REVISED BUDGET**

SUMMARY
PROPOSAL BUDGET

Cumulative

	FOR NSF USE ONLY	
	PROPOSAL NO.	DURATION (months)
ORGANIZATION **Indiana University**	AWARD NO.	Proposed | Granted
PRINCIPAL INVESTIGATOR / PROJECT DIRECTOR **Beth Plale**		

A. SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title, A.7. show number in brackets)	NSF Funded Person-months			Funds Requested By proposer	Funds granted by NSF (if different)
	CAL	ACAD	SUMR		
1.	0.00	0.00	0.00		
2.					
3.					
4.					
5.					
6. ( ) OTHERS (LIST INDIVIDUALLY ON BUDGET JUSTIFICATION PAGE)	0.00	0.00	0.00	**0**	
7. (**0**) TOTAL SENIOR PERSONNEL (1 - 6)	0.00	0.00	0.00	**0**	
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)					
1. (**0**) POST DOCTORAL SCHOLARS	0.00	0.00	0.00	**0**	
2. (**3**) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.)	3.00	0.00	0.00	**28,618**	
3. (**0**) GRADUATE STUDENTS				**0**	
4. (**0**) UNDERGRADUATE STUDENTS				**0**	
5. (**0**) SECRETARIAL - CLERICAL (IF CHARGED DIRECTLY)				**0**	
6. (**0**) OTHER				**0**	
TOTAL SALARIES AND WAGES (A + B)				**28,618**	
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)				**11,479**	
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A + B + C)				**40,097**	
D. EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING $5,000.)					
TOTAL EQUIPMENT				**0**	
E. TRAVEL 1. DOMESTIC (INCL. U.S. POSSESSIONS)				**20,800**	
2. FOREIGN				**0**	
F. PARTICIPANT SUPPORT COSTS					
1. STIPENDS $ _____ **0**					
2. TRAVEL _____ **0**					
3. SUBSISTENCE _____ **0**					
4. OTHER _____ **0**					
TOTAL NUMBER OF PARTICIPANTS (**0**) TOTAL PARTICIPANT COSTS				**0**	
G. OTHER DIRECT COSTS					
1. MATERIALS AND SUPPLIES				**0**	
2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION				**0**	
3. CONSULTANT SERVICES				**0**	
4. COMPUTER SERVICES				**0**	
5. SUBAWARDS				**0**	
6. OTHER				**0**	
TOTAL OTHER DIRECT COSTS				**0**	
H. TOTAL DIRECT COSTS (A THROUGH G)				**60,897**	
I. INDIRECT COSTS (F&A)(SPECIFY RATE AND BASE)					
TOTAL INDIRECT COSTS (F&A)				**34,103**	
J. TOTAL DIRECT AND INDIRECT COSTS (H + I)				**95,000**	
K. SMALL BUSINESS FEE				**0**	
L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K)				**95,000**	
M. COST SHARING PROPOSED LEVEL $ **0** AGREED LEVEL IF DIFFERENT $					

PI/PD NAME **Beth Plale**	FOR NSF USE ONLY
	INDIRECT COST RATE VERIFICATION
ORG. REP. NAME* **Stephanie Fellmann**	Date Checked | Date Of Rate Sheet | Initials - ORG

C *ELECTRONIC SIGNATURES REQUIRED FOR REVISED BUDGET

Indiana University, BUDGET JUSTIFICATION - Beth Plale PI, Bernice Pescosolido, co-PI

BD Hubs; Midwest: "SEED CORN: Sustainable Enabling Environment fo Dta Collaboration"

Period: (September 1, 2016 through August 31, 2018)

Project Dollars

A. Senior Personnel $ 0

B. Other Personnel $ 28,618
Team member, Valentin Pentchev will be instrumental in working with partner Institutions, including similarly engaged staff at the other 4 lead institutions.   Pentchev's initiatives will include facilitating engagement and collaborations to include promoting and encouraging the organization and sponsorship of workshops and host activities. These activities will foster and establish partnerships through the Midwest Big Data Hub following the main spokes and the corresponding rings of engagement.   One month of salary is requested for Pentchev's efforts for years 1, 2, and 3. All salaries are based on actual University FY2016 rates, and will be escalated at 2 % per year.

C. Fringe Benefits $ 11,480
Fringe benefits are charged at a rate 39.10% on Pentchev's 1 month of calendar salary. Benefits include retirement, worker's compensation, health and life insurance, and Medicare.

D. Equipment $ 0
none

E. Travel $ 20,800
We are planning several domestic trips throughout the Midwest region each year for the purpose of collaboration, sharing of network building strategies, and building of the network.   The cost of each trip is estimated at an average of $ 575 per trip with $ 320 for transportation, $ 155 for lodging, and $ 100 per diem for each one person trip.   The budget for trips of this nature are estimated to be 19 trips Year 1, 14 trips year 2, and 4 trips year 3. A residual of $ 107 is budgeted in year 1 to cover any small increases in fuel costs that might occur for driving trips in year 2 or year 3. The total travel budget is $ 20,800 for 3 years.

F. Participant Support $ 0
No participant support is requested.

G. Other Direct Costs $ 0
No material or supply costs will be budgeted.   Workshops are already planned that facilitate sharing and collaboration on network science, cybersecurity and data ethics and will be advertised to big data hub targets. No funding is sought to support these workshops.

Indirect Costs $ 34,102
A rate of 56.0% of the Modified Direct Cost Total is assessed on direct costs of $ 60,898. Equipment and fee remissions are not included in the modified direct cost total. The overhead rate for on-campus costs for Indiana University was negotiated with the Department of Health and Human Services in an agreement is dated June 20, 2011.
Indirect costs are calculated on $ 60,898 at a rate of 56%.

SUMMARY
PROPOSAL BUDGET

YEAR   1

				FOR NSF USE ONLY		
ORGANIZATION				PROPOSAL NO.	DURATION (months)	
Iowa State University					Proposed	Granted
PRINCIPAL INVESTIGATOR / PROJECT DIRECTOR				AWARD NO.		
Sarah Nusser						

A. SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title, A.7. show number in brackets)	NSF Funded Person-months			Funds Requested By proposer	Funds granted by NSF (if different)
	CAL	ACAD	SUMR		
1.	0.00	0.00	0.00		
2.					
3.					
4.					
5.					
6. (**0**) OTHERS (LIST INDIVIDUALLY ON BUDGET JUSTIFICATION PAGE)	0.00	0.00	0.00	**0**	
7. (**1**) TOTAL SENIOR PERSONNEL (1 - 6)	0.00	0.00	0.00	**0**	
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)					
1. (**0**) POST DOCTORAL SCHOLARS	0.00	0.00	0.00	**0**	
2. (**1**) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.)	1.50	0.00	0.00	**9,887**	
3. (**0**) GRADUATE STUDENTS				**0**	
4. (**0**) UNDERGRADUATE STUDENTS				**0**	
5. (**0**) SECRETARIAL - CLERICAL (IF CHARGED DIRECTLY)				**0**	
6. (**0**) OTHER				**0**	
TOTAL SALARIES AND WAGES (A + B)				**9,887**	
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)				**3,737**	
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A + B + C)				**13,624**	
D. EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING $5,000.)					
TOTAL EQUIPMENT				**0**	
E. TRAVEL 1. DOMESTIC (INCL. U.S. POSSESSIONS)				**1,376**	
2. FOREIGN				**0**	
F. PARTICIPANT SUPPORT COSTS					
1. STIPENDS $ ———————— **0**					
2. TRAVEL ———————— **15,000**					
3. SUBSISTENCE ———————— **0**					
4. OTHER ———————— **0**					
TOTAL NUMBER OF PARTICIPANTS (**50**) TOTAL PARTICIPANT COSTS				**15,000**	
G. OTHER DIRECT COSTS					
1. MATERIALS AND SUPPLIES				**0**	
2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION				**0**	
3. CONSULTANT SERVICES				**0**	
4. COMPUTER SERVICES				**0**	
5. SUBAWARDS				**0**	
6. OTHER				**0**	
TOTAL OTHER DIRECT COSTS				**0**	
H. TOTAL DIRECT COSTS (A THROUGH G)				**30,000**	
I. INDIRECT COSTS (F&A)(SPECIFY RATE AND BASE)					
MTDC F&A (Rate: 50.0000, Base: 15000)					
TOTAL INDIRECT COSTS (F&A)				**7,500**	
J. TOTAL DIRECT AND INDIRECT COSTS (H + I)				**37,500**	
K. SMALL BUSINESS FEE				**0**	
L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K)				**37,500**	
M. COST SHARING PROPOSED LEVEL $ **0** AGREED LEVEL IF DIFFERENT $					

PI/PD NAME	**FOR NSF USE ONLY**	
Sarah Nusser	INDIRECT COST RATE VERIFICATION	
ORG. REP. NAME*	Date Checked Date Of Rate Sheet Initials - ORG	
Stephanie Fellmann		

1   ***ELECTRONIC SIGNATURES REQUIRED FOR REVISED BUDGET**

SUMMARY PROPOSAL BUDGET

YEAR 2

	FOR NSF USE ONLY	
	PROPOSAL NO.	DURATION (months)
ORGANIZATION **Iowa State University**		Proposed / Granted
	AWARD NO.	
PRINCIPAL INVESTIGATOR / PROJECT DIRECTOR **Sarah Nusser**		

A. SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title, A.7. show number in brackets)	NSF Funded Person-months			Funds Requested By proposer	Funds granted by NSF (if different)
	CAL	ACAD	SUMR		
1.	0.00	0.00	0.00		
2.					
3.					
4.					
5.					
6. (**0**) OTHERS (LIST INDIVIDUALLY ON BUDGET JUSTIFICATION PAGE)	0.00	0.00	0.00	**0**	
7. (**1**) TOTAL SENIOR PERSONNEL (1 - 6)	0.00	0.00	0.00	**0**	
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)					
1. (**0**) POST DOCTORAL SCHOLARS	0.00	0.00	0.00	**0**	
2. (**1**) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.)	1.50	0.00	0.00	**10,183**	
3. (**0**) GRADUATE STUDENTS				**0**	
4. (**0**) UNDERGRADUATE STUDENTS				**0**	
5. (**0**) SECRETARIAL - CLERICAL (IF CHARGED DIRECTLY)				**0**	
6. (**0**) OTHER				**0**	
TOTAL SALARIES AND WAGES (A + B)				**10,183**	
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)				**3,849**	
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A + B + C)				**14,032**	
D. EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING $5,000.)					
TOTAL EQUIPMENT				**0**	
E. TRAVEL 1. DOMESTIC (INCL. U.S. POSSESSIONS)				**1,635**	
2. FOREIGN				**0**	
F. PARTICIPANT SUPPORT COSTS					
1. STIPENDS $ **0**					
2. TRAVEL **9,000**					
3. SUBSISTENCE **0**					
4. OTHER **0**					
TOTAL NUMBER OF PARTICIPANTS (**30**) TOTAL PARTICIPANT COSTS				**9,000**	
G. OTHER DIRECT COSTS					
1. MATERIALS AND SUPPLIES				**0**	
2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION				**0**	
3. CONSULTANT SERVICES				**0**	
4. COMPUTER SERVICES				**0**	
5. SUBAWARDS				**0**	
6. OTHER				**0**	
TOTAL OTHER DIRECT COSTS				**0**	
H. TOTAL DIRECT COSTS (A THROUGH G)				**24,667**	
I. INDIRECT COSTS (F&A)(SPECIFY RATE AND BASE) **MTDC F&A (Rate: 50.0000, Base: 15666)**					
TOTAL INDIRECT COSTS (F&A)				**7,833**	
J. TOTAL DIRECT AND INDIRECT COSTS (H + I)				**32,500**	
K. SMALL BUSINESS FEE				**0**	
L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K)				**32,500**	
M. COST SHARING PROPOSED LEVEL $ **0** AGREED LEVEL IF DIFFERENT $					

PI/PD NAME **Sarah Nusser**	FOR NSF USE ONLY
	INDIRECT COST RATE VERIFICATION
ORG. REP. NAME* **Stephanie Fellmann**	Date Checked / Date Of Rate Sheet / Initials - ORG

2 *ELECTRONIC SIGNATURES REQUIRED FOR REVISED BUDGET

SUMMARY PROPOSAL BUDGET

YEAR 3

ORGANIZATION	FOR NSF USE ONLY		
Iowa State University	PROPOSAL NO.	DURATION (months)	
		Proposed	Granted
PRINCIPAL INVESTIGATOR / PROJECT DIRECTOR	AWARD NO.		
Sarah Nusser			

A. SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title, A.7. show number in brackets)	NSF Funded Person-months			Funds Requested By proposer	Funds granted by NSF (if different)
	CAL	ACAD	SUMR		
1.	0.00	0.00	0.00		
2.					
3.					
4.					
5.					
6. (**0**) OTHERS (LIST INDIVIDUALLY ON BUDGET JUSTIFICATION PAGE)	0.00	0.00	0.00	**0**	
7. (**1**) TOTAL SENIOR PERSONNEL (1 - 6)	0.00	0.00	0.00	**0**	
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)					
1. (**0**) POST DOCTORAL SCHOLARS	0.00	0.00	0.00	**0**	
2. (**1**) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.)	1.50	0.00	0.00	**10,489**	
3. (**0**) GRADUATE STUDENTS				**0**	
4. (**0**) UNDERGRADUATE STUDENTS				**0**	
5. (**0**) SECRETARIAL - CLERICAL (IF CHARGED DIRECTLY)				**0**	
6. (**0**) OTHER				**0**	
TOTAL SALARIES AND WAGES (A + B)				**10,489**	
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)				**3,965**	
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A + B + C)				**14,454**	
D. EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING $5,000.)					
TOTAL EQUIPMENT				**0**	
E. TRAVEL 1. DOMESTIC (INCL. U.S. POSSESSIONS)				**2,212**	
2. FOREIGN				**0**	
F. PARTICIPANT SUPPORT COSTS					
1. STIPENDS $ **0**					
2. TRAVEL **0**					
3. SUBSISTENCE **0**					
4. OTHER **0**					
TOTAL NUMBER OF PARTICIPANTS (**0**) TOTAL PARTICIPANT COSTS				**0**	
G. OTHER DIRECT COSTS					
1. MATERIALS AND SUPPLIES				**0**	
2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION				**0**	
3. CONSULTANT SERVICES				**0**	
4. COMPUTER SERVICES				**0**	
5. SUBAWARDS				**0**	
6. OTHER				**0**	
TOTAL OTHER DIRECT COSTS				**0**	
H. TOTAL DIRECT COSTS (A THROUGH G)				**16,666**	
I. INDIRECT COSTS (F&A)(SPECIFY RATE AND BASE)					
MTDC F&A (Rate: 50.0000, Base: 16667)					
TOTAL INDIRECT COSTS (F&A)				**8,334**	
J. TOTAL DIRECT AND INDIRECT COSTS (H + I)				**25,000**	
K. SMALL BUSINESS FEE				**0**	
L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K)				**25,000**	
M. COST SHARING PROPOSED LEVEL $ **0** AGREED LEVEL IF DIFFERENT $					

PI/PD NAME	FOR NSF USE ONLY		
Sarah Nusser	INDIRECT COST RATE VERIFICATION		
ORG. REP. NAME*	Date Checked	Date Of Rate Sheet	Initials - ORG
Stephanie Fellmann			

3 *ELECTRONIC SIGNATURES REQUIRED FOR REVISED BUDGET

SUMMARY
PROPOSAL BUDGET

Cumulative

	FOR NSF USE ONLY	
	PROPOSAL NO.	DURATION (months)
ORGANIZATION **Iowa State University**		Proposed / Granted
PRINCIPAL INVESTIGATOR / PROJECT DIRECTOR **Sarah Nusser**	AWARD NO.	

A. SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title, A.7. show number in brackets)	NSF Funded Person-months			Funds Requested By proposer	Funds granted by NSF (if different)
	CAL	ACAD	SUMR		
1.	0.00	0.00	0.00		
2.					
3.					
4.					
5.					
6. ( ) OTHERS (LIST INDIVIDUALLY ON BUDGET JUSTIFICATION PAGE)	0.00	0.00	0.00	**0**	
7. (**0**) TOTAL SENIOR PERSONNEL (1 - 6)	0.00	0.00	0.00	**0**	
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)					
1. (**0**) POST DOCTORAL SCHOLARS	0.00	0.00	0.00	**0**	
2. (**3**) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.)	4.50	0.00	0.00	**30,559**	
3. (**0**) GRADUATE STUDENTS				**0**	
4. (**0**) UNDERGRADUATE STUDENTS				**0**	
5. (**0**) SECRETARIAL - CLERICAL (IF CHARGED DIRECTLY)				**0**	
6. (**0**) OTHER				**0**	
TOTAL SALARIES AND WAGES (A + B)				**30,559**	
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)				**11,551**	
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A + B + C)				**42,110**	
D. EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING $5,000.)					
TOTAL EQUIPMENT				**0**	
E. TRAVEL 1. DOMESTIC (INCL. U.S. POSSESSIONS)				**5,223**	
2. FOREIGN				**0**	
F. PARTICIPANT SUPPORT COSTS					
1. STIPENDS $ **0**					
2. TRAVEL **24,000**					
3. SUBSISTENCE **0**					
4. OTHER **0**					
TOTAL NUMBER OF PARTICIPANTS (**80**) TOTAL PARTICIPANT COSTS				**24,000**	
G. OTHER DIRECT COSTS					
1. MATERIALS AND SUPPLIES				**0**	
2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION				**0**	
3. CONSULTANT SERVICES				**0**	
4. COMPUTER SERVICES				**0**	
5. SUBAWARDS				**0**	
6. OTHER				**0**	
TOTAL OTHER DIRECT COSTS				**0**	
H. TOTAL DIRECT COSTS (A THROUGH G)				**71,333**	
I. INDIRECT COSTS (F&A)(SPECIFY RATE AND BASE)					
TOTAL INDIRECT COSTS (F&A)				**23,667**	
J. TOTAL DIRECT AND INDIRECT COSTS (H + I)				**95,000**	
K. SMALL BUSINESS FEE				**0**	
L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K)				**95,000**	
M. COST SHARING PROPOSED LEVEL $ **0** AGREED LEVEL IF DIFFERENT $					

PI/PD NAME **Sarah Nusser**	FOR NSF USE ONLY
	INDIRECT COST RATE VERIFICATION
ORG. REP. NAME* **Stephanie Fellmann**	Date Checked / Date Of Rate Sheet / Initials - ORG

C ***ELECTRONIC SIGNATURES REQUIRED FOR REVISED BUDGET**

BUDGET JUSTIFICATION – IOWA STATE UNIVERSITY

Senior Personnel
Dr. Sarah Nusser will serve as the Principal Investigator for the ISU subcontract.

Other Personnel
Salary for Ms. Cheryl Sansgaard is based on the proposed FY16 base salary of $79,094. This salary is requested at 12.5% effort all three years with a 3% base salary increase each year. Ms. Cheryl Sansgaard will be responsible for working with partner institutions (including similar staff at the 4 other lead institutions) to organize and host activities that foster and establish partnerships through MBDH spokes and rings. Part of the responsibilities include hosting 1-2 workshops at Iowa State University to advance the goals of the MBDH.

Fringe Benefits
The fringe benefits are calculated at 37.8% for professional and scientific staff.

Travel
Domestic – One trip is budgeted each year for the PI to attend the annual national meeting associated with the Big Data Hub project. These funds include airfare, ground transportation, lodging, and subsistence.

Participant Support Costs
There will be approximately 50 participants in year 1 and 30 participants in year two that include key note speakers and students from other institutions to take part in a workshop each of the first two years. Travel funds are requested at $300 per participant in each year. This includes airfare and/or ground transportation to/from Iowa State University.

Indirect Costs
Iowa State University's DHHS negotiated on-campus indirect cost rate is 50% of modified total direct costs excluding equipment, tuition allowance, participant support costs, and subcontract amounts exceeding $25,000.

Budget Total Costs per Category

Salary	$30,560
Fringe Benefits	$11,551
Travel	$ 5,223
Participant Support Costs	$24,000
Indirect Costs	$23,666
TOTAL	$95,000

SUMMARY
PROPOSAL BUDGET

YEAR   1

	FOR NSF USE ONLY	
ORGANIZATION **University of Michigan Ann Arbor**	PROPOSAL NO.	DURATION (months)
		Proposed / Granted
PRINCIPAL INVESTIGATOR / PROJECT DIRECTOR **Brian Athey**	AWARD NO.	

A. SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title, A.7. show number in brackets)	NSF Funded Person-months			Funds Requested By proposer	Funds granted by NSF (if different)
	CAL	ACAD	SUMR		
1. **Brian D Athey**	0.00	0.00	0.00	**0**	
2.					
3.					
4.					
5.					
6. (**0**) OTHERS (LIST INDIVIDUALLY ON BUDGET JUSTIFICATION PAGE)	0.00	0.00	0.00	**0**	
7. (**1**) TOTAL SENIOR PERSONNEL (1 - 6)	0.00	0.00	0.00	**0**	
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)					
1. (**0**) POST DOCTORAL SCHOLARS	0.00	0.00	0.00	**0**	
2. (**1**) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.)	1.20	0.00	0.00	**10,000**	
3. (**0**) GRADUATE STUDENTS				**0**	
4. (**0**) UNDERGRADUATE STUDENTS				**0**	
5. (**0**) SECRETARIAL - CLERICAL (IF CHARGED DIRECTLY)				**0**	
6. (**0**) OTHER				**0**	
TOTAL SALARIES AND WAGES (A + B)				**10,000**	
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)				**3,100**	
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A + B + C)				**13,100**	
D. EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING $5,000.)					
TOTAL EQUIPMENT				**0**	
E. TRAVEL 1. DOMESTIC (INCL. U.S. POSSESSIONS)				**3,000**	
2. FOREIGN				**0**	

F. PARTICIPANT SUPPORT COSTS
1. STIPENDS $ ———————— **0**
2. TRAVEL   ———————— **12,545**
3. SUBSISTENCE ———————— **0**
4. OTHER   ———————— **0**

TOTAL NUMBER OF PARTICIPANTS (**0**) TOTAL PARTICIPANT COSTS	**12,545**	
G. OTHER DIRECT COSTS		
1. MATERIALS AND SUPPLIES	**0**	
2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION	**0**	
3. CONSULTANT SERVICES	**0**	
4. COMPUTER SERVICES	**0**	
5. SUBAWARDS	**0**	
6. OTHER	**0**	
TOTAL OTHER DIRECT COSTS	**0**	
H. TOTAL DIRECT COSTS (A THROUGH G)	**28,645**	
I. INDIRECT COSTS (F&A)(SPECIFY RATE AND BASE)		
MTDC F&A (Rate: 55.0000, Base: 16100)		
TOTAL INDIRECT COSTS (F&A)	**8,855**	
J. TOTAL DIRECT AND INDIRECT COSTS (H + I)	**37,500**	
K. SMALL BUSINESS FEE	**0**	
L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K)	**37,500**	
M. COST SHARING PROPOSED LEVEL $ **0** AGREED LEVEL IF DIFFERENT $		

PI/PD NAME **Brian Athey**	FOR NSF USE ONLY		
	INDIRECT COST RATE VERIFICATION		
ORG. REP. NAME* **Stephanie Fellmann**	Date Checked	Date Of Rate Sheet	Initials - ORG

1 *ELECTRONIC SIGNATURES REQUIRED FOR REVISED BUDGET

	FOR NSF USE ONLY	
	PROPOSAL NO.	DURATION (months)
ORGANIZATION		Proposed / Granted
University of Michigan Ann Arbor		
PRINCIPAL INVESTIGATOR / PROJECT DIRECTOR	AWARD NO.	
Brian Athey		

A. SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title, A.7. show number in brackets)	NSF Funded Person-months			Funds Requested By proposer	Funds granted by NSF (if different)
	CAL	ACAD	SUMR		
1.	0.00	0.00	0.00		
2.					
3.					
4.					
5.					
6. (**0**) OTHERS (LIST INDIVIDUALLY ON BUDGET JUSTIFICATION PAGE)	0.00	0.00	0.00	**0**	
7. (**1**) TOTAL SENIOR PERSONNEL (1 - 6)	0.00	0.00	0.00	**0**	
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)					
1. (**0**) POST DOCTORAL SCHOLARS	0.00	0.00	0.00	**0**	
2. (**1**) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.)	1.20	0.00	0.00	**10,300**	
3. (**0**) GRADUATE STUDENTS				**0**	
4. (**0**) UNDERGRADUATE STUDENTS				**0**	
5. (**0**) SECRETARIAL - CLERICAL (IF CHARGED DIRECTLY)				**0**	
6. (**0**) OTHER				**0**	
TOTAL SALARIES AND WAGES (A + B)				**10,300**	
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)				**3,193**	
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A + B + C)				**13,493**	
D. EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING $5,000.)					
TOTAL EQUIPMENT				**0**	
E. TRAVEL 1. DOMESTIC (INCL. U.S. POSSESSIONS)				**1,000**	
2. FOREIGN				**0**	
F. PARTICIPANT SUPPORT COSTS					
1. STIPENDS $ ——————— **0**					
2. TRAVEL ——————— **10,036**					
3. SUBSISTENCE ——————— **0**					
4. OTHER ——————— **0**					
TOTAL NUMBER OF PARTICIPANTS (**0**) TOTAL PARTICIPANT COSTS				**10,036**	
G. OTHER DIRECT COSTS					
1. MATERIALS AND SUPPLIES				**0**	
2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION				**0**	
3. CONSULTANT SERVICES				**0**	
4. COMPUTER SERVICES				**0**	
5. SUBAWARDS				**0**	
6. OTHER				**0**	
TOTAL OTHER DIRECT COSTS				**0**	
H. TOTAL DIRECT COSTS (A THROUGH G)				**24,529**	
I. INDIRECT COSTS (F&A)(SPECIFY RATE AND BASE)					
MTDC F&A (Rate: 55.0000, Base: 14493)					
TOTAL INDIRECT COSTS (F&A)				**7,971**	
J. TOTAL DIRECT AND INDIRECT COSTS (H + I)				**32,500**	
K. SMALL BUSINESS FEE				**0**	
L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K)				**32,500**	
M. COST SHARING PROPOSED LEVEL $ **0** AGREED LEVEL IF DIFFERENT $					

PI/PD NAME	FOR NSF USE ONLY		
Brian Athey	INDIRECT COST RATE VERIFICATION		
ORG. REP. NAME*	Date Checked	Date Of Rate Sheet	Initials - ORG
Stephanie Fellmann			

2 *ELECTRONIC SIGNATURES REQUIRED FOR REVISED BUDGET

SUMMARY
PROPOSAL BUDGET   YEAR   3

	FOR NSF USE ONLY	
	PROPOSAL NO.	DURATION (months)
ORGANIZATION		Proposed	Granted
University of Michigan Ann Arbor			
PRINCIPAL INVESTIGATOR / PROJECT DIRECTOR	AWARD NO.	
Brian Athey		

A. SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title, A.7. show number in brackets)	NSF Funded Person-months			Funds Requested By proposer	Funds granted by NSF (if different)
	CAL	ACAD	SUMR		
1.	0.00	0.00	0.00		
2.					
3.					
4.					
5.					
6. (**0**) OTHERS (LIST INDIVIDUALLY ON BUDGET JUSTIFICATION PAGE)	0.00	0.00	0.00	**0**	
7. (**1**) TOTAL SENIOR PERSONNEL (1 - 6)	0.00	0.00	0.00	**0**	
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)					
1. (**0**) POST DOCTORAL SCHOLARS	0.00	0.00	0.00	**0**	
2. (**1**) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.)	1.20	0.00	0.00	**10,609**	
3. (**0**) GRADUATE STUDENTS				**0**	
4. (**0**) UNDERGRADUATE STUDENTS				**0**	
5. (**0**) SECRETARIAL - CLERICAL (IF CHARGED DIRECTLY)				**0**	
6. (**0**) OTHER				**0**	
TOTAL SALARIES AND WAGES (A + B)				**10,609**	
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)				**3,289**	
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A + B + C)				**13,898**	
D. EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING $5,000.)					
TOTAL EQUIPMENT				**0**	
E. TRAVEL 1. DOMESTIC (INCL. U.S. POSSESSIONS)				**1,000**	
2. FOREIGN				**0**	
F. PARTICIPANT SUPPORT COSTS					
1. STIPENDS $ _____ **0**					
2. TRAVEL _____ **1,908**					
3. SUBSISTENCE _____ **0**					
4. OTHER _____ **0**					
TOTAL NUMBER OF PARTICIPANTS (**0**) TOTAL PARTICIPANT COSTS				**1,908**	
G. OTHER DIRECT COSTS					
1. MATERIALS AND SUPPLIES				**0**	
2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION				**0**	
3. CONSULTANT SERVICES				**0**	
4. COMPUTER SERVICES				**0**	
5. SUBAWARDS				**0**	
6. OTHER				**0**	
TOTAL OTHER DIRECT COSTS				**0**	
H. TOTAL DIRECT COSTS (A THROUGH G)				**16,806**	
I. INDIRECT COSTS (F&A)(SPECIFY RATE AND BASE)					
MTDC F&A (Rate: 55.0000, Base: 14898)					
TOTAL INDIRECT COSTS (F&A)				**8,194**	
J. TOTAL DIRECT AND INDIRECT COSTS (H + I)				**25,000**	
K. SMALL BUSINESS FEE				**0**	
L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K)				**25,000**	
M. COST SHARING PROPOSED LEVEL $ **0** AGREED LEVEL IF DIFFERENT $					

PI/PD NAME	FOR NSF USE ONLY		
Brian Athey	INDIRECT COST RATE VERIFICATION		
ORG. REP. NAME*	Date Checked	Date Of Rate Sheet	Initials - ORG
Stephanie Fellmann			

3 *ELECTRONIC SIGNATURES REQUIRED FOR REVISED BUDGET

SUMMARY
PROPOSAL BUDGET
Cumulative

					FOR NSF USE ONLY	
ORGANIZATION					PROPOSAL NO.	DURATION (months)
University of Michigan Ann Arbor						Proposed | Granted
PRINCIPAL INVESTIGATOR / PROJECT DIRECTOR					AWARD NO.	
Brian Athey						

A. SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title, A.7. show number in brackets)	NSF Funded Person-months			Funds Requested By proposer	Funds granted by NSF (if different)
	CAL	ACAD	SUMR		
1. **Brian D Athey**	0.00	0.00	0.00	**0**	
2.					
3.					
4.					
5.					
6. ( ) OTHERS (LIST INDIVIDUALLY ON BUDGET JUSTIFICATION PAGE)	0.00	0.00	0.00	**0**	
7. (**1**) TOTAL SENIOR PERSONNEL (1 - 6)	0.00	0.00	0.00	**0**	
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)					
1. (**0**) POST DOCTORAL SCHOLARS	0.00	0.00	0.00	**0**	
2. (**3**) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.)	3.60	0.00	0.00	**30,909**	
3. (**0**) GRADUATE STUDENTS				**0**	
4. (**0**) UNDERGRADUATE STUDENTS				**0**	
5. (**0**) SECRETARIAL - CLERICAL (IF CHARGED DIRECTLY)				**0**	
6. (**0**) OTHER				**0**	
TOTAL SALARIES AND WAGES (A + B)				**30,909**	
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)				**9,582**	
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A + B + C)				**40,491**	
D. EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING $5,000.)					
TOTAL EQUIPMENT				**0**	
E. TRAVEL 1. DOMESTIC (INCL. U.S. POSSESSIONS)				**5,000**	
2. FOREIGN				**0**	
F. PARTICIPANT SUPPORT COSTS					
1. STIPENDS $ _____ **0**					
2. TRAVEL _____ **24,489**					
3. SUBSISTENCE _____ **0**					
4. OTHER _____ **0**					
TOTAL NUMBER OF PARTICIPANTS (**0**) TOTAL PARTICIPANT COSTS				**24,489**	
G. OTHER DIRECT COSTS					
1. MATERIALS AND SUPPLIES				**0**	
2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION				**0**	
3. CONSULTANT SERVICES				**0**	
4. COMPUTER SERVICES				**0**	
5. SUBAWARDS				**0**	
6. OTHER				**0**	
TOTAL OTHER DIRECT COSTS				**0**	
H. TOTAL DIRECT COSTS (A THROUGH G)				**69,980**	
I. INDIRECT COSTS (F&A)(SPECIFY RATE AND BASE)					
TOTAL INDIRECT COSTS (F&A)				**25,020**	
J. TOTAL DIRECT AND INDIRECT COSTS (H + I)				**95,000**	
K. SMALL BUSINESS FEE				**0**	
L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K)				**95,000**	
M. COST SHARING PROPOSED LEVEL $ **0** AGREED LEVEL IF DIFFERENT $					

PI/PD NAME	FOR NSF USE ONLY		
Brian Athey	INDIRECT COST RATE VERIFICATION		
ORG. REP. NAME*	Date Checked	Date Of Rate Sheet	Initials - ORG
Stephanie Fellmann			

C ***ELECTRONIC SIGNATURES REQUIRED FOR REVISED BUDGET**

Brian Athey, PhD (0.0 calendar months) – Principal Investigator ($0)
As co-PI for the "BD Hubs: Midwest: "SEEDCorn: Sustainable Enabling Environment for Data Collaboration" (MBDH), Dr. Athey will be part of the Executive Team and member of the MBDH Steering Council. The MBDH Steering Council consists of unpaid representatives from organizations that are actively involved in the governance, agenda setting, and oversight for partnership and shared infrastructure development functions. Dr. Athey will be responsible for ensuring the University of Michigan's active participation in MBDH leadership responsibilities, and the development and implementation of programs and activities that foster partnerships in support of big data innovation. Dr. Athey is Professor and Chair, Department of Computational Medicine & Bioinformatics (DCM&B) at the University of Michigan Medical School. He is Principal investigator of the NIH funded Training Program in Bioinformatics. DCM&B has graduated 55 PhD and 40 MS students since 2005. Dr. Athey serves as co-founder and Chief Science Officer of the tranSMART Foundation, a non-profit organization that coordinates the development of a global open-source data sharing and analytics platform for translational biomedical research. He is the founding Principal Investigator of the NIH Roadmap National Center for Integrative Biomedical Informatics (NCIBI). Dr. Athey has led the National Library of Medicine (NLM) Next-Generation Internet (NGI) Visible Human Project and the DARPA Virtual Soldier Project. He is a key national leader in the NIH Clinical and Translational Science (CTSA) Informatics Community. Dr. Athey is a highly sought after national informatics lecturer with over 90 papers, 165 invited talks, and numerous national advisory boards. He has served as a special advisor to the Defense Sciences Office, DARPA (1994-1999); and to the NIH Office of the Director (OD) and to the NIH Chief Information Officer (CIO) (2007-2010). In 2014, Dr. Athey was elected a Fellow of the American College of Medical Informatics (ACMI).

TBN (1.2 calendar months) – Big Data Hub Coordinator ($30,909 + Fringe Benefits)
Salary for a To Be Named Big Data Hub Coordinator is requested at 10% effort in Years 1-3. The Coordinator will be responsible for working with partner institutions (including similar staff across the five lead institutions) to organize and host activities that foster and establish partnerships through MBDH spokes and rings. This individual will be responsible for organizing "big data" workshops at the University of Michigan to advance the goals of the regional MBDH.

Workshop Participant Travel ($24,489)
Budget support of $12,545 in Year 1, $10,036 in Year 2 and $1,908 in Year 3 is requested for MBDH spoke and ring workshops. These funds will provide limited travel support for participants to attend big data workshops in Healthcare and Life Science, Transportation and Business Analytics hosted by the University of Michigan who otherwise would not be able to attend.

Travel ($5,000)
Budget support of $3,000 in Year 1, $1,000 in Year 2 and $1,000 in Year 3 is requested to support travel costs for University personnel to attend regional and/or national Big Data Hub consortia meetings.

Indirect Costs (25,020)
Effective July 1, 2015, the University of Michigan approved indirect cost rate for federally sponsored on-campus research is 55% of Modified Total Direct Cost (MTDC). The University of Michigan rate agreement is posted at the following url: http://www.finance.umich.edu/programs/indirectcosts
http://www.finance.umich.edu/system/files/FA_Rate_Agreement_May_2013.pdf
Cognizant agency: Department of Health and Human Services, Office of Audit Services, 233 N. Michigan Ave. Suite 1360, Chicago IL, 60601; (312) 886-6432.

SUMMARY PROPOSAL BUDGET

YEAR ___1___

	FOR NSF USE ONLY	
	PROPOSAL NO.	DURATION (months)

ORGANIZATION
University of North Dakota Main Campus

		Proposed	Granted

PRINCIPAL INVESTIGATOR / PROJECT DIRECTOR
Joshua Riedy

AWARD NO.

A. SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title, A.7. show number in brackets)	NSF Funded Person-months			Funds Requested By proposer	Funds granted by NSF (if different)
	CAL	ACAD	SUMR		
1.	0.00	0.00	0.00		
2.					
3.					
4.					
5.					
6. (**0**) OTHERS (LIST INDIVIDUALLY ON BUDGET JUSTIFICATION PAGE)	0.00	0.00	0.00	**0**	
7. (**1**) TOTAL SENIOR PERSONNEL (1 - 6)	0.00	0.00	0.00	**0**	
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)					
1. (**0**) POST DOCTORAL SCHOLARS	0.00	0.00	0.00	**0**	
2. (**1**) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.)	0.85	0.00	0.00	**11,500**	
3. (**0**) GRADUATE STUDENTS				**0**	
4. (**0**) UNDERGRADUATE STUDENTS				**0**	
5. (**0**) SECRETARIAL - CLERICAL (IF CHARGED DIRECTLY)				**0**	
6. (**0**) OTHER				**0**	
TOTAL SALARIES AND WAGES (A + B)				**11,500**	
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)				**4,233**	
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A + B + C)				**15,733**	
D. EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING $5,000.)					
TOTAL EQUIPMENT				**0**	
E. TRAVEL 1. DOMESTIC (INCL. U.S. POSSESSIONS)				**2,800**	
2. FOREIGN				**0**	

F. PARTICIPANT SUPPORT COSTS	
1. STIPENDS $	**0**
2. TRAVEL	**12,369**
3. SUBSISTENCE	**0**
4. OTHER	**0**

TOTAL NUMBER OF PARTICIPANTS (**40**) TOTAL PARTICIPANT COSTS				**12,369**	
G. OTHER DIRECT COSTS					
1. MATERIALS AND SUPPLIES				**0**	
2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION				**0**	
3. CONSULTANT SERVICES				**0**	
4. COMPUTER SERVICES				**0**	
5. SUBAWARDS				**0**	
6. OTHER				**0**	
TOTAL OTHER DIRECT COSTS				**0**	
H. TOTAL DIRECT COSTS (A THROUGH G)				**30,902**	
I. INDIRECT COSTS (F&A)(SPECIFY RATE AND BASE)					
MTDC F&A (Rate: 35.6000, Base: 18533)					
TOTAL INDIRECT COSTS (F&A)				**6,598**	
J. TOTAL DIRECT AND INDIRECT COSTS (H + I)				**37,500**	
K. SMALL BUSINESS FEE				**0**	
L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K)				**37,500**	
M. COST SHARING PROPOSED LEVEL $ **0** AGREED LEVEL IF DIFFERENT $					

PI/PD NAME	FOR NSF USE ONLY
Joshua Riedy	INDIRECT COST RATE VERIFICATION
ORG. REP. NAME*	Date Checked	Date Of Rate Sheet	Initials - ORG
Stephanie Fellmann			

1 *ELECTRONIC SIGNATURES REQUIRED FOR REVISED BUDGET

SUMMARY
PROPOSAL BUDGET

YEAR 2

			FOR NSF USE ONLY	
ORGANIZATION			PROPOSAL NO.	DURATION (months)
University of North Dakota Main Campus				Proposed / Granted
PRINCIPAL INVESTIGATOR / PROJECT DIRECTOR			AWARD NO.	
Joshua Riedy				

A. SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title, A.7. show number in brackets)	NSF Funded Person-months			Funds Requested By proposer	Funds granted by NSF (if different)
	CAL	ACAD	SUMR		
1.	0.00	0.00	0.00		
2.					
3.					
4.					
5.					
6. (**0**) OTHERS (LIST INDIVIDUALLY ON BUDGET JUSTIFICATION PAGE)	0.00	0.00	0.00	**0**	
7. (**1**) TOTAL SENIOR PERSONNEL (1 - 6)	0.00	0.00	0.00	**0**	
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)					
1. (**0**) POST DOCTORAL SCHOLARS	0.00	0.00	0.00	**0**	
2. (**1**) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.)	0.85	0.00	0.00	**11,845**	
3. (**0**) GRADUATE STUDENTS				**0**	
4. (**0**) UNDERGRADUATE STUDENTS				**0**	
5. (**0**) SECRETARIAL - CLERICAL (IF CHARGED DIRECTLY)				**0**	
6. (**0**) OTHER				**0**	
TOTAL SALARIES AND WAGES (A + B)				**11,845**	
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)				**4,360**	
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A + B + C)				**16,205**	
D. EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING $5,000.)					
TOTAL EQUIPMENT				**0**	
E. TRAVEL 1. DOMESTIC (INCL. U.S. POSSESSIONS)				**2,800**	
2. FOREIGN				**0**	

F. PARTICIPANT SUPPORT COSTS
1. STIPENDS $———————————— **0**
2. TRAVEL   ———————————— **6,729**
3. SUBSISTENCE   ———————————— **0**
4. OTHER   ———————————— **0**

TOTAL NUMBER OF PARTICIPANTS (**20**) TOTAL PARTICIPANT COSTS				**6,729**	
G. OTHER DIRECT COSTS					
1. MATERIALS AND SUPPLIES				**0**	
2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION				**0**	
3. CONSULTANT SERVICES				**0**	
4. COMPUTER SERVICES				**0**	
5. SUBAWARDS				**0**	
6. OTHER				**0**	
TOTAL OTHER DIRECT COSTS				**0**	
H. TOTAL DIRECT COSTS (A THROUGH G)				**25,734**	
I. INDIRECT COSTS (F&A)(SPECIFY RATE AND BASE)					
MTDC F&A (Rate: 35.6000, Base: 19005)					
TOTAL INDIRECT COSTS (F&A)				**6,766**	
J. TOTAL DIRECT AND INDIRECT COSTS (H + I)				**32,500**	
K. SMALL BUSINESS FEE				**0**	
L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K)				**32,500**	
M. COST SHARING PROPOSED LEVEL $ **0** AGREED LEVEL IF DIFFERENT $					

PI/PD NAME	FOR NSF USE ONLY		
Joshua Riedy	INDIRECT COST RATE VERIFICATION		
ORG. REP. NAME*	Date Checked	Date Of Rate Sheet	Initials - ORG
Stephanie Fellmann			

2 ***ELECTRONIC SIGNATURES REQUIRED FOR REVISED BUDGET**

SUMMARY
PROPOSAL BUDGET

YEAR 3

		FOR NSF USE ONLY	
ORGANIZATION **University of North Dakota Main Campus**		PROPOSAL NO.	DURATION (months)
			Proposed | Granted
PRINCIPAL INVESTIGATOR / PROJECT DIRECTOR **Joshua Riedy**		AWARD NO.	

A. SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title, A.7. show number in brackets)	NSF Funded Person-months			Funds Requested By proposer	Funds granted by NSF (if different)
	CAL	ACAD	SUMR		
1.	0.00	0.00	0.00		
2.					
3.					
4.					
5.					
6. (**0**) OTHERS (LIST INDIVIDUALLY ON BUDGET JUSTIFICATION PAGE)	0.00	0.00	0.00	**0**	
7. (**1**) TOTAL SENIOR PERSONNEL (1 - 6)	0.00	0.00	0.00	**0**	
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)					
1. (**0**) POST DOCTORAL SCHOLARS	0.00	0.00	0.00	**0**	
2. (**1**) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.)	0.85	0.00	0.00	**12,200**	
3. (**0**) GRADUATE STUDENTS				**0**	
4. (**0**) UNDERGRADUATE STUDENTS				**0**	
5. (**0**) SECRETARIAL - CLERICAL (IF CHARGED DIRECTLY)				**0**	
6. (**0**) OTHER				**0**	
TOTAL SALARIES AND WAGES (A + B)				**12,200**	
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)				**4,491**	
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A + B + C)				**16,691**	
D. EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING $5,000.)					
TOTAL EQUIPMENT				**0**	
E. TRAVEL 1. DOMESTIC (INCL. U.S. POSSESSIONS)				**1,746**	
2. FOREIGN				**0**	
F. PARTICIPANT SUPPORT COSTS					
1. STIPENDS $ _____ **0**					
2. TRAVEL _____ **0**					
3. SUBSISTENCE _____ **0**					
4. OTHER _____ **0**					
TOTAL NUMBER OF PARTICIPANTS (**0**) TOTAL PARTICIPANT COSTS				**0**	
G. OTHER DIRECT COSTS					
1. MATERIALS AND SUPPLIES				**0**	
2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION				**0**	
3. CONSULTANT SERVICES				**0**	
4. COMPUTER SERVICES				**0**	
5. SUBAWARDS				**0**	
6. OTHER				**0**	
TOTAL OTHER DIRECT COSTS				**0**	
H. TOTAL DIRECT COSTS (A THROUGH G)				**18,437**	
I. INDIRECT COSTS (F&A)(SPECIFY RATE AND BASE)					
MTDC F&A (Rate: 35.6000, Base: 18436)					
TOTAL INDIRECT COSTS (F&A)				**6,563**	
J. TOTAL DIRECT AND INDIRECT COSTS (H + I)				**25,000**	
K. SMALL BUSINESS FEE				**0**	
L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K)				**25,000**	
M. COST SHARING PROPOSED LEVEL $ **0**	AGREED LEVEL IF DIFFERENT $				

PI/PD NAME	FOR NSF USE ONLY		
Joshua Riedy	INDIRECT COST RATE VERIFICATION		
ORG. REP. NAME*	Date Checked	Date Of Rate Sheet	Initials - ORG
Stephanie Fellmann			

3 ***ELECTRONIC SIGNATURES REQUIRED FOR REVISED BUDGET**

SUMMARY
PROPOSAL BUDGET

Cumulative

		FOR NSF USE ONLY		
ORGANIZATION **University of North Dakota Main Campus**		PROPOSAL NO.	DURATION (months)	
			Proposed	Granted
PRINCIPAL INVESTIGATOR / PROJECT DIRECTOR **Joshua Riedy**		AWARD NO.		

A. SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title, A.7. show number in brackets)	NSF Funded Person-months			Funds Requested By proposer	Funds granted by NSF (if different)
	CAL	ACAD	SUMR		
1.	0.00	0.00	0.00		
2.					
3.					
4.					
5.					
6. ( ) OTHERS (LIST INDIVIDUALLY ON BUDGET JUSTIFICATION PAGE)	0.00	0.00	0.00	**0**	
7. (**0**) TOTAL SENIOR PERSONNEL (1 - 6)	0.00	0.00	0.00	**0**	
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)					
1. (**0**) POST DOCTORAL SCHOLARS	0.00	0.00	0.00	**0**	
2. (**3**) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.)	2.55	0.00	0.00	**35,545**	
3. (**0**) GRADUATE STUDENTS				**0**	
4. (**0**) UNDERGRADUATE STUDENTS				**0**	
5. (**0**) SECRETARIAL - CLERICAL (IF CHARGED DIRECTLY)				**0**	
6. (**0**) OTHER				**0**	
TOTAL SALARIES AND WAGES (A + B)				**35,545**	
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)				**13,084**	
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A + B + C)				**48,629**	
D. EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING $5,000.)					
TOTAL EQUIPMENT				**0**	
E. TRAVEL 1. DOMESTIC (INCL. U.S. POSSESSIONS)				**7,346**	
2. FOREIGN				**0**	
F. PARTICIPANT SUPPORT COSTS					
1. STIPENDS $ _____ **0**					
2. TRAVEL _____ **19,098**					
3. SUBSISTENCE _____ **0**					
4. OTHER _____ **0**					
TOTAL NUMBER OF PARTICIPANTS (**60**) TOTAL PARTICIPANT COSTS				**19,098**	
G. OTHER DIRECT COSTS					
1. MATERIALS AND SUPPLIES				**0**	
2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION				**0**	
3. CONSULTANT SERVICES				**0**	
4. COMPUTER SERVICES				**0**	
5. SUBAWARDS				**0**	
6. OTHER				**0**	
TOTAL OTHER DIRECT COSTS				**0**	
H. TOTAL DIRECT COSTS (A THROUGH G)				**75,073**	
I. INDIRECT COSTS (F&A)(SPECIFY RATE AND BASE)					
TOTAL INDIRECT COSTS (F&A)				**19,927**	
J. TOTAL DIRECT AND INDIRECT COSTS (H + I)				**95,000**	
K. SMALL BUSINESS FEE				**0**	
L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K)				**95,000**	
M. COST SHARING PROPOSED LEVEL $ **0** AGREED LEVEL IF DIFFERENT $					

PI/PD NAME **Joshua Riedy**	FOR NSF USE ONLY
	INDIRECT COST RATE VERIFICATION
ORG. REP. NAME* **Stephanie Fellmann**	Date Checked	Date Of Rate Sheet	Initials - ORG

C *ELECTRONIC SIGNATURES REQUIRED FOR REVISED BUDGET

UNIVERSITY OF NORTH DAKOTA
BUDGET JUSTIFICATION
Principal Investigator: Joshua Riedy
Period: September 1, 2015-August 31, 2018

		Project Dollars

A. Senior Personnel   NA

No Senior Personnel are funded under this budget.

B. Other Personnel $35,545

Funding will be used as salary and fringes for a part-time UND MBDH project coordinator. The duties of the project coordinator will be assigned to the University of North Dakota (UND) Campus Champion to the eXtreme Science and Engineering Discovery Environment (XSEDE) organization, who is also the regional Campus Champion for XSEDE Region 3 (ND, SD, MN, WI, IA, and IL). The coordinator will organize UND-hosted MBDH workshops, events, and activities as well as assist with governance, outreach, and education as directed by the UND Co-PI. This position will provide a minimum of 0.85 of one month of effort toward the MDBH project each year.

C. Fringe Benefits $13,084

Fringe benefits are charged at a rate of 36.81% on faculty and postdoc salaries. Benefits include retirement, worker's compensation, health, life and dental insurance, termination, and Medicare.

D. Equipment   NA

No equipment purchases will be funded under this budget.

E. Travel $7,345

Support for domestic travel throughout the course of the project is requested for Dr. Joshua Riedy UND PI and the Project Coordinator to attend MBDH workshops/events and the annual NSF PI BD Hubs meeting.

F. Participant Costs/Workshop $19,098

UND will host minimum of three workshop/summits/events over the course of the three year award period, two events in the first year of the award, and one in the second year of the award. This funding will be used to provide approximately 20 attendees of each event with approximately $300 of Participant Support. The actual amount may be slightly more or less than $300 depending upon attendee need. This will allow us to support 60 event attendees over the course of the first two years of the award. These events will allow us to bring together researchers, regional partners, and key stakeholders to discuss MBDH issues surrounding governance, outreach, and education issues to better set policy and set the direction of the hub.

G. Other Direct Costs   NA

No other direct costs will be funded under this budget.

I. Indirect Costs $19,927

Indirect costs are assessed at a rate of 35.6% of Modified Total Direct Costs (MTDC). MTDC is direct costs less equipment, tuition remission, and subawards in excess of $25,000.

Current and Pending Support
(See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator: Harry Seidel	Other agencies (including NSF) to which this proposal has been/will be submitted. none

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Cyprus Collaboration and Research Agreement

Source of Support: Cyprus Institute Limited

Total Award Amount: $5,000,000   Total Award Period Covered: 9/1/2009-8/31/2016

Location of Project: University of Illinois Urbana-Champaign

Person-Months Per Year Committed to the Project.   Cal: 0.00   Acad: Sumr:

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

CC*DNI DIBBS: Merging Science and Cyberinfrastructure Pathways: The Whole Tale

Source of Support: NSF

Total Award Amount: $4,986,951   Total Award Period Covered: 1/1/2016-12/31/2020

Location of Project: University of Illinois Urbana-Champaign

Person-Months Per Year Committed to the Project.   0.0   Cal: 0.0   Acad: 0.0   Sumr: 0.0

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

BD Hubs: MIDWEST: SEEDCorn: Sustainable Enabling Environment for Data Collaboration

(this proposal)

Source of Support: NSF

Total Award Amount: $1,250,000   Total Award Period Covered: 9/1/15-8/31/18

Location of Project: University of Illinois Urbana-Champaign

Person-Months Per Year Committed to the Project.   0.0   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

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*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

NSF Form 1239 (10/99)   USE ADDITIONAL SHEETS AS NECESSARY

Current and Pending Support

(See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator: Brian Athey	Other agencies (including NSF) to which this proposal has been/will be

Support: ⊠ Current   ☐ Pending   ☐ Submission Planned in Near Future   ☐ *Transfer of Support

Project/Proposal Title: Training Program in Bioinformatics

Source of Support: NIH

Total Award Amount: $883,760   Total Award Period Covered: 07/01/2011 – 06/30/2016

Location of Project: University of Michigan

Person-Months Per Year Committed to the Project.   Cal: 1.2   Acad: Sumr:

Support: ⊠ Current   ☐ Pending   ☐ Submission Planned in Near Future   ☐ *Transfer of Support

Project/Proposal Title: Michigan Institute for Clinical and Health Research (MICHR)

Source of Support: NIH/NCATS

Total Award Amount: $ 48,788,667   Total Award Period Covered: 06/01/2012 – 05/31/2017

Location of Project: University of Michigan

Person-Months Per Year Committed to the Project.   Cal: 1.2   Acad: Sumr:

Support: ⊠ Current   ☐ Pending   ☐ Submission Planned in Near Future   ☐ *Transfer of Support

Project/Proposal Title: Michigan Regional Comprehensive Metabolomics Research Core

Source of Support: NIH NIDDK

Total Award Amount: $ 9,170,679   Total Award Period Covered: 09/01/2012 – 08/31/2017

Location of Project: University of Michigan

Person-Months Per Year Committed to the Project.   Cal: .6   Acad: Sumr:

Support: ⊠ Current   ☐ Pending   ☐ Submission Planned in Near Future   ☐ *Transfer of Support

Project/Proposal Title: Transforming Research and Clinical Knowledge in Traumatic Brain Injury II (TRACK-TBI II)

Source of Support: NIH

Total Award Amount: $139,738   Total Award Period Covered: 09/01/2013 – 08/31/2018

Location of Project: University of Michigan

Person-Months Per Year Committed to the Project.   Cal: 0.0   Acad: Sumr:

Support: ☐ Current   ⊠ Pending   ☐ Submission Planned in Near Future   ☐ *Transfer of Support

Project/Proposal Title: Creating an Infrastructure to Promote Data Sharing Among Biomedical Researchers

Source of Support: ICF International/NIH

Total Award Amount: $ Total Award Period Covered: 09/01/2014 – 08/31/2017

Location of Project: University of Michigan

Person-Months Per Year Committed to the Project.   Cal: 1.2   Acad: Sumr:

*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

NSF Form 1239 (10/99)   USE ADDITIONAL SHEETS AS NECESSARY

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Current and Pending Support

(See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.	
Investigator: Brian Athey	Other agencies (including NSF) to which this proposal has been/will be

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: Supporting the Open Science tranSMART Community

Source of Support: tranSMART Foundation

Total Award Amount: $166,738   Total Award Period Covered: 12/01/2014 – 11/30/2015

Location of Project: University of Michigan

Person-Months Per Year Committed to the Project.   Cal: 0.0   Acad: Sumr:

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: Open Resources for Big Data Education (ORBIDE)

Source of Support: ORBIDE

Total Award Amount: 641,229   Total Award Period Covered: 12/01/2014 – 11/30/2017

Location of Project: University of Michigan

Person-Months Per Year Committed to the Project.   Cal: 0.6   Acad: Sumr:

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: High-throughput Analytics of Heterogeneous Big Data

Source of Support: NIH/NIGMS

Total Award Amount: $1,321,382   Total Award Period Covered: 04/01/2015 – 03/31/2018

Location of Project: University of Michigan

Person-Months Per Year Committed to the Project.   Cal: 0.9   Acad: Sumr:

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: BD Hubs: Midwest: "SEEDCORN: Sustainable Enabling Environment for Data Collaboration (This Proposal)

Source of Support: NSF

Total Award Amount: $95,000   Total Award Period Covered: 09/01/2015 – 08/31/2018

Location of Project: University of Michigan

Person-Months Per Year Committed to the Project.   Cal: 0.0   Acad: Sumr:

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: Training Program in Bioinformatics

Source of Support: NIH

Total Award Amount: $2,936,607   Total Award Period Covered: 07/01/2016 – 06/30/2021

Location of Project: University of Michigan

Person-Months Per Year Committed to the Project.   Cal: 1.2   Acad: Sumr:

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*If this project has previously been funded by another agency, please list and furnish information for immediately pre-ceding funding period.

Current and Pending Support
(See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.	
Investigator: Sarah M. Nusser	Other agencies (including NSF) to which this proposal has been/will be submitted. None

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

BD Hubs: Midwest: SEEDCorn: Sustainable Enabling Environment for Data Collaboration

(this proposal)

Source of Support: NSF

Total Award Amount: $95,000   Total Award Period Covered: 9/1/15-8/31/18

Location of Project: Iowa State University

Person-Months Per Year Committed to the Project.   0   Cal: 0   Acad: 0   Sumr: 0

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Effects of Community Assets on Rural Business Development

Source of Support: USDA

Total Award Amount: $689,879   Total Award Period Covered: 9/28/10-9/30/15

Location of Project: Iowa State University

Person-Months Per Year Committed to the Project.   0   Cal: 0   Acad: 0   Sumr: 0

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

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*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

NSF Form 1239 (10/99)   USE ADDITIONAL SHEETS AS NECESSARY

Current and Pending Support
See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator: Beth Plale	Other agencies (including NSF) to which this proposal has been/will be submitted.
	None

Support: ☒ Current   ☐ Pending   ☐ Submission Planned in Near Future   ☐ *Transfer of Support

Project/Proposal Title: DataNet: Sustainable Environment Actionable Data (SEAD)

PI: Beth Plale

Source of Support: University of Michigan 3002083949, NSF

Total Award Amount: $1,655,111   Total Award Period Covered: 10/1/11 – 9/30/16

Location of Project: Indiana University, Bloomington

Person-Months Per Year Committed to the Project.   Cal: Acad: .50   Sumr: .50

Support: ☒ Current   ☐ Pending   ☐ Submission Planned in Near Future   ☐ *Transfer of Support

Project/Proposal Title: WSC-Category 2 Collaborative: Impacts of Agriculture Decision Making and Adaptive Management on Food Security in Africa

PI: Tom Evans, Co-PI: Beth Plale

Source of Support: National Science Foundation SES-1360463

Total Award Amount: $ 6,074,920   Total Award Period Covered: 9/1/14 – 08/31/19

Location of Project: Indiana University, Bloomington

Person-Months Per Year Committed to the Project.   Cal: Acad: .50   Sumr:

Support: ☒ Current   ☐ Pending   ☐ Submission Planned in Near Future   ☐ *Transfer of Support

Project/Proposal Title:

SAVI: PRAGMA - Enabling Scientific Expeditions and Infrastructure Experimentation for Pacific Rim

IU PI Beth Plale

Source of Support: University of California, San Deige 33529192, NSF

Total Award Amount: $369,026   Total Award Period Covered: 10/1/02 – 09/30/17

Location of Project: Indiana University

Person-Months Per Year Committed to the Project.   Cal: Acad: .50   Sumr: .50

Support: ☒ Current   ☐ Pending   ☐ Submission Planned in Near Future   ☐ *Transfer of Support

Project/Proposal Title:

Building the Research Data Alliance Community through US and International Engagement (RDA2)

PI: Beth Plale

Source of Support: Rensselaer Polytech A12551

Total Award Amount: $5,771,681   Total Award Period Covered: 10/1/13 – 9/30/18

Location of Project: Indiana University

Person-Months Per Year Committed to the Project.   Cal: Acad: 1.50   Sumr: .00

Support: ☒ Current   ☐ Pending   ☐ Submission Planned in Near Future   ☐ *Transfer of Support

Project/Proposal Title:
Workset Creation for Scholarly Analysis: Prototyping Project
PI: Beth Plale

Source of Support: University of Illinois 3013-05160-02 (Mellon)

Total Award Amount: $15,462   Total Award Period Covered: 7/1/13 – 9/30/15

Location of Project: Indiana University

Person-Months Per Year Committed to the Project.   Cal: Acad: .05   Sumr:

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*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

NSF Form 1239 (7/95)   USE ADDITIONAL SHEETS AS NECESSARY

Current and Pending Support

See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator: Beth Plale	Other agencies (including NSF) to which this proposal has been/will be submitted. None

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: HathiTrust Research Center: Computation Research on the HathiTrust Repository Phase 1
PI: Beth Plale, Illinois Co-PI: Stephen Downie

Source of Support: HathiTrust

Total Award Amount: $999,524   Total Award Period Covered: 07/01/14-06/30/18

Location of Project: Indiana University and University of Illinois

Person-Months Per Year Committed to the Project.   Cal: Acad: 1.0   Sumr: .25

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: RDA Data Share

Alfred P. Sloan

PI: Beth Plale, Co-PI: Inna Kouper, Rensselaer Polytech Co PI: Kathy Fontaine
Source of Support: Alfred P. Sloan Foundation

Total Award Amount: $748,000   Total Award Period Covered: 01/01/15 – 12/31/17

Location of Project: : Indiana University and Rensselaer Polytech

Person-Months Per Year Committed to the Project.   Cal: Acad: .25   Sumr: .25

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: Enhancing Predictive Capability of Social Ecological Systems Research

Source of Support: Indiana University

Total Award Amount: $73,317   Total Award Period Covered: 3/1/14 – 8/30/15

Location of Project: Indiana University

Person-Months Per Year Committed to the Project.   Cal: Acad: .05   Sumr:

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:
BD Hubs: Midwest: "SEEDCorn: Sustainable Enabling Environment for Data Collaboration" **< This Proposal**

Source of Support: NSF

Total Award Amount: $95,000   Total Award Period Covered: 09/01/15-08/31/18

Location of Project: Muli-site, University of Illinois, Urbana-Champaign, lead

Person-Months Per Year Committed to the Project.   Cal: Acad: .00   Sumr:

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: BIGDATA: Collaborative Research: F: Removing barriers to text analytics of sensitive data: a security and privacy enabled research data commons

Source of Support: National Science Foundation

Total Award Amount: $ 1,222,705   Total Award Period Covered: 01/01/16 – 12/31/19

Location of Project: Indiana University, Bloomington

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr: 0.50

*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

Current and Pending Support
(See GPG Section II.C.2.h for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator: Beth Plale

Other agencies (including NSF) to which this proposal has been/will be submitted.

Support: Current   Pending   Submission Planned in Near Future   *Transfer of Support

Project/Proposal Title: Addressing the Needs of the Small Research Group with
                          Cyberinfrastructure Centers of Expertise

Source of Support: NSF
Total Award Amount: $ 42,243 Total Award Period Covered: 07/01/15 - 06/30/16
Location of Project: Indiana University, Bloomington
Person-Months Per Year Committed to the Project.   Cal:0.00   Acad: 0.02   Sumr: 0.00

Support: Current   Pending   Submission Planned in Near Future   *Transfer of Support

Project/Proposal Title:

Source of Support:
Total Award Amount: $ Total Award Period Covered:
Location of Project:
Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: Current   Pending   Submission Planned in Near Future   *Transfer of Support

Project/Proposal Title:

Source of Support:
Total Award Amount: $ Total Award Period Covered:
Location of Project:
Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: Current   Pending   Submission Planned in Near Future   *Transfer of Support

Project/Proposal Title:

Source of Support:
Total Award Amount: $ Total Award Period Covered:
Location of Project:
Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: Current   Pending   Submission Planned in Near Future   *Transfer of Support

Project/Proposal Title:

Source of Support:
Total Award Amount: $ Total Award Period Covered:
Location of Project:
Person-Months Per Year Committed to the Project.   Cal: Acad: Summ:

*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

Current and Pending Support
(See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator: Joshua Riedy	Other agencies (including NSF) to which this proposal has been/will be submitted.

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Integrated Counseling and Advising Network

Source of Support: Educause

Total Award Amount: $225,000   Total Award Period Covered: 8/13/15-6/30/18

Location of Project: UND

Person-Months Per Year Committed to the Project.   0.0   Cal: Acad: Sumr:

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

BD Hubs: Midwest: SEEDCorn: Sustainable Enabling Environment for Data Collaboration

(this proposal)

Source of Support: University of Illinois (NSF Prime)

Total Award Amount: $95,000   Total Award Period Covered: 9/1/15-8/31/18

Location of Project: UND

Person-Months Per Year Committed to the Project.   0.0   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

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*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

NSF Form 1239 (10/99)   USE ADDITIONAL SHEETS AS NECESSARY

Current and Pending Support
(See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator: Gabrielle Allen	Other agencies (including NSF) to which this proposal has been/will be submitted.
	None

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

The 2nd Workshop on Sustainable Software: Best Practices and Experiences (WSSSPE 2)

Source of Support: NSF

Total Award Amount: $24,758   Total Award Period Covered: 04/01/2014 - 04/30/2016

Location of Project: University of Illinois at Urbana-Champaign

Person-Months Per Year Committed to the Project.   0.0   Cal: 0.00   Acad: 0.0   Sumr: 0.0

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

CC*DNI DIBBS: Merging Science and Cyberinfrastructure Pathways: The Whole Tale

Source of Support: NSF

Total Award Amount: $5,000,000   Total Award Period Covered: 1/1/2016-12/31/2020

Location of Project: University of Illinois Urbana Champaign

Person-Months Per Year Committed to the Project.   0.0   Cal: 0.00   Acad: 0.0   Sumr: 0.00

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Collaborative Research: Immersive Numerical Laboratories: Analysis-Driven Supercomputing

Source of Support: NSF

Total Award Amount: $1,714,042   Total Award Period Covered: 10/1/15-9/30/20

Location of Project: University of Illinois Urbana Champaign

Person-Months Per Year Committed to the Project.   Cal: 0.50   Acad: Sumr:

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

DOE/BES Computational Materials Sciences: Materials Computation Center for Predictive Nanomaterial Simulation

Source of Support: DOE

Total Award Amount: $9,811,725   Total Award Period Covered: 9/1/15-8/30/19

Location of Project: University of Illinois Urbana Champaign

Person-Months Per Year Committed to the Project.   Cal: 0.50   Acad: Sumr:

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

PIRE: Integrated Computational Materials Engineering for Active Materials and Interfaces in Chemical Fuel Production

Source of Support: NSF

Total Award Amount: $4,748,694   Total Award Period Covered: 11/16/16-11/15/19

Location of Project: University of Illinois Urbana Champaign

Person-Months Per Year Committed to the Project.   Cal: 0.25   Acad: Sumr:

*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

NSF Form 1239 (10/99)   USE ADDITIONAL SHEETS AS NECESSARY

Current and Pending Support
(See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.	
Investigator: Gabrielle Allen	Other agencies (including NSF) to which this proposal has been/will be submitted.

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

BD Hubs: MIDWEST: SEEDCorn: Sustainable Enabling Environment for Data Collaboration

(this proposal)

Source of Support: NSF

Total Award Amount: $1,250,000   Total Award Period Covered: 9/1/15-8/31/18

Location of Project: University of Illinois Urbana Champaign

Person-Months Per Year Committed to the Project.   0.0   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

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*If this project has previously been funded by another agency, please list and furnish information for immediately pre-ceding funding period.

NSF Form 1239 (10/99)   USE ADDITIONAL SHEETS AS NECESSARY

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Current and Pending Support
(See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator: Ravi Bapna

Other agencies (including NSF) to which this proposal has been/will be submitted.

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

BD Hubs: Midwest: SEEDCorn: Sustainable Enabling Environment for Data Collaboration (This Proposal)

Source of Support: NSF

Total Award Amount: $1,250,000   Total Award Period Covered: 9/1/2015-8/31/2018

Location of Project: University of Illinois at Urbana-Champaign

Person-Months Per Year Committed to the Project.   Cal: 0   Acad: 0   Sumr: 0

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

NSF Form 1239 (10/99)   USE ADDITIONAL SHEETS AS NECESSARY

Current and Pending Support

(See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

	Other agencies (including NSF) to which this proposal has been/will be submitted.
Investigator: Maxine D. BROWN	

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

IRNC:ProNet: TransLight/StarLight (subaward)

Source of Support: NSF #OCI-0962997

Total Award Amount: $2,038,000   Total Award Period Covered: 7/1/10 - 8/31/15

Location of Project: UCSD, UIC and NU

Person-Months Per Year Committed to the Project.   Cal: 1.0   Acad: Sumr:

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

SI2-SSI: SAGEnext: Next Generation Integrated Persistent Visualization

and Collaboration Services for Global Cyberinfrastructure

Source of Support: NSF #ACI-1441963

Total Award Amount: $5,000,000   Total Award Period Covered: 10/1/13-9/30/18

Location of Project: UIC, UHawaii

Person-Months Per Year Committed to the Project.   Cal: 3.0   Acad: Sumr:

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Development of the Sensor Environment Imaging (SENSEI) Instrument

Source of Support: NSF #CNS-1456638

Total Award Amount: $3,000,000   Total Award Period Covered: 10/1/14-9/30/17

Location of Project: UIC, JSU, SIO, UCSD, UHM

Person-Months Per Year Committed to the Project.   Cal: 1.0   Acad: Sumr:

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

IRNC: RXP: StarLight SDX (StarAX) - An Advanced Software Defined Networki

Exchange for Global Science Research and Education

Source of Support: NSF

Total Award Amount: $3,750,000   Total Award Period Covered: 1/1/2015 -12/31/2019

Location of Project: NU, UCSD, UIC

Person-Months Per Year Committed to the Project.   Cal: 1.0   Acad: Sumr:

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

MRI: Development of the Continuum - a Display and Sensor Rich

Attentive Amplified Collaboration Environment

Source of Support: NSF

Total Award Amount: $1,050,000   Total Award Period Covered: 8/16/15-8/15/18

Location of Project: UIC

Person-Months Per Year Committed to the Project.   Cal: 0.2   Acad: Sumr:

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*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

NSF Form 1239 (10/99)   USE ADDITIONAL SHEETS AS NECESSARY

Current and Pending Support

(See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.	
	Other agencies (including NSF) to which this proposal has been/will be submitted.
Investigator: Maxine D. Brown	

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

BD Hubs: Midwest: SEEDCorn: Sustainable Enabling Environment for Data Collaboration

(this proposal)

Source of Support: NSF

Total Award Amount: $1,250,000   Total Award Period Covered: 9/1/15-8/31/18

Location of Project: UIUC

Person-Months Per Year Committed to the Project.   0.0   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

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*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

NSF Form 1239 (10/99)   USE ADDITIONAL SHEETS AS NECESSARY

Current and Pending Support
(See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator: Fred H. Cate	Other agencies (including NSF) to which this proposal has been/will be submit- n/a

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

BD Hubs: Midwest: "SEEDCorn: Sustainable Enabling Environment for Data Collaboration" < This Proposal

Source of Support: NSF

Total Award Amount: 95,000   Total Award Period Covered: 09/01/15-08/31/18

Location of Project: Multi-site; University of Illinois, Urbana-Champaign, lead

Person-Months Per Year Committed to the Project.   0.00   Cal: Acad: 0.00   Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

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*If this project has previously been funded by another agency, please list and furnish information for immediately pre-
ceding funding period.

NSF Form 1239 (10/99)   USE ADDITIONAL SHEETS AS NECESSARY

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Current and Pending Support
(See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator: **Charles Catlett**	Other agencies (including NSF) to which this proposal has

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: Center for urban Systems and Information Sciences (CUSIS)

Source of Support: MacArthur Foundation

Total Award Amount: $500,000   Total Award Period Covered: 3/1/13 – 8/31/15 (NCE)

Location of Project: University of Chicago

Person-Months Per Year Committed to the	Cal: 0.24	Acad:	Sumr:

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: National Family Self-Sufficiency

Source of Support: NSF-thru Chapin Hall

Total Award Amount: $580,000   Total Award Period Covered: 10/1/2015 – 9/30/2017

Location of Project: University of Chicago

Person-Months Per Year Committed to the	Cal: 1.2	Acad:	Sumr:

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: BCC-SBE: An Urban Sciences Research Coordination Network for Data-Driven Urban Design and Analysis

Source of Support: NSF

Total Award Amount: $592,567   Total Award Period Covered: 10/1/12 – 9/30/15

Location of Project: University of Chicago

Person-Months Per Year Committed to the	Cal: 1.2	Acad:	Sumr:

Support: ☒ Current ☐ ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: Prototyping an Urban Data Cyberinfrastructure for Computation Social Sciences

Source of Support: NSF

Total Award Amount: $299,998   Total Award Period Covered: 10/01/2013 – 09/30/2015

Location of Project: University of Chicago

Person-Months Per Year Committed to the	Cal: 1.2	Acad:	Sumr:

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near ☐ *Transfer of Support

Project/Proposal Title: The Center for Urban Air Vitality

Source of Support: EPA

Total Award Amount: $1,434,829   Total Award Period Covered: 08/14/2015-08/14/2018

Location of Project: University of Chicago

Person-Months Per Year Committed to the	Cal: 2.0	Acad:	Sumr:

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near ☐ *Transfer of Support

Project/Proposal Title: Urban Development: understanding inequalities in cities using big and open data vision

Source of Support: Bristish Council

Total Award Amount: $10.543   Total Award Period Covered: 03/31/2015-03/30/2017

Location of Project: University of Chicago

Person-Months Per Year Committed to the	Cal: 0.0	Acad:	Sumr:

(See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator: **Charles Catlett**	Other agencies (including NSF) to which this proposal has been/will be submitted.

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: Workshop: Societal Impacts, Ethics, and Big-Data-Enabled Social Sciences

Source of Support: NSF

Total Award Amount: $49,696   Total Award Period Covered: 03/1/2015-02/29/2016

Location of Project: University of Chicago

Person-Months Per Year Committed to the		Cal: 0.19	Acad:	Sumr:

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: Prototyping a Scalable and Evolvable Urban Sensing Platform for Smart Cities

Source of Support: NSF EAGER

Total Award Amount: $149,978   Total Award Period Covered: 06/15/2015-05/31/2017

Location of Project: University of Chicago

Person-Months Per Year Committed to the		Cal: 0.20	Acad:	Sumr:

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: MRI: Development of an Urban-Scale Instrument for Interdisciplinary Research (This Proposal)

Source of Support: NSF

Total Award Amount: $ 3,620,560   Total Award Period Covered: 10/01/1015-09/30/2018

Location of Project: The University of Chicago

Person-Months Per Year Committed to the Project.		Cal: 0.10	Acad:	Sumr:

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: The Array of Things Workshop: Developing participatory workshops for app design in urban sensing

Source of Support: Motorola Foundation

Total Award Amount: 40,000   Total Award Period Covered: 6/1/2015 – 12/1/2015

Location of Project: The University of Chicago

Person-Months Per Year Committed to the		Cal: 0	Acad:	Sumr:

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: Urban Center for Computation and Data

Source of Support: MacArthur Foundation

Total Award Amount: $500,000   Total Award Period Covered: 4/1/2015 – 3/31/2017

Location of Project: The University of Chicago

Person-Months Per Year Committed to the		Cal: 0	Acad:	Sumr:

*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

Current and Pending Support
(See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator: **Charles Catlett**

Other agencies (including NSF) to which this proposal has been/will be submitted.

Support: ☐ Current   ☒ Pending   ☐ Submission Planned in Near Future   ☐ *Transfer of Support

Project/Proposal Title:

BD Hubs: Midwest: SEEDCorn: Sustainable Enabling Environment for Data Collaboration

(this proposal)

Source of Support: NSF

Total Award Amount: $1,250,000   Total Award Period Covered: 9/1/15-8/31/18

Location of Project: University of Illinois at Urbana-Champaign

Person-Months Per Year Committed to the Project.   0   Cal: Acad: Sumr:

Support: ☐ Current   ☐ Pending   ☐ Submission Planned in Near Future   ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current   ☐ Pending   ☐ Submission Planned in Near Future   ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current   ☐ Pending   ☐ Submission Planned in Near Future   ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current   ☐ Pending   ☐ Submission Planned in Near Future   ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

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*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

NSF Form 1239 (10/99)   USE ADDITIONAL SHEETS AS NECESSARY

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Current and Pending Support

(See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.	
Investigator: Ratna Babu Chinnam, Ph.D.	Other agencies (including NSF) to which this proposal has been/will be submitted.

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Community-Aware Charging Station Network Design for Electrified Vehicles in Urban Areas: Reducing Congestion, Emissions, Improving Accessibility, and Promoting Walking, Bicycling, and use of Public Transportation

Source of Support: U.S. DoT through Transportation Research Center for Livable Communities (TRCLC)

Total Award Amount: $129,975 Total Award Period Covered: June 1, 2015 – May 31, 2016

Location of Project: Wayne State University

Person-Months Per Year Committed to the Project. 1.5 Cal: Acad: 0.75 Sumr: 0.75

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Near Real-Time Decision Support System (NRT-DSS)

Source of Support: Veterans Administration

Total Award Amount: $156,250 Total Award Period Covered: January 1, 2015 – December 31, 2015

Location of Project: Wayne State University

Person-Months Per Year Committed to the Project. 1.5 Cal: Acad: 0.75 Sumr: 0.75

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Design of Real-time Recommendation Systems for Chained Stores using SPARK

Source of Support: Loven Systems

Total Award Amount: $40,000 Total Award Period Covered: January 1, 2015 – December 31, 2015

Location of Project: Wayne State University

Person-Months Per Year Committed to the Project. 1 Cal: Acad: 1 Sumr: 0

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Dealer Performance Analytics: Investigating the Learning Loop

Source of Support: Urban Science

Total Award Amount: $54,000 Total Award Period Covered: January 1, 2015 – December 31, 2015

Location of Project: Wayne State University

Person-Months Per Year Committed to the Project. 1 Cal: Acad: 1 Sumr:

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Product Assortment Optimization Models

Source of Support: Ford Motor Company

Total Award Amount: $55,000 Total Award Period Covered: January 1, 2015 – December 31, 2015

Location of Project: Wayne State University

Person-Months Per Year Committed to the Project. 1 Cal: Acad: 1 Sumr:

*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support
Project/Proposal Title:
Planning Grant: I/UCRC for Excellence in Logistics and Distribution
Source of Support: National Science Foundation
Total Award Amount: $12,999   Total Award Period Covered: August 1, 2013 – July 31, 2015
Location of Project: Wayne State University
Person-Months Per Year Committed to the Project.   0.15   Cal: Acad: 0.15   Sumr:

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support
Project/Proposal Title:
BD Hubs: Midwest: "SEEDCorn: Sustainable Enabling Environment for Data Collaboration"
(this proposal)
Source of Support: National Science Foundation
Total Award Amount: $1,250,000   Total Award Period Covered: 9/1/15-8/31/18
Location of Project: University of Illinois at Urbana-Champaign
Person-Months Per Year Committed to the Project.   0.0   Cal: Acad: Sumr:

CLARKE, JENNIFER L.

Current Support

ATD Collaborative Research: Statistical Ensembles for the Identification of Bacterial Genomes.
Principal Investigator(s):   Adrian Dobra and Jennifer Clarke (1.2 CM)
Grant #:   NR66853W (DMS-1120404)
Funding Source: NSF/DTRA
Project Period: 08/15/11 - 8/14/15
Total Award: $829,168

Inference After Predictor Selection
Principal Investigator: Bertrand Clarke
Role in Project: co-Principal Investigator (0.8 CM)
Funding Source: NSF/DMS
Project Period: 08/01/13 - 07/31/16
Total Award: $145,000

Promoting Gastrointestinal Health And Reducing Subclinical Inflammation In Obese Individuals Though Intake Of Whole Wheat Products In Comparison With Fruits And Vegetables
Principal Investigator: Devin Rose
Role in Project: Co-Investigator (0.5 CM)
Funding Source: USDA/AFRI
Project Period: 08/01/14 - 07/31/17
Total Award: $250,000

Pending Research

III: Small: Robust and Scalable High Dimensional Statistical Clustering for Inference and Prediction
Principal Investigator: Jennifer Clarke (1 CM), Bertrand Clarke
Funding Source: NSF/CISE
Project Period: 08/01/15 - 07/31/18
Total Award: $499,250

Site-Specific Protein Glycoform Analysis
Principal Investigator: Dodds, Eric
Role in Project: Co-Investigator (0.5 CM)
Funding Source: NIH/NIGMS
Project Period: 010/01/15 - 09/30/19
Total Award: $1,426,369

NRT: DESE: DATA SCIENCE FOR SUSTAINABLE PLANT ECOSYSTEMS.
Principal Investigator: Clarke, Jennifer
Role in Project: PI
Funding Source: NSF/EHR
Project Period: 08/01/15 - 07/31/20
Total Award: 3,000,000

NEBRASKA CENTER FOR INTEGRATED BIOMOLECULAR COMMUNICATION (CIBC)

Principal Investigator (Lead): Takacs, Jim
Role in Project: Principal Investigator, Core C – Data Management and Analysis (2.4 CM)
Funding Source: NIH/NIGMS
Project Period: 12/01/14 – 11/30/19
Total Award: $11,179,688

Understanding how soil microbes interact with environmental conditions and affect GHG flux dynamics in managed pastures

Principal Investigator (Lead): Fernando, Samodha
Role in Project: co-PI (0.5 CM)
Funding Source: NIFA/AFRI
Project Period: 03/01/16 – 02/28/17
Total Award: $749,996

Promoting gastrointestinal health and reducing subclinical inflammation in obese individuals by increasing whole grain intake

Principal Investigator (Lead): Rose, Devin
Role in Project: co-PI (0.5 CM)
Funding Source: NIFA/AFRI
Project Period: 10/01/15 – 09/30/18
Total Award: $499,700

Rapid identification and quantitative source tracking of microbial foodborne pathogens

Principal Investigator (Lead): Wang, Bing
Role in Project: co-PI (0.8 CM)
Funding Source: NIFA/AFRI
Project Period: 01/01/16 – 12/31/19
Total Award: $499,647

Identifying emerging viral zoonotic pathogens in swine using a novel high throughput screening method and identifying phages against zoonotic bacterial pathogens in swine for phage therapy

Principal Investigator (Lead): Fernando, Samodha
Role in Project: co-PI (0.5 CM)
Funding Source: NIFA/AFRI
Project Period: 09/01/15 – 08/31/19
Total Award: $499,877

BD Hubs: Midwest: SEEDCorn: Sustainable Enabling Environment for Data Collaboration (this proposal)

Principal Investigator (Lead): Seidel, Ed
Role in Project: Senior Personnel
Funding Source: NSF
Project Period: 09/01/15-08/31/18
Total Award: $1,250,000

Current and Pending Support
(See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator: Joe Colletti	Other agencies (including NSF) to which this proposal has been/will be submitted.

Support: ☒ Current   ☐ Pending   ☐ Submission Planned in Near Future   ☐ *Transfer of Support

Project/Proposal Title:

Ghana – Feed the Future Agricultural Technology Transfer

Source of Support: International Fertilizer Development Center (USAID funded project)

Total Award Amount: $1.6 mil (Colletti: $371,   Total Award Period Covered: 2013 - 2017

Location of Project:

Person-Months Per Year Committed to the Project.   CO-PI   Cal: Acad: Sumr:

Support: ☐ Current   ☒ Pending   ☐ Submission Planned in Near Future   ☐ *Transfer of Support

Project/Proposal Title:

BD Hubs: Midwest: "SEEDCorn: Sustainable Enabling Environment for Data Collaboration" (This Proposal)

Source of Support: NSF

Total Award Amount: $1,250,000   Total Award Period Covered: 9/1/2015-8/31/2018

Location of Project: University of Illinois at Urbana-Champaign

Person-Months Per Year Committed to the Project.   Cal: 0   Acad: 0   Sumr: 0

Support: ☐ Current   ☐ Pending   ☐ Submission Planned in Near Future   ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current   ☐ Pending   ☐ Submission Planned in Near Future   ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current   ☐ Pending   ☐ Submission Planned in Near Future   ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

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*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

NSF Form 1239 (10/99)   USE ADDITIONAL SHEETS AS NECESSARY

Current and Pending Support
(See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator: Ivo Dinov

Other agencies (including NSF) to which this proposal has been/will be submit-

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: UCLA Library

Source of Support: University of California, Los Angeles

Total Award Amount: $0   Total Award Period Covered: 09/01/13-07/31/16

Location of Project: University of California, Los Angeles

Person-Months Per Year Committed to the Project.   Cal: 0.0   Acad: Sumr:

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: Michigan Nutrition and Obesity Research Center (NORC)

Source of Support: National Institutes of Health

Total Award Amount: $1,160,335   Total Award Period Covered: 07/01/14 – 06/30/15

Location of Project: University of Michigan

Person-Months Per Year Committed to the Project.   Cal: Acad: 0.9   Sumr: 0.3

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: The Udall Center Biostatistics and Data Management Core

Source of Support: National Institutes of Health

Total Award Amount: $ 239,277   Total Award Period Covered: 07/01/14 – 06/30/15

Location of Project: University of Michigan

Person-Months Per Year Committed to the Project.   Cal: Acad: 1.0   Sumr:

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: Big Data for Discovery Science

Source of Support: National Institutes of Health

Total Award Amount: $ 49,956   Total Award Period Covered: 07/01/14 - 06/30/19

Location of Project: University of Michigan

Person-Months Per Year Committed to the Project.   Cal: Acad: 1.13   Sumr:

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: Center for Complexity and Self-management of Chronic Disease (CSCD)

Source of Support: National Institutes for Health

Total Award Amount: $ 294,275   Total Award Period Covered: 09/26/14– 07/31/19

Location of Project: University of Michigan

Person-Months Per Year Committed to the Project.   Cal: Acad: 1.5   Sumr:

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*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

NSF Form 1239 (10/99)   USE ADDITIONAL SHEETS AS NECESSARY

Current and Pending Support
(See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator: Ivo Dinov

Other agencies (including NSF) to which this proposal has been/will be submit-

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: BD Hubs: Midwest: "SEEDCorn: Sustainable Enabling Environment for Data Collaboration" (This Pro-

Source of Support: National Science Foundation

Total Award Amount: $ 95,000   Total Award Period Covered: 09/01/2015 – 08/31/2018

Location of Project: University of Michigan

Person-Months Per Year Committed to the Project.   Cal: 0.0   Acad: Sumr:

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: OPEN: Online Probability Education Network

Source of Support: National Science Foundation

Total Award Amount: $ 600,000   Total Award Period Covered: 10/01/15-09/30/18

Location of Project: University of Michigan

Person-Months Per Year Committed to the Project.   Cal: Acad: 0.9   Sumr: 0.3

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

NSF Form 1239 (10/99)   USE ADDITIONAL SHEETS AS NECESSARY

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Current and Pending Support

Investigator:	Placid Ferreira	Other agencies to which this proposal has been/will be submitted:

Support: ☒ Current	☐ Pending	☐ Submission Planned in Near Future	☐ *Transfer of Support
Project/Proposal Title: Direct Patterning of Metallic Nanostructures for Bio-sensing Substrate				
Production				
Source of Support: NSF				
Total Award Amount: $398,994		Total Award Period Covered:	9/1/12-8/31/15
Location of Project: University of Illinois at Urbana-Champaign				
Person-Months Per Year Committed	Cal: 0.00	Acad: 0.00	Sumr: 0.45

Support: ☒ Current	☐ Pending	☐ Submission Planned in Near Future	☐ *Transfer of Support
Project/Proposal Title: Collaborative Research: Laser-driven Micro-Transfer Printing				
Source of Support: NSF				
Total Award Amount: $200,000		Total Award Period Covered:	6/1/13-5/31/16
Location of Project: University of Illinois at Urbana-Champaign				
Person-Months Per Year Committed	Cal: 0.00	Acad: 0.00	Sumr: 0.15

Support: ☒ Current	☐ Pending	☐ Submission Planned in Near Future	☐ *Transfer of Support
Project/Proposal Title: Development of an Optomechanical Microscope				
Source of Support: Carver Charitable Trust				
Total Award Amount: $300,000		Total Award Period Covered:	5/16/15-5/15/17
Location of Project: University of Illinois at Urbana-Champaign				
Person-Months Per Year Committed	Cal: 0.00	Acad: 0.27	Sumr: 0.00

Support: ☐ Current	☒ Pending	☐ Submission Planned in Near Future	☐ *Transfer of Support
Project/Proposal Title: Integrated Part Variation Management				
Source of Support: Caterpillar, Inc. (DMDII)				
Total Award Amount: $410,868		Total Award Period Covered:	5/1/15-4/30/17
Location of Project: University of Illinois at Urbana-Champaign				
Person-Months Per Year Committed	Cal: 0.00	Acad: 0.90	Sumr: 0.50

Support: ☐ Current	☒ Pending	☐ Submission Planned in Near Future	☐ *Transfer of Support
Project/Proposal Title: SNM: Massively Parallel Stamp-Based Electrochemical Patterning of				
Semiconductors				
Source of Support: Arizona State University (NSF)				
Total Award Amount: $392,925		Total Award Period Covered:	7/1/15-6/30/19
Location of Project: University of Illinois at Urbana-Champaign				
Person-Months Per Year Committed	Cal: 0.25	Acad: 0.00	Sumr: 0.00

Current and Pending Support

Investigator:	Placid Ferreira	Other agencies to which this proposal has been/will be submitted:

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support		
Project/Proposal Title: SNM: Scalable Fabrication & Assembly of Rolled-up Functional Cells for		
Miniaturized Electronic and Energy Products		
Source of Support: NSF		
Total Award Amount: $1,189,888	Total Award Period Covered:	8/1/15-7/31/19
Location of Project: University of Illinois at Urbana-Champaign		
Person-Months Per Year Committed	Cal: 0.60 Acad: 0.00 Sumr: 0.00	

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support		
Project/Proposal Title: Virtually-Guided Certification of Die Cast Manufacturing Processes		
Source of Support: DMDII		
Total Award Amount: $714,844	Total Award Period Covered:	9/16/15-9/15/17
Location of Project: University of Illinois at Urbana-Champaign		
Person-Months Per Year Committed	Cal: 0.50 Acad: 0.90 Sumr: 0.00	

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support		
Project/Proposal Title: OSCM: An Operating System for Cyberphysical Manufacturing		
Source of Support: DMDII		
Total Award Amount: $1,056,409	Total Award Period Covered:	9/21/15-9/20/17
Location of Project: University of Illinois at Urbana-Champaign		
Person-Months Per Year Committed	Cal: 0.50 Acad: 0.54 Sumr: 0.50	

Current and Pending Support
(See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator: Kevin Franklin	Other agencies (including NSF) to which this proposal has been/will be submitted.

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

BD Hubs: Midwest: SEEDCorn: Sustainable Enabling Environment for Data Collaboration (This Proposal)

Source of Support: NSF

Total Award Amount: $1,250,000   Total Award Period Covered: 9/1/2015-8/31/2018

Location of Project: University of Illinois at Urbana-Champaign

Person-Months Per Year Committed to the Project.   Cal: 0   Acad: 0   Sumr: 0

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

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*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

NSF Form 1239 (10/99)   USE ADDITIONAL SHEETS AS NECESSARY

Current and Pending Support

(See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator: Michael Fry	Other agencies (including NSF) to which this proposal has been/will be submitted.

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Agency Profiling Project

Source of Support: Great American Insurance Group

Total Award Amount: $14,000   Total Award Period Covered: 01/01/2015-07/30/2015

Location of Project: University of Cincinnati

Person-Months Per Year Committed to the Project.   Cal: Acad: 0.25   Sumr: 0.25

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Optimizer Supply Chain Network Software

Source of Support: LeanCor, LLC

Total Award Amount: $30,000   Total Award Period Covered: 08/01/2013-08/01/2015

Location of Project: University of Cincinnati

Person-Months Per Year Committed to the Project.   Cal: 0.25   Acad: Sumr:

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

BD Hubs: Midwest: "SEEDCorn: Sustainable Enabling Environment for Data Collaboration"
(this proposal)

Source of Support: NSF

Total Award Amount: $1,250,000   Total Award Period Covered: 9/1/15-8/31/18

Location of Project: University of Cincinnati

Person-Months Per Year Committed to the Project.   Cal: 0.0   Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

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*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

NSF Form 1239 (10/99)   USE ADDITIONAL SHEETS AS NECESSARY

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Current and Pending Support
(See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.	
Investigator: Robert Grossman	Other agencies (including NSF) to which this proposal has been/will be submitted.

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

CC*DNI DIBBS: Interoperating Data Commons and Clouds: Prototyping a National Scale Data Peering Infrastructure

Source of Support: National Science Foundation

Total Award Amount: $4,990,660   Total Award Period Covered: 10/01/15-/09/30/20

Location of Project: Chicago, IL

Person-Months Per Year Committed to the Project.   Cal: 0.50   Acad: Sumr:

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Prototyping high performance computing API to deposit and recover datasets

Source of Support: NIH/Leidos Biomedical Corp./Radiant Creative

Total Award Amount: $147,877   Total Award Period Covered: 05/01/15 – 04/30/16

Location of Project: Chicago, IL

Person-Months Per Year Committed to the Project.   Cal: 0.60   Acad: Sumr:

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Big Machine Science

PI: Rzhetsky

Source of Support: Defense Advanced Research Projects Agency

Total Award Amount: $1,820,661   Total Award Period Covered: 07/15/14 – 01/14/18

Location of Project: Chicago, IL

Person-Months Per Year Committed to the Project.   Cal: 0.12   Acad: Sumr:

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Training of Junior Faculty for Careers in Omics of Lung Diseases

PIs Solway, Grossman, Gozal, Ober, Rzhetsky

Source of Support: NIH/NHLBI

Total Award Amount: $115,000   Total Award Period Covered: 09/01/03 – 05/31/18

Location of Project: Chicago, IL

Person-Months Per Year Committed to the Project.   Cal: 0.12   Acad: Sumr:

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

IBD Genetics Consortium Data Coordinating Center

PI: Cho, Site PI: Thisted

Source of Support: NIH/ Mt. Sinai

Total Award Amount: $151,359   Total Award Period Covered: 05/06/14-08/31/17

Location of Project: Chicago, IL

Person-Months Per Year Committed to the Project.   Cal: 0.60   Acad: Sumr:

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*If this project has previously been funded by another agency, please list and furnish information for immediately pre-ceding funding period.

NSF Form 1239 (10/99)   USE ADDITIONAL SHEETS AS NECESSARY

Current and Pending Support
(See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator: Robert Grossman	Other agencies (including NSF) to which this proposal has been/will be submitted.

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Re-Engineering Translational Research at the University of Chicago

PI Solway

Source of Support: NIH

Total Award Amount: $3,098,116   Total Award Period Covered: 09/17/07-05/31/17

Location of Project: Chicago, IL

Person-Months Per Year Committed to the Project.   Cal: .6   Acad: Sumr:

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Center for Computational Systems Genomics of Neuropsychiatric Phenotypes

PIs: Rzhetsky, Grossman

Source of Support: NIH

Total Award Amount: $173,785   Total Award Period Covered: 07/01/11-07/31/16

Location of Project: Chicago, IL

Person-Months Per Year Committed to the Project.   Cal: 1.00   Acad: Sumr:

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Bionimbus Protected Data Cloud

Source of Support: NIH/Leidos Biomedical Research

Total Award Amount: $113,028   Total Award Period Covered: 12/21/12-06/24/16 (NCE)

Location of Project: Chicago, IL

Person-Months Per Year Committed to the Project.   Cal: 0.00   Acad: Sumr:

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

BigData: Small: DCM: Open Flow Enabled Hadoop over Local and Wide Area Clusters

Source of Support: NSF

Total Award Amount: $503,231   Total Award Period Covered: 06/01/13-05/31/16

Location of Project: Chicago, IL

Person-Months Per Year Committed to the Project.   Cal: 0.75   Acad: Sumr:

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

The Open Genomic Data Commons (OGDC)

Source of Support: NIH/Leidos Biomedical Corporation

Total Award Amount: $15,867,826   Total Award Period Covered: 05/20/14-05/19/16

Location of Project: Chicago, IL

Person-Months Per Year Committed to the Project.   Cal: 4.20   Acad: Sumr:

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*If this project has previously been funded by another agency, please list and furnish information for immediately pre-ceding funding period.

Current and Pending Support
(See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator: Robert Grossman	Other agencies (including NSF) to which this proposal has been/will be submitted.

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

SDCI Net: UD* - A UDT Based Application Suite for High Performance Data Transport

Source of Support: NSF

Total Award Amount: $979,188   Total Award Period Covered: 09/01/11-08/31/15 (NCE)

Location of Project: Chicago, IL

Person-Months Per Year Committed to the Project.   Cal: 1.00   Acad: Sumr:

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

CAPriCORN

PI: Meltzer

Source of Support: PCORI-Patient Centered Outcomes Research Institute

Total Award Amount: $317,827   Total Award Period Covered: 03/1/14-08/31/15

Location of Project: Chicago, IL

Person-Months Per Year Committed to the Project.   Cal: 0.24   Acad: Sumr:

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

PIRE: Training and Workshops in Data Intensive Computing Using the Open Science Data Cloud (OSDC)

Source of Support: NSF

Total Award Amount: $1,652,930   Total Award Period Covered: 12/03/10-07/31/15

Location of Project: Chicago, IL

Person-Months Per Year Committed to the Project.   Cal: 1.55   Acad: Sumr:

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: INFOBLOX-ESL BRASS

PI: Stuart Bailey; Site PI: Grossman

Source of Support: DARPA

Total Award Amount: $495,595   Total Award Period Covered: 10/01/15-09/30/19

Location of Project: Chicago, IL

Person-Months Per Year Committed to the Project.   Cal: 0.60   Acad: Sumr:

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

PRISMS Data and Software Coordination and Integration Center

Source of Support: NIH

Total Award Amount: $5,760,017   Total Award Period Covered: 10/01/15-09/30/19

Location of Project: Chicago, IL

Person-Months Per Year Committed to the Project.   Cal: 0.60   Acad: Sumr:

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*If this project has previously been funded by another agency, please list and furnish information for immediately pre-ceding funding period.

Current and Pending Support
(See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator: Robert Grossman	Other agencies (including NSF) to which this proposal has been/will be submitted.

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Transcriptome-based Drug Repurposing in Cancers

PI: R. Stephanie Huang; Dr. Grossman Co-Investigator

Source of Support: NIH

Total Award Amount: $2,422,623   Total Award Period Covered: 4/1/16-3/21/21

Location of Project: Chicago, IL

Person-Months Per Year Committed to the Project.   Cal: 0.24   Acad: Sumr:

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

BD Hubs: Midwest: SEEDCorn: Sustainable Enabling Environment for Data Collaboration

(this proposal)

Source of Support: NSF

Total Award Amount: $1,250,000   Total Award Period Covered: 9/1/15-8/31/18

Location of Project: University of Illinois at Urbana-Champaign

Person-Months Per Year Committed to the Project.   0   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

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*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

NSF Form 1239 (10/99)   USE ADDITIONAL SHEETS AS NECESSARY

Current and Pending Support
(See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator: Jun Huan	Other agencies (including NSF) to which this proposal has been/will be submitted. N/A

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Collaborative Research: EAGER: Automating HERD Reporting Using Machine Learning and Administrative Data
    Source of Support

Source of Support: National Science Foundation

Total Award Amount: $176,071   Total Award Period Covered: 09/01/2015-8/31/2017

Location of Project: The University of Kansas, Lawrence, Kansas

Person-Months Per Year Committed to the Project.   Co-PI   Cal: Acad: Sumr: .5

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Citizen Science and Computational Tools for Rapid Transition of Water Data to Knowledge to Decision Making

Source of Support: National Science Foundation (Subcontract from University of Missouri)

Total Award Amount: $1,199,939   Total Award Period Covered: 10/01/2015-09/31/2018

Location of Project: The University of Kansas, Lawrence, Kansas

Person-Months Per Year Committed to the Project.   Co-PI   Cal: Acad: Sumr: 1.0

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Establishing a Graduate Training Program Support Data Enabled Analysis and Optimization of the Food-Energy-Water Nexus

Source of Support: National Science Foundation

Total Award Amount: $2,971,440   Total Award Period Covered: 01/01/2016-12/31/2020

Location of Project: University of Kansas, Lawrence, Kansas

Person-Months Per Year Committed to the Project.   PI   Cal: Acad: Sumr: .6

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Integrative *In Silico* Target Deconvolution Approaches from Phenotypic Readouts using "Big Data" Approaches

Source of Support: National Institute of Health

Total Award Amount: $375,000   Total Award Period Covered: 09/01/2015-08/31/2017

Location of Project: The University of Kansas, Lawrence, Kansas

Person-Months Per Year Committed to the Project.   PI   Cal: Acad: Sumr: 2.0

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Technology Links Medical Record Data to Heart Failure Palliative Care Algorithms

Source of Support: National Institute of Health

Total Award Amount: $1,529,663   Total Award Period Covered: 12/15-12/18

Location of Project: The University of Kansas, Lawrence, Kansas

Person-Months Per Year Committed to the Project.   Consult-   Cal: .5   Acad: Sumr:

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*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

NSF Form 1239 (10/99)   USE ADDITIONAL SHEETS AS NECESSARY

Current and Pending Support
(See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator: Jun Huan	Other agencies (including NSF) to which this proposal has been/will be submitted.

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

PIF:BIC Engineering Smart Matching Systems to Drive Positive Outcomes in Child Welfare

Source of Support: National Science Foundation

Total Award Amount: $998,854   Total Award Period Covered: 09/01/2015-08/31/2018

Location of Project: The University of Kansas, Lawrence, Kansas

Person-Months Per Year Committed to the Project.   PI   Cal: Acad: Sumr: 1.5

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

MRI: Acquisition of a Complete Visualization System for Research and Education in Science, Engineering, Journalism, and Special Education

Source of Support: National Science Foundation

Total Award Amount: $1,740,525   Total Award Period Covered: 08/01/2015-07/31/2018

Location of Project: The University of Kansas, Lawrence, Kansas

Person-Months Per Year Committed to the Project.   Co-PI   Cal: Acad: Sumr:

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

(THIS PROPSAL)

BD Hubs: Midwest: SEEDCorn: Sustainable Enabling Environment for Data Collaboration

Source of Support: National Science Foundation

Total Award Amount: $1,250,000   Total Award Period Covered: 9/1/15-8/31/18

Location of Project: University of Illinois at Urbana-Champaign

Person-Months Per Year Committed to the Project.   0.0   Cal: Acad: Sumr:

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Data Collection and Risk Evaluation Learning in Identifying High Risk Ebola Subpopulations for the Intervention and Prevention of Large-scale Ebola Virus Spreading

Source of Support: National Science Foundation

Total Award Amount: $189,000   Total Award Period Covered: 01/01/2015-12/31/2015

Location of Project: The University of Kansas, Lawrence, Kansas

Person-Months Per Year Committed to the Project.   PI   Cal: Acad: Sumr: .5

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

SBE TWC: Small: Collaborative Research: Privacy Protection in Social Networks: Bridging the Gap Between User Perception and Privacy Enforcement

Source of Support: National Science Foundation

Total Award Amount: $220,162   Total Award Period Covered: 08/01/2014-07/31/2017

Location of Project: The University of Kansas, Lawrence, Kansas

Person-Months Per Year Committed to the Project.   Co-PI   Cal: Acad: Sumr: .5

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*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

NSF Form 1239 (10/99)   USE ADDITIONAL SHEETS AS NECESSARY

Current and Pending Support
(See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.	
Investigator: Jun Huan	Other agencies (including NSF) to which this proposal has been/will be submitted.

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

MRI: Acquisition of Computing Equipment for Support Data-intensive Bioinformatics Research at the University of Kansas

Source of Support: National Science Foundation

Total Award Amount: $500,000   Total Award Period Covered: 08/01/2013-07/31/2016

Location of Project: The University of Kansas, Lawrence, Kansas

Person-Months Per Year Committed to the Project.   PI   Cal: Acad: Sumr: .03

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

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*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

NSF Form 1239 (10/99)   USE ADDITIONAL SHEETS AS NECESSARY

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Current and Pending Support
(See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator: Yinlun Huang	Other agencies (including NSF) to which this proposal has been/will be submitted. N/A

Support: X Current   ☐ Pending   ☐ Submission Planned in Near Future   ☐ *Transfer of Support

Project/Proposal Title: RCN-SEES: Sustainable Manufacturing Advances in Research and Technology (SMART) Coordination Network (PI, with T. Edgar – UT Austin, M. El-Halwagi - TAMU, C. Davidson – Syracuse U, M. Eden – Auburn U as Co-PIs)

Source of Support: NSF

Total Award Amount: $ 721,800   Total Award Period Covered: 01/12 -- 12/16

Location of Project: CACHE and Wayne State University

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr: 1.0

Support: X Current   ☐ Pending   ☐ Submission Planned in Near Future   ☐ *Transfer of Support

Project/Proposal Title: EAGER: Work Integration through Work Exchange Network Synthesis (PI)

Source of Support: NSF

Total Award Amount: $ 60,000   Total Award Period Covered: 08/14 – 07/16

Location of Project: Wayne State University

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr: 0

Support: X Current   ☐ Pending   ☐ Submission Planned in Near Future   ☐ *Transfer of Support

Project/Proposal Title: EAGER: Fundamental Study on Hierarchical Control of Sustainable Development of Complex Industrial Systems under Uncertainty (PI)

Source of Support: NSF

Total Award Amount: $ 192,995   Total Award Period Covered: 08/14 – 07/16

Location of Project: Wayne State University

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr: 1.0

Support: X Current   Pending   ☐ Submission Planned in Near Future   ☐ *Transfer of Support

Project/Proposal Title: U.S. NSF – China NSF Workshop on Sustainable Manufacturing, Wuhan, China March 13-15, 2014 (PI)

Source of Support: NSF

Total Award Amount: $ 50,000   Total Award Period Covered: 02/14 – 08/15

Location of Project: Wayne State University

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr: 0.6

Support: Current   X Pending   ☐ Submission Planned in Near Future   ☐ *Transfer of Support

Project/Proposal Title: Collaborative Research: Sustainability Education for Chemical Engineers (SEChE): Systematic Integration of Sustainability into the Undergraduate Core Curriculum (PI: Y. Huang, with others from U Texas, Mich. Tech., U. Kentucky, Tuskegee U., and AIChE)

Source of Support: NSF

Total Award Amount: $ 3,000,000   Total Award Period Covered: 09/15 -- 08/20

Location of Project: Wayne State University

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr: 1.5

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*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

NSF Form 1239 (10/98)   USE ADDITIONAL SHEETS AS NECESSARY

CURRENT AND PENDING SUPPORT

Investigator: H.V. Jagadish

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Support:	Current
Project/Proposal Title:	IGERT Full Proposal Open Data: Graduate Training for Data Sharing and Reuse in E-Science
Source of Support:	National Science Foundation
Total Award Amount:	$1,061,583
Total Award Period Covered:	08/01/2009-12/31/2015
Location of Project:	The University of Michigan

Person-Months Per Year Committed to the Project: Cal.:   Acad: Sumr: .

Support:	Current (co-PI)
Project/Proposal Title:	Integrated Systems Biology Approach to Diabetic Microvascular Complications
Source of Support:	National Institutes of Health
Total Award Amount:	$5,392,976
Total Award Period Covered:	04/01/2010 – 03/31/2016
Location of Project:	The University of Michigan

Person-Months Per Year Committed to the Project: Cal.:   Acad: Sumr:

Support:	Current
Project/Proposal Title:	III: Small: Usable Database through Organic Technology
Source of Support:	National Science Foundation
Total Award Amount:	$498,521
Total Award Period Covered:	09/01/2010-08/31/2015
Location of Project:	The University of Michigan

Person-Months Per Year Committed to the Project: Cal.:   Acad: Sumr: .25

Support:	Current (co-PI)
Project/Proposal Title:	Metabolic Reprogramming in Diabetic Complications
Source of Support:	National Institutes of Health
Total Award Amount:	$108,811
Total Award Period Covered:	9/30/2011 - 6/30/2016
Location of Project:	The University of Michigan

Person-Months Per Year Committed to the Project: Cal.:   Acad: Sumr:

Support:	Current (co-PI)
Project/Proposal Title:	Software Center for Predictive Theory and Modeling
Source of Support:	Department of Energy
Total Award Amount:	$11,000,000
Total Award Period Covered:	9/1/2012 - 8/31/2017
Location of Project:	The University of Michigan

Person-Months Per Year Committed to the Project: Cal.:   Acad: Sumr: 1

Support:	Current
Project/Proposal Title:	BIGDATA: Small: DA: Choosing a Needle in a Big Data Haystack
Source of Support:	National Science Foundation
Total Award Amount:	$674,765
Total Award Period Covered:	03/15/2013 – 2/29/2016
Location of Project:	The University of Michigan

Person-Months Per Year Committed to the Project: Cal.:   Acad: Sumr: 1

Investigator: H.V. Jagadish

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Support:	Current
Project/Proposal Title:	TC: Small: Collaborative Research: User-Centric Privacy Control for Collaborative Social Media
Source of Support:	National Science Foundation
Total Award Amount:	$226,654
Total Award Period Covered:	09/01/2010 – 08/31/2015
Location of Project:	The University of Michigan
Person-Months Per Year Committed to the Project:	Cal.: Acad: Sumr:

Support:	Current
Project/Proposal Title:	Aligning Data Across Incompatible Geographical Units
Source of Support:	Bill and Melinda Gates Foundation
Total Award Amount:	$100,000
Total Award Period Covered:	11/1/2013 - 10/31/2015
Location of Project:	The University of Michigan
Person-Months Per Year Committed to the Project:	Cal.: Acad: Sumr:

Support:	Pending (co-PI)
Project/Proposal Title:	Training the Next Generation of Quantitative Scientists for Big Data
Source of Support:	National Institute of Health
Total Award Amount:	$2,187,978
Total Award Period Covered:	9/1/2015 – 8/31/2020
Location of Project:	The University of Michigan
Person-Months Per Year Committed to the Project:	Cal.: Acad: Sumr:

Support:	Pending
Project/Proposal Title:	BIGDATA: F: Segmented Aggregate Discovery from Social Media and Online Databases
Source of Support:	National Science Foundation
Total Award Amount:	$896,536
Total Award Period Covered:	01/01/2016 – 12/31/2018
Location of Project:	The University of Michigan
Person-Months Per Year Committed to the Project:	Cal.: Acad: Sumr: 1.00

Support:	Pending-This proposal
Project/Proposal Title:	BD Hubs: Midwest: "SEEDCorn: Sustainable Enabling Environment for Data Collaboration" (This Proposal)
Source of Support:	National Science Foundation
Total Award Amount:	$95,000
Total Award Period Covered:	09/01/2015-08/31/18
Location of Project:	The University of Michigan
Person-Months Per Year Committed to the Project:	Cal.: Acad: Sumr:

Diego Klabjan

Current and Pending Support

Current

Title: Data Analytics and Maxeler's Technology
Sponsor: CME Group Foundation
Project Dates: 09/01/2013 – 08/31/2015
Effort: 0.20 SUM
Awarded Budget: $10,000

Title: GOALI Portfolio of Renewable Energy Generation
Sponsor: National Science Foundation
Project Dates: 04/15/2012 – 03/30/2016
Effort: 1.00 SUM
Awarded Budget: $300,000

Title: Parallel Computing in Financial Engineering (PI: Linetsky)
Sponsor: Intel Corporation
Project Dates: 01/01/2015-12/31/2015
Effort: 0.00
Awarded Budget: $200,000

Title: Knowledge Management via Document Classification and Ranking in Complex Technical Eco-System
Sponsor: Semiconductor Research Corporation
Project Dates: 06/01/2014 – 05/30/2017
Effort: 1.00 SUM
Awarded Budget: $288,900

Title: Machine Learning Algorithms to Reduce Errors in Clinical Workflow (PI: Siddhartha)
Sponsor: Baxter Healthcare Corporation
Project Dates: 06/01/2015-5/31/2016
Effort: 0.09 ACAD
Awarded Budget: $127,249

Title: NRT: Training in Data-Driven Discovery -- From the Earth and the Universe to the Successful Careers of the Future (PI: Kalogera)
Sponsor: NSF
Project Dates: 04/01/2015-03/31/2020
Effort: 0.25 SUM
Awarded Budget: $2,966,598

Pending

Title: OSCM: An Operating System for Cyberphysical Manufacturing (PI: Cao)
Sponsor: University of Illinois Urbana-Champaign//UI Labs// DoD

Project Dates: 09/01/2015-08/31/2017
Effort: 1.36 ACAD//0.55 SUM
Awarded Budget: $400,000

Title: BD Hubs: Midwest: "SEEDCorn: Sustainable Enabling Environment for Data Collaboration" (this proposal)
Sponsor: NSF
Project Dates: 9/1/15-8/31/18
Effort: 0.00
Proposed Budget: $1,250,000

Current and Pending Support
(See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator: Wolfgang Kliemann	Other agencies (including NSF) to which this proposal has been/will be submitted. None

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

BD Hubs: Midwest: "SEEDCorn: Sustainable Enabling Environment for Data Collaboration"

Source of Support: NSF

Total Award Amount: $1,250,000   Total Award Period Covered: 9/1/15-8/31/18

Location of Project: University of Illinois at Urbana-Champaign

Person-Months Per Year Committed to the Project.   0   Cal: 0   Acad: 0   Sumr: 0

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Effects of Community Assets on Rural Business Development

Source of Support: USDA

Total Award Amount: $689,879   Total Award Period Covered: 9/28/10-9/30/15

Location of Project: Iowa State University

Person-Months Per Year Committed to the Project.   0   Cal: 0   Acad: 0   Sumr: 0

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

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*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

Current and Pending Support
(See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator: Jun Li	Other agencies (including NSF) to which this proposal has been/will be submitted.

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: BD Hubs: Midwest: "SEEDCorn: Sustainable Enabling Environment for Data Collaboration (This Proposal)

Source of Support: NSF

Total Award Amount: $95,000   Total Award Period Covered: 09/01/2015 – 08/31/2018

Location of Project: University of Michigan

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr: 0.0

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: EAGER "Gaining Visibility into Supply Network Risks with Large-scale Textual Analysis"

Source of Support: NSF

Total Award Amount: $177,030   Total Award Period Covered: 07/01/2015 – 06/30/2017

Location of Project: University of Michigan

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr: 0.25

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

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*If this project has previously been funded by another agency, please list and furnish information for immediately pre-ceding funding period.

NSF Form 1239 (10/99)   USE ADDITIONAL SHEETS AS NECESSARY

Current and Pending Support

(See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator: Bertram Ludäscher

Other agencies (including NSF) to which this proposal has been/will be submitted
None

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: Filtered Push: Continuous Quality Control for Distributed Collections and Other Species-Occurrence Data
Source of Support: NSF
PI: Macklin, James
Total Award Amount: UCD subk **$414,822**   **Total Award Period Covered**: 07/01/10-07/31/2015
Location of Project: Harvard (lead) and UC Davis (subcontract)
Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr: 0.5

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: IIS-Small: A Logic-Based, Provenance-Aware System for Merging Scientific Data under Context and Classification Constraints
PI: Ludaescher Bertram
Source of Support: NSF IIS
Total Award Amount: $479,194   **Total Award Period Covered**: 10/1/2011 – 9/30/2015
Location of Project: UC Davis
Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr: 0.5

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: BCSP:Collaborative Research: ABI Development: Exploring Taxon Concepts (ETC) through Analyzing Fine-Grained Semantic Markup of Descriptive Literature
PI: (for UC Davis) Ludaescher Bertram
Source of Support: NSF ABI
Total Award Amount: $392,114   **Total Award Period Covered**: 09/01/12--08/30/16
Location of Project: UC Davis (lead PI of the collaboration: Hong Cui at University of Arizona)
Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr: 0.5

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: Collaborative Research: ABI Development: Kurator: A Provenance-enabled Workflow Platform and Toolkit to Curate Biodiversity Data
PI: Ludaescher Bertram
Source of Support: NSF
Total Award Amount: $748,933   **Total Award Period Covered**: 09/01/2014–8/31/2017
Location of Project: UC Davis & Harvard University
Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr: 1

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: BCC: Collaborative Research: Designing SKOPE: Synthesized Knowledge of Past Environments
PI: Ludaescher Bertram
Source of Support: NSF
Total Award Amount: UC Davis**: $133,877** (collaborative total: $393,089)   **Total Award Period Covered**: 09/01/2014 - 02/28/2016
Location of Project: UC Davis, Arizona State University, Washington State University
Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr: 0.5

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: Collaborative Research: ABI Development: An Integrated, Scalable Service for Resolving Taxonomic Concept Provenance
PI: Ludaescher Bertram
Source of Support: NSF
Total Award Amount: UIUC **$255,914** (U of A: $470,855)   **Total Award Period Covered**: 03/01/15 - 02/28/18
Location of Project: U of Illinois at Urbana-Champaign (collaborator: University of Arizona),
Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr: 0.5

Support: ☐ Current   ☒ Pending   ☐ Submission Planned in Near Future   ☐ *Transfer of Support

Project/Proposal Title: CC*DNI DIBBS: Merging Science and Cyberinfrastructure Pathways: The Whole Tale
PI: Ludaescher Bertram
Source of Support: NSF
Total Award Amount: $4,986,951   **Total Award Period Covered**: 1/1/2016 – 12/31/2020
Location of Project: U of Illinois at Urbana-Champaign
Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr: 1

Support: ☐ Current   ☒ Pending   ☐ Submission Planned in Near Future   ☐ *Transfer of Support

Project/Proposal Title: BD Hubs: Midwest: "SEEDCorn: Sustainable Enabling Environment for Data Collaboration" (This Proposal)
PI: Ed Seidel
Source of Support: NSF
Total Award Amount: $1,250,000   **Total Award Period Covered** 9/1/2015-8/31/2018
Location of Project: University of Illinois at Urbana-Champaign
Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

NSF Form 1239   Use additional sheets as necessary

Current and Pending Support

(See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator: **Sanjay Madria**	Other agencies (including NSF) to which this proposal has been/will

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: Risk Assessment Techniques for Off-line and On-line Security Evaluation of Cloud Computing

Source of Support: NSF

Total Award Amount: $126000 (100%)   Total Award Period Covered: 2013-2016

Location of Project: University of Missouri-Rolla (starting Jan 1st, Missouri University of Science and Technology)

Person-Months Per Year Committed to the   Cal: Acad: Sumr: 1

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: REU Site: Research and Training Experience for Undergraduates in the area of Secure Cloud Computing (PI)

Source of Support: NSF

Total Award Amount: $ 360K(60%)   Total Award Period Covered: 4/2015-3/2018

Location of Project: Missouri University of Science and Technology

Person-Months Per Year Committed to the   Cal: Acad: Sumr: 0.65

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: BDD: ESCAP: Efficient and Scalable Collection, Analytics and Processing of Big Data for Disaster Applications

Source of Support: NSF

Total Award Amount: $ 316,000 (100%)   Total Award Period Covered: 4/2015-12/2018

Location of Project: Missouri University of Science and Technology

Person-Months Per Year Committed to the   Cal: Acad: Sumr: 1.0

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: AFRL MIPR – NSF I/UCRC for "Network-Centric Software and Systems (PI)

Source of Support: NSF/AFRL/UNT

Total Award Amount: $ 93000 (100%)   Total Award Period Covered: 09/01/2012-08/2016

Location of Project: Missouri University of Science and Technology

Person-Months Per Year Committed to the   Cal: Acad: Sumr: 1

*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

NSF Form 1239 (10/99)   USE ADDITIONAL SHEETS AS NECESSARY

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Current and Pending Support

(See GPG Section II.D.8 for guidance on information to include on this form.)

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The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator: **Sanjay Madria**	Other agencies (including NSF) to which this proposal has been/will

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: Security and Privacy in Mobile Social Network Space (PI)

Source of Support: DOE

Total Award Amount: $533000 (36%)   Total Award Period Covered: 2012-2016

Location of Project: University of Missouri-Rolla (starting Jan 1st, Missouri University of Science and Technology)

Person-Months Per Year Committed to the   Cal: Acad: Sumr: 0

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: Information Fusion Approach for Securing a Networked Controlled System

Source of Support: UMRB

Total Award Amount: $ 33325 (100%)   Total Award Period Covered: 8/2013-8/2015

Location of Project: Missouri University of Science and Technology

Person-Months Per Year Committed to the   Cal: Acad: Sumr: 0.5

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: Title: Secure Sensor Cloud Computing (PI)

Source of Support: NIST

Total Award Amount: 175K (100%)   Total Award Period Covered: 07/01/2012-06/30/2016

Location of Project: Missouri University of Science and Technology

Person-Months Per Year Committed to the   Cal: Acad: Sumr: 1.0

*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: NSF I/UCRC on Net-Centric Systems Software

Source of Support: NSF

Total Award Amount: 316K (70%)   Total Award Period Covered: 08/25/2012-07/31/2017

Location of Project: Missouri University of Science and Technology

Person-Months Per Year Committed to the   Cal: Acad: Sumr: 1.0

*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: *COLLABORATIVE RESEARCH: NRT DESE: ARTISTIC: Advanced Research and Training in Interdependent Socio-critical Infrastructure Connectivity*

Source of Support: NSF

Total Award Amount: $3M   Total Award Period Covered: 09/01/2015-08/31/2020

Location of Project: Missouri University of Science and Technology

Person-Months Per Year Committed to the   Cal: Acad: Sumr: 0

*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

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Current and Pending Support
(See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

	Other agencies (including NSF) to which this proposal has been/will be submitted.
Investigator: **Sanjay Madria**	

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

BD Hubs: Midwest: SEEDCorn: Sustainable Enabling Environment for Data Collaboration

(this proposal)

Source of Support: NSF

Total Award Amount: $1,250,000   Total Award Period Covered: 9/1/15-8/31/18

Location of Project: University of Illinois at Urbana-Champaign

Person-Months Per Year Committed to the Project.   0.0   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

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*If this project has previously been funded by another agency, please list and furnish information for immediately pre-ceding funding period.

Current and Pending Support
(See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator: Robert H. McDonald

Other agencies (including NSF) to which this proposal has been/will be submit-

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

BD Hubs: Midwest: "SEEDCorn; Sustainable Enabling Environment for Data Collaboration" **< This Proposal**

Source of Support: National Science Foundation

Total Award Amount: $95,000   Total Award Period Covered: 01/01/2016-12/31/2018

Location of Project: Multi-site, University of Illinois, Urbana-Champaign,lead

Person-Months Per Year Committed to the Project.   .00   Cal: .00   Acad: Sumr:

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Exploring the Billions and Billions of Words in the HathiTrust Corpus with Bookworm: HathiTrust + Bookworm Project
HK-50176-14
Co-PI

Source of Support: National Endowment for the Humanities

Total Award Amount: $ 324,841   Total Award Period Covered: 09/01/2014-08/31/2016

Location of Project: Indiana University (received through University of Illinois, Urbana-Champaign)

Person-Months Per Year Committed to the Project.   .34   Cal: .34   Acad: Sumr:

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

DataNet Full Proposal: Sustainable Environment-Actionable Data (SEAD): #0940824
Sr. Personnel

Source of Support: National Science Foundation

Total Award Amount: $ 6,074,920   Total Award Period Covered: 10/01/2011-09/30/2016

Location of Project: Indiana University (received through University of Michigan)

Person-Months Per Year Committed to the Project.   1.25   Cal: 1.25   Acad: Sumr:

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

HathiTrust Research Center
Co-PI

Source of Support: HathiTrust Digital Library/Indiana University/University of Illinois

Total Award Amount: $ 999,524   Total Award Period Covered: 2014-2018

Location of Project: Indiana University/University of Illinois

Person-Months Per Year Committed to the Project.   2.5   Cal: 2.5   Acad: Sumr:

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Kuali Open Library Environment
Co-PI

Source of Support: Andrew W. Mellon Foundation

Total Award Amount: $ 900,000   Total Award Period Covered: 01/01/2016-12/31/2016

Location of Project: Indiana University (received through University of Illinois, Urbana-Champaign

Person-Months Per Year Committed to the Project.   .34   Cal: .34   Acad: Sumr:

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*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

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Current and Pending Support
(See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator: Eric M. Meslin	Other agencies (including NSF) to which this proposal has been/will be submitted. n/a

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Indiana Clinical Translational Science Institute (CTSI)

Source of Support: NIH UL1 RR025761(Shekhar)

Total Award Amount: $3,345,339   Total Award Period Covered: 07/01/08-06/30/18

Location of Project: Indiana University

Person-Months Per Year Committed to the Project.   2.4   Cal: 2.4   Acad: Sumr:

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Indiana University-Moi University Academic Research Ethics Partnership

Source of Support: NIH/Fogarty R25 TW006070

Total Award Amount: $1,650,000   Total Award Period Covered: 06/01/12-05/31/17

Location of Project: Indiana University and Moi University

Person-Months Per Year Committed to the Project.   2.4   Cal: 2.4   Acad: Sumr:

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

BD Hubs: Midwest: "SEEDCorn: Sustainable Enabling Environment for Data Collaboration" < This Proposal

Source of Support: NSF

Total Award Amount: $95,000   Total Award Period Covered: 09/01/15-08/31/18

Location of Project: Multi-site; University of Illinois, Urbana-Champaign, lead

Person-Months Per Year Committed to the Project.   0.0   Cal: 0.0   Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

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*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

Current and Pending Support
(See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator: Gregory Monaco

Other agencies (including NSF) to which this proposal has been/will be submitted.

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

The Role of Regional Organizations in Improving Access to the National Computational Infrastructure

Source of Support: National Science Foundation

Total Award Amount: $63,448   Total Award Period Covered: 6/1/2015-5/31/2016

Location of Project: KSU

| Person-Months Per Year Committed to the Project. | Cal: 0 | Acad: 0 | Sumr: 0 |

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

CC*IIE Region: Leveraging Partnerships Across the Great Plains to Enhance Campus Advanced Networking and CI Expertise

Source of Support: National Science Foundation

Total Award Amount: $129,880   Total Award Period Covered: 9/1/2014-8/31/2016

Location of Project: KSU

| Person-Months Per Year Committed to the Project. | Cal: 0 | Acad: 0 | Sumr: 0 |

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Funding for Executive Director – Great Plains Network

Source of Support: Great Plains Network Consortium

Total Award Amount: $477,642   Total Award Period Covered: 7/1/2013-6/30/2015

Location of Project: KSU

| Person-Months Per Year Committed to the Project. | Cal: 12 | Acad: | Sumr: |

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

BD Hubs: Midwest: SEEDCorn: Sustainable Enabling Environment for Data Collaboration (This Proposal)

Source of Support: NSF

Total Award Amount: $1,250,000   Total Award Period Covered: 9/1/2015-8/31/2018

Location of Project: University of Illinoisat Urbana-Champaign

| Person-Months Per Year Committed to the Project. | Cal: | Acad: | Sumr: |

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

| Person-Months Per Year Committed to the Project. | Cal: | Acad: | Sumr: |

*If this project has previously been funded by another agency, please list and furnish information for immediately pre-ceding funding period.

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Current and Pending Support

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

	Other agencies to which this proposal has been/will be submitted.
Investigator: Nahrstedt, Klara Pg 1 of 3	None

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

NeTSE: Large: Collaborative Research: Exploiting Multi-Modality for Tele-Immersion

Source of Support: National Science Foundation

Total Award Amount: $ 366,400   Total Award Period Covered: 10/1/2010 - 9/30/2015

Location of Project: University of Illinois at Urbana-Champaign

Person-Months Per Year Committed to the Project.   Cal: 0.00   Acad: 0.00   Sumr: 0.33

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

BD Hubs: Midwest: SEEDCorn: Sustainable Enabling Environment for Data Collaboration
(this proposal)

Source of Support: National Science Foundation

Total Award Amount: $ 1,250,000   Total Award Period Covered: 9/1/15-8/31/18

Location of Project: University of Illinois at Urbana-Champaign

Person-Months Per Year Committed to the Project.   Cal: 0.00   Acad: 0.00   Sumr: 0.00

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

EAGER: Enabling In-Network Crowd-Sourcing
(Prof. Nahrsted is co-PI)(PI is Robin Kravets)

Source of Support: National Science Foundation

Total Award Amount: $ 100,000   Total Award Period Covered: 10/1/2013 - 9/30/2015

Location of Project: University of Illinois at Urbana-Champaign

Person-Months Per Year Committed to the Project.   Cal: 0.00   Acad: 0.00   Sumr: 0.0

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

MRI: Development of a Novel Computing Instrument for Big Data in Genomics
(Prof. Nahrstedt is Sr. Personnel) (PI is Steven Lumetta)

Source of Support: Nattional Science Foundation

Total Award Amount: $ 1,800,000   Total Award Period Covered: 9/15/13-9/14/17

Location of Project: University of Illinois at Urbana-Champaign

Person-Months Per Year Committed to the Project.   Cal: 0.00   Acad: 0.00   Sumr: 0.00

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

TWC: Frontier: Collaborative: Enabling Trustworthy Cybersystems for Health and Wellness
(Prof. Nahrstedt is co-PI) (PI is Carl Gunter)

Source of Support: National Science Foundation

Total Award Amount: $ 2,000,000   Total Award Period Covered: 9/1/2013 - 8/31/2018

Location of Project: University of Illinois at Urbana-Champaign

Person-Months Per Year Committed to the Project.   Cal: 0.00   Acad: 0.00   Sumr: 0.50

*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

Current and Pending Support

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator: Nahrstedt, Klara Pg 2 of 3	Other agencies to which this proposal has been/will be submitted. None

Support: ☒ Current   ☐ Pending   ☐ Submission Planned in Near Future   ☐ *Transfer of Support

Project/Proposal Title:

Secure Policy Based Configuration Framework

Source of Support: DOE

Total Award Amount: $ 930,000   Total Award Period Covered: 10/1/2013 - 9/30/2016

Location of Project: University of Illinois at Urbana-Champaign

Person-Months Per Year Committed to the Project.   Cal: 0.00   Acad: 0.00   Sumr: 0.25

Support: ☒ Current   ☐ Pending   ☐ Submission Planned in Near Future   ☐ *Transfer of Support

Project/Proposal Title:

Applied Resiliency for More Trustworthy Grid Operation (ARMORE)

Source of Support: DOE

Total Award Amount: $ 975,000   Total Award Period Covered: 11/1/2013 - 9/30/2016

Location of Project: University of Illinois at Urbana-Champaign

Person-Months Per Year Committed to the Project.   Cal: 0.00   Acad: 0.00   Sumr: 0.25

Support: ☐ Current   ☒ Pending   ☐ Submission Planned in Near Future   ☐ *Transfer of Support

Project/Proposal Title:

 CC*DNI Integration: Software-Defined Dynamic Provisioning of Scientific Laboratories and their Data Networks

Source of Support: NSF

Total Award Amount: $ 1,000,000   Total Award Period Covered: 10/1/15-9/30/17

Location of Project: University of Illinois at Urbana-Champaign

Person-Months Per Year Committed to the Project.   Cal: 0.50   Acad: 0.00   Sumr: 0.00

Support: ☒ Current   ☐ Pending   ☐ Submission Planned in Near Future   ☐ *Transfer of Support

Project/Proposal Title:

 CIF21 DIBBS: T2-C2: Timely and Trusted Curator and Coordinator Data Building Blocks

Source of Support: NSF

Total Award Amount: $ 1,500,000   Total Award Period Covered: 10/1/14-9/30/17

Location of Project: University of Illinois at Urbana-Champaign

Person-Months Per Year Committed to the Project.   Cal: 0.00   Acad: 0.00   Sumr: 0.30

Support: ☐ Current   ☒ Pending   ☐ Submission Planned in Near Future   ☐ *Transfer of Support

Project/Proposal Title:

CPS: Synergy:Real-Time Trustworthy Power-Line System Inspection using UAVs

Source of Support: NSF

Total Award Amount: $ 1,000,000   Total Award Period Covered: 11/1/15-10/31/18

Location of Project: University of Illinois at Urbana-Champaign

Person-Months Per Year Committed to the Project.   Cal: 0.75   Acad: 0.00   Sumr: 0.00

*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

Current and Pending Support

	Other agencies to which this proposal has been/will be submitted.
Investigator: Nahrstedt, Klara Pg 3 of 3	None

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

TWC: Small: Mirage: Privacy-Preserved Proximity Framework for Adaptive Real-time Security in Vehicular Networks

Source of Support: NSF

Total Award Amount: $ 500,000   Total Award Period Covered: 8/15/15-8/14/18

Location of Project: University of Illinois at Urbana-Champaign

Person-Months Per Year Committed to the Project.   Cal: 0.00   Acad: 0.00   Sumr: 0.50

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

CPS: Synergy: Multi-scale Cyber-Physical Control for Urban Flooding Mitigation

Source of Support: NSF

Total Award Amount: $ 1,000,000   Total Award Period Covered: 11/1/15-10/31/18

Location of Project: University of Illinois at Urbana-Champaign

Person-Months Per Year Committed to the Project.   Cal: 0.50   Acad: 0.00   Sumr: 0.00

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project: University of Illinois at Urbana-Champaign

Person-Months Per Year Committed to the Project.   Cal: 0.00   Acad: 0.00   Sumr: 0.00

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project: University of Illinois at Urbana-Champaign

Person-Months Per Year Committed to the Project.   Cal: 0.00   Acad: 0.00   Sumr: 0.00

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project: University of Illinois at Urbana-Champaign

Person-Months Per Year Committed to the Project.   Cal: 0.00   Acad: 0.00   Sumr: 0.00

*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

Current and Pending Support

Current and Pending Support
(See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator: Caralynn Nowinski

Other agencies (including NSF) to which this proposal has been/will be submitted.

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

BD Hubs: Midwest: SEEDCorn: Sustainable Enabling Environment for Data Collaboration (This Proposal)

Source of Support: NSF

Total Award Amount: $1,250,000   Total Award Period Covered: 9/1/2015-8/31/2018

Location of Project: University of Illinois at Urbana-Champaign

Person-Months Per Year Committed to the Project.   Cal: 0   Acad: 0   Sumr: 0

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

*If this project has previously been funded by another agency, please list and furnish information for immediately pre-ceding funding period.

Current and Pending Support
(See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator: Valentin Pentchev	Other agencies (including NSF) to which this proposal has been/will be submit- n/a

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

BD Hubs: Midwest: "SEEDCorn: Sustainable Enabling Environment for Data Collaboration" **< This Proposal**

Source of Support: NSF

Total Award Amount: $95,000   Total Award Period Covered:

Location of Project: Multi-site; University of Illinois, Urbana-Champaign, lead

Person-Months Per Year Committed to the Project.   1.0   Cal: 1.0   Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered: 09/01/15-08/31/18

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

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*If this project has previously been funded by another agency, please list and furnish information for immediately pre-ceding funding period.

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Current and Pending Support
(See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.	
Investigator: Bernice A. Pescosolido	Other agencies (including NSF) to which this proposal has been/will be submit- n/a

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Modeling the Social Environmental Influences and Mechanisms of Suicide

Source of Support: NIH 1R01MH099436-01 (Pescosolido)

Total Award Amount: $1,868,291   Total Award Period Covered: 09/01/12-06/30/16

Location of Project: Indiana University

Person-Months Per Year Committed to the Project.	5.0	Cal:	Acad: 2.25	Sumr: 2.75

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Operating Funds for the Indiana Consortium for Mental Health Services Research

Source of Support: Indiana University-Dean, College of Arts & Sciences

Total Award Amount: $175,000/yr   Total Award Period Covered: 01/01/94-06/30/19

Location of Project: Indiana University

Person-Months Per Year Committed to the Project.	n/a	Cal:	Acad:	Sumr:

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

BD Hubs: Midwest: "SEEDCorn: Sustainable Enabling Environment for Data Collaboration" < This Proposal

Source of Support: NSF

Total Award Amount: $ 95,000   Total Award Period Covered: 09/01/15-08/31/18

Location of Project: Multi-site; University of Illinois, Urbana-Champaign, lead

Person-Months Per Year Committed to the Project.	0.00	Cal: 0.00	Acad:	Sumr:

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Indiana University Network Institute

(Infrastructural and Research Funds)

Source of Support: Indiana University-Offices of the President, Provost & VP for Research

Total Award Amount: $7,000,000   Total Award Period Covered: 01/01/15-12/31/17

Location of Project: Indiana University

Person-Months Per Year Committed to the Project.	2.35	Cal: 1.35	Acad:	Sumr: 1.0

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

INSIEME: Indiana Network Science Initiative for Health & Health Care

Source of Support: Indiana CTSI

Total Award Amount: $152,373   Total Award Period Covered: 01/01/12-06/30/15

Location of Project: Indiana Univesity-Bloomington

Person-Months Per Year Committed to the Project.	0.9	Cal: 0.9	Acad:	Sumr:

*If this project has previously been funded by another agency, please list and furnish information for immediately pre-ceding funding period.

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Current and Pending Support
(See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator: Robert Quick	Other agencies (including NSF) to which this proposal has been/will be submit-

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: Project/Proposal Title: Open Science Grid – The Next Five Years

Source of Support: NSF

Total Award Amount: $3,820,000   Total Award Period Covered: 6/2012 – 5/2016

Location of Project: Indiana University (funding received as subcontract through University of Wisconsin)

Person-Months Per Year Committed to the Project.   Cal: 4.2   Acad: Sumr:

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: Sustaining and Strengthening the US Desk for International Science Grid This Week

Source of Support: NSF

Total Award Amount: $450,000   Total Award Period Covered: 7/2012-6/2104

Location of Project: Indiana University

Person-Months Per Year Committed to the Project.   Cal: 0.0   Acad: Sumr:

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: The Software Assurance Marketplace

Source of Support: DHS

Total Award Amount: $ 1,450,000   Total Award Period Covered: 9/2012 – 8/2016

Location of Project: Indiana University

Person-Months Per Year Committed to the Project.   Cal: 1.2   Acad: Sumr:

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

BD Hubs: Midwest: "SEEDCorn: Sustainable Enabling Environment for Data collaboration" **< This Proposal**

Source of Support: NSF

Total Award Amount: $ 95,000   Total Award Period Covered: 9/1/2015-08/31/2018

Location of Project: Multi-site, University of Illinois, Urbana-Champaign, lead

Person-Months Per Year Committed to the Project.   Cal: 0.00   Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

Current and Pending Support
(See GPG Section II.C.2.h for guidance on information to include on this form.)

Investigator: Daniel Reed	Other agencies (including NSF) to which this proposal has been/will be submitted.

Support: ☒ Current   ☐ Pending   ☐ Submission Planned in Near Future   ☐ *Transfer of Support

Project/Proposal Title: MOBILE DEVICES, SENSORS AND BIG DATA: Transforming Research and Practice

Source of Support: Roy J. Carver Charitable Trust
Total Award Amount: $ 566,540   Total Award Period Covered: 08/01/2013 - 07/31/2015
Location of Project: Iowa City, Iowa
Person-Months Per Year Committed to the Project.   Cal:0.10   Acad: 0.00   Sumr: 0.00

Support: ☒ Current   ☐ Pending   ☐ Submission Planned in Near Future   ☐ *Transfer of Support

Project/Proposal Title: EAGER: Resilient , Energy Efficient HPC System Configuration

Source of Support: NSF
Total Award Amount: $ 298,828   Total Award Period Covered: 10/01/2013 - 09/30/2015
Location of Project: University of Iowa
Person-Months Per Year Committed to the Project.   Cal:0.24   Acad: 0.00   Sumr: 0.00

Support: ☒ Current   ☐ Pending   ☐ Submission Planned in Near Future   ☐ *Transfer of Support

Project/Proposal Title: Medical Technology Development & Research - UIF Special Award

Source of Support: Roy J. Carver Charitable Trust
Total Award Amount: $565,540   Total Award Period Covered: 07/01/2013 - 06/30/2015
Location of Project:
Person-Months Per Year Committed to the Project.   Cal: 0.00   Acad: Sumr:

Support: ☐ Current   ☒ Pending   ☐ Submission Planned in Near Future   ☐ *Transfer of Support

Project/Proposal Title: II-NEW: A Research and Education Infrastructure for Social Media Data Analytics

Source of Support: NSF
Total Award Amount: $877,308   Total Award Period Covered: 08/01/2015 - 07/31/2018
Location of Project:
Person-Months Per Year Committed to the Project.   Cal: 0.00   Acad: Sumr:

Support: ☐ Current   ☒ Pending   ☐ Submission Planned in Near Future   ☐ *Transfer of Support

Project/Proposal Title:
BD Hubs: Midwest: SEEDCorn: Sustainable Enabling Environment for Data Colabaoration
(this proposal)

Source of Support: NSF
Total Award Amount: $1,250,000   Total Award Period Covered: 9/1/15-8/31/18
Location of Project: University of Illinois at Urbana-Champaign
Person-Months Per Year Committed to the Project.   Cal: 0.40   Acad: Summ:

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*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

Current and Pending Support
(See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator: Vallabh Sambamurthy	Other agencies (including NSF) to which this proposal has been/will be submitted.

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

BD Hubs: Midwest: SEEDCorn: Sustainable Enabling Environment for Data Collaboration

(this proposal)

Source of Support: NSF

Total Award Amount: $1,250,000   Total Award Period Covered: 9/1/15-8/31/18

Location of Project: University of Illinois at Urbana-Champaign

Person-Months Per Year Committed to the Project.   0.0   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

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*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

NSF Form 1239 (10/99)   USE ADDITIONAL SHEETS AS NECESSARY

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Current and Pending Support

Andrew Saykin, Psy.D.:

ACTIVE:

NIH (Saykin)   8/15/07 – 6/30/15
R01 AG019771 $1,706,116 (total award)
Memory Circuitry in MCI and Early Alzheimer's Disease
(Location: Indianapolis, IN)   0.36 cal. months

NIA (Saykin)   7/1/11 – 6/30/16
P30 AG010133 $9,114,038 (total award)
Indiana Alzheimer's Disease Center: Neuroimaging Core
(Location: Indianapolis, IN)   2.16 cal. months

Northern California Institute for Research & Education (Saykin)
U01 AG24904 NIH pass through   9/1/10-8/31/15
Alzheimer's Disease Neuroimaging Initiative $2,205,150 (total award)
(Location: Indianapolis, IN)   2.4 cal. months

NSF (Shen)   8/1/11 – 7/31/15 (NCE)
IIS-1117335 $216,000 (total award)
III: Small: Collaborative Research: A Large-Scale Data Mining Framework for Genome-Wide
Mapping of Multi-Modal Phenotypic Biomarkers and Outcome Prediction
(Location: Indianapolis, IN)   0 cal. months

NCIRE (PI: Weiner; Core Leader: Saykin)   2/21/13 – 2/20/16
W81XWH-12-2-0012 DOD Federal Pass-Through $222,134 (total award)
Effects of traumatic brain injury (TBI) and post traumatic stress disorder (PTSD) on Alzheimer's
disease (AD)
(Location: Indianapolis, IN)   0.12 cal. months

NLM (Shen)   9/1/12 – 8/31/16
R01 LM011360 $1,427,315 (total award)
Bioinformatics Strategies for Multidimensional Brain Imaging Genetics
(Location: Indianapolis, IN)   0.96 cal. months

Indiana State Department of Health (Keiski)   8/1/12 – 7/31/15
Research Grant $120,000 (total award)
Imaging the Microglial Response to Traumatic Brain Injury Using TSPO Tracer PBR28
(Location: Indianapolis, IN)   0.12 cal. months

NIH/NCATS (Breier)   6/18/13 – 5/31/16
UH2 TR000955 $3,823,862 (total award)
The Efficacy and Safety of a Selective Estrogen Receptor Beta agonist (LY500307) for Negative
Symptoms and Cognitive Impairment Associated with Schizophrenia
(Location: Indianapolis, IN)   1.2 cal. months

University of Washington (Saykin)   7/1/13 – 6/30/19
U01 AG016976 NIH – Federal Pass-through $35,412 (total award)
National Alzheimer's Coordinating Center
(Location: Indianapolis, IN)   0.12 cal. months

NIH R01MH098062 (Saykin)   8/1/13 – 7/31/18
UCSF – NIH Federal Pass-through $264,460 (total award)
Characterizing Cognitive Decline in Late Life Depression: The ADNI-D Project
(Location: Indianapolis, IN)   0.24 cal. months

Indiana State Department of Health (Saykin)   1/1/14 – 12/31/15
Research Grant $120,000 (total award)
Indiana TBI Genetics, Biomarker and Imaging Neurorepository
(Location: Indianapolis, IN)   0.12 cal. months

NCIRE (PI: Weiner; Core Leader: Saykin)   9/30/13 – 9/29/15
W81XWH-13-1-0259 DOD Federal Pass-Through $229,070 (total award)
Effects of Traumatic Brain Injury and Post-Traumatic Stress Disorder on Alzheimer's Disease
(AD) in Veterans with Mild Cognitive Impairment (MCI) using the Alzheimer's Disease
Neuroimaging Initiative (ADNI)
(Location: Indianapolis, IN)   0.12 cal. months

University of Washington (Saykin)   9/1/14 – 8/31/18   1.8 cal months
A01AG042437 NIH Federal Pass-through $540,177 (total award)
Genetic Architecture of Memory and Executive Functioning in Alzheimer's Disease
(Location: Indianapolis, IN)   1.8 cal months

U.S. Department of Defense (McAllister)   9/15/14 – 9/14/17   0.24 cal. months
W81XWH-14-2-0151 $14,635,999 (total award)
THE NCAA-DOD GRAND ALLIANCE: Concussion Assessment, Research and Education
Consortium (CARE)
(Location: Indianapolis, IN)   0.24 cal. months

NIH R01AG0461471 (Saykin)   9/15/14 – 5/31/17
Duke University – NIH Federal Pass-through $187,200 (total award)
Metabolic Networks and Pathways in Alzheimer'
(Location: Indianapolis, IN)   0.96 cal. months

PENDING:

MSKCC (Saykin)   7/1/15 – 6/30/20
NIH – Federal Pass-through $445,354 (total award)
A Neuroimaging and Cognitive Study of Older Stem Cell Transplant Patients
(Location: Indianapolis, IN)   0.6 cal. months

Vanderbilt University (Saykin)   7/1/15 – 6/30/20
NIH – Federal Pass-through $379,305 (total award)
Long-Term Nicotine Treatment of Mild Cognitive Impairment
(Location: Indianapolis, IN)   0.6 cal. months

NIH (Kim)   7/1/15 – 6/30/17
R03 Research Project $156,000 (total award)
Novel Strategies for Blood-based Biomarkers for AD: Role of Genetic Variation in a Multivariate
Framework
(Location: Indianapolis, IN)   0.12 cal. months

NIH (Lahiri)   7/1/15 – 6/30/20
R01 Research Project $1,949,649 (total award)
Neurobiological Role of MicroRNA in Alzheimer's
(Location: Indianapolis, IN)   0.24 cal. months

Arkley Biotech LLC (Saykin)   6/1/15 – 12/31/17
NIH – Federal Pass-through $382,000 (total award)
Commercialization of a Serum Diagnostic for the Detection of Alzheimer's Disease
(Location: Indianapolis, IN)   0.18 cal. months

NCIRE (Saykin)   9/1/15 – 8/31/19
DOD Federal Pass-through $188,961 (total award)
Longitudinal Effects of Traumatic Brain Injury and Posttraumatic Stress Disorder on Alzheimer's
Disease (AD) in Veterans with and without MCI using ADNI
(Location: Indianapolis, IN)   0.12 cal. months

Vanderbilt University (Saykin)   10/1/15 – 9/30/20
NIH Federal Pass-through $462,796 (total award)
South-East Alzheimer's in Down Syndrome (SEADS) Biomarker Study
(Location: Indianapolis, IN)   0.6 cal. months

UCLA (Farlow)   11/1/15 – 10/31/20
NIH Federal Pass-through $569,555 (total award)
Early and Long-Term Health Outcomes of Molecular Cerebral Imaging in Incipient Dementia
(Location: Indianapolis, IN)   0.6 calendar

NSF (Shen)   9/1/15 – 8/31/19
Research Grant $450,000 (total award)
NCS-FO: Collaborative Research: New Computational Framework to Enable Functional and
Genetic Identifications of Neural Circuits for Individual Prediction and Variation Study
(Location: Indianapolis, IN)   0.24 cal. months

UCLA (Saykin)   11/1/15 – 10/31/20
NIH Federal Pass-through $1,368,313 (total award)
Early and Long-Term Outcome of Molecular Cerebral Imaging in Incipient Dementia
(Location: Indianapolis, IN)   0.6 cal. months

NIH (Callahan)   9/1/15 – 8/31/17
R21 Research Grant $437,319 (total award)
Angiogenesis and Alzheimer's Disease
(Location: Indianapolis, IN)   0.6 cal. months

NIH (Liu, Shen, Skaar)   12/1/15 – 11/30/20
R01 Research Grant $3,092,318 (total award)
Regulatory Roles of Genetic Variants in Alzheimer's Disease

(Location: Indianapolis, IN)   0.6 cal. months

NIH (Hulvershorn, Kareken)   10/1/15 – 9/30/20
U01 Research Grant $20,500,000 (total award)
3/9 An Integrated Population Neuroscience Framework for the ABCD Study: IN Site Research
Project
(Location: Indianapolis, IN)   0.6 cal. months

Alzheimer Association (Nho)   9/1/15 – 8/31/17
Research Project $100,000 (total award)
Functional Characterization of Novel miRNA Variants Associated with LOAD
(Location: Indianapolis, IN)   0.12 cal. months

NSF (Shen)   3/1/16 – 2/29/20
Research Grant $750,000 (total award)
BIGDATA: IA: Collaborative Research: Big Data Analytics for Brain Science
(Location: Indianapolis, IN)   0.3 cal. months

NIH (Wu)   4/1/16 – 3/31/21
R03 Research Grant $156,000 (total award)
Microstructural Imaging of the Human Brain with Cognitively Normal Aging and Mild Cognitive
Impairment
(Location: Indianapolis, IN)   0.6 cal. months

MSKCC (Saykin)   4/1/16 – 3/31/21
NIH Federal Pass-through $486,158 (total award)
Cognitive Outcome in Cancer Patients Treated with Stem Cell Transplantation
(Location: Indianapolis, IN)   0.6 cal. months

NIH (Clark)   1/1/16 – 12/31/20
R01 Research Grant $3,647,180 (total award)
MIND Food and Speed of Processing Training in Older Adults with Low Education, The
MINDSpeed Alzheimer's Disease Prevention Pilot Trail
(Location: Indianapolis, IN)   0.6 cal. months

NIH (Nho)   4/1/16 – 3/31/18
R03 Research Grant $167,351 (total award)
Omics Data Integration for Identifying AD Biomarkers on the Systems Level
(Location: Indianapolis, IN)   0.36 cal. months

Alzheimer Association (Li)   10/1/15 – 9/30/17
Research Grant $150,000 (total award)
Type 2 Diabetes and Neurodegeneration in AD and PD
(Location: Indianapolis, IN)   0.12 cal. months

NSF (Plale, IU subaward)   9/1/15-8/31/18
BD Hub – NSF 15-562 $95,000 (total award to IU)
BD Hubs: Midwest: "SEEDCorn: Sustainable Enabling Environment for Data **< This Proposal**
(Location: Multi-site; UIUC, lead)   0.00 cal. months

Current and Pending Support

(See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator: **Caterina Scoglio**	Other agencies (including NSF) to which this proposal has been/will be submitted

Support: ☐ Current ☑ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: **CRISP Type 2: Resilience of Interdependent Socio-Economic Infrastructures with Application to Beef Production and Tranportation Systems**

Source of Support: **National Science Foundation**
Total Award Amount: **$2,478,118**   Total Award Period Covered: **9/1/2015 - 8/31/2018**
Location of Project: **KSU**

Person-Months Per Year Committed to the Project.   Cal: **0**   Acad: **0**   Sumr: **1**

Support: ☐ Current ☑ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: **p-Modulus on Networks with Applications to the Study of Epidemics**

Source of Support: **National Science Foundation**
Total Award Amount: **$605,554**   Total Award Period Covered: **6/1/2015 - 5/31/2018**
Location of Project: **KSU**

Person-Months Per Year Committed to the Project.   Cal: **0**   Acad: **0**   Sumr: **1**

Support: ☐ Current ☑ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: **Long-distance Dispersal and Disease Outbreaks: Effects of Initial Prevalence, Basic Reproduction Number, and Control Tactics**

Source of Support: **National Science Foundation**
Total Award Amount: **$213,456**   Total Award Period Covered: **9/1/2015 - 8/31/2020**
Location of Project: **KSU**

Person-Months Per Year Committed to the Project.   Cal: **0**   Acad: **0**   Sumr: **0**

Support: ☑ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: **SCH: RAPID: Effectiveness of Contact Tracing for Detection of Ebola Risk during Early Introduction of the Virus within the USA**

Source of Support: **National Science Foundation**
Total Award Amount: **$137,209**   Total Award Period Covered: **12/1/2014 - 11/30/2015**
Location of Project: **KSU**

Person-Months Per Year Committed to the Project.   Cal: **0**   Acad: **0**   Sumr: **1**

*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

Current and Pending Support

(See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator: **Caterina Scoglio**

Other agencies (including NSF) to which this proposal has been/will be submitted

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Support: ☑ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: **Modeling Japanese Encephalitits in US using Interconnected Networks**

Source of Support: **US Department of Agriculture**
Total Award Amount: **$151,048**   Total Award Period Covered: **9/1/2014 - 8/31/2018**
Location of Project: **KSU**

Person-Months Per Year Committed to the Project.   Cal: **0**   Acad: **0**   Sumr: **2.7**

Support: ☑ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: **CIF: Small: Spreading Processes over Multilayer and Interconnected Networks**

Source of Support: **National Science Foundation**
Total Award Amount: **$499,542**   Total Award Period Covered: **7/15/2014 - 6/30/2017**
Location of Project: **KSU**

Person-Months Per Year Committed to the Project.   Cal: **0**   Acad: **0**   Sumr: **0.5**

Support: ☑ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: **CC-NIE Network Infrastructure: KGAP: Bridging the Gap on Network Flexibility and Performance for Genomics and Data-Intensive Research at Kansas State University**

Source of Support: **National Science Foundation**
Total Award Amount: **$499,113**   Total Award Period Covered: **11/1/2013 - 10/31/2015**
Location of Project: **KSU**

Person-Months Per Year Committed to the Project.   Cal: **0**   Acad: **0**   Sumr: **0**

Support: ☑ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: **Ecology of Sitophilus and Cryptolestes Species**

Source of Support: **CRC Plant Biosecurity**
Total Award Amount: **$225,930**   Total Award Period Covered: **1/1/2013 - 12/31/2015**
Location of Project: **KSU**

Person-Months Per Year Committed to the Project.   Cal: **0.18**   Acad: **0**   Sumr: **0**

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*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

Current and Pending Support

(See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator: **Caterina Scoglio**

Other agencies (including NSF) to which this proposal has been/will be submitted

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Support: ☑ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: **Problems in Function Theory with Applications**

Source of Support: **National Science Foundation**
Total Award Amount: **$187,267**   Total Award Period Covered: **6/1/2012 - 5/31/2016**
Location of Project: **KSU**

Person-Months Per Year Committed to the Project.   Cal: **0**   Acad: **0**   Sumr: **0**

Support: ☑ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: **Network Based Modeling of Arthropods, Humans, and Animals to Better Understand Vector-Borne Disease Transmission**

Source of Support: **US Department of Agriculture**
Total Award Amount: **$30,000**   Total Award Period Covered: **9/1/2011 - 8/31/2015**
Location of Project: **KSU**

Person-Months Per Year Committed to the Project.   Cal: **0**   Acad: **1.35**   Sumr: **0**

Support: ☑ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: **Kansas Bioscience Matching Fund Program**

Source of Support: **Kansas Bioscience Authority**
Total Award Amount: **$4,000,000**   Total Award Period Covered: **12/21/2010 - 3/31/2028**
Location of Project: **KSU**

Person-Months Per Year Committed to the Project.   Cal: **0**   Acad: **0**   Sumr: **0**

Support: ☑ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: **Kansas Wind Energy Consortium**

Source of Support: **US Department of Energy**
Total Award Amount: **$713,625**   Total Award Period Covered: **12/4/2009 - 9/30/2015**
Location of Project: **KSU**

Person-Months Per Year Committed to the Project.   Cal: **0**   Acad: **0.9**   Sumr: **0.5**

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*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

Current and Pending Support
(See GPG Section II.C.2.h for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator: Caterina Scoglio	Other agencies (including NSF) to which this proposal has been/will be submitted.

Support: □ Current   ☒ Pending   □ Submission Planned in Near Future   □ *Transfer of Support

Project/Proposal Title: BD Hubs: Midwest: "SEEDCorn: Sustainable Enabling Environment for Data Collaboration" (This Proposal)

Source of Support: NSF
Total Award Amount: $ 1,250,000 Total Award Period Covered: 09/01/15 - 08/31/18
Location of Project: University of Illinois at Urbana-Champaign
Person-Months Per Year Committed to the Project.   Cal:0.00   Acad: 0.00   Sumr: 0.00

Support: □ Current   □ Pending   □ Submission Planned in Near Future   □ *Transfer of Support

Project/Proposal Title:

Source of Support:
Total Award Amount: $ Total Award Period Covered:
Location of Project:
Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: □ Current   □ Pending   □ Submission Planned in Near Future   □ *Transfer of Support

Project/Proposal Title:

Source of Support:
Total Award Amount: $ Total Award Period Covered:
Location of Project:
Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: □ Current   □ Pending   □ Submission Planned in Near Future   □ *Transfer of Support

Project/Proposal Title:

Source of Support:
Total Award Amount: $ Total Award Period Covered:
Location of Project:
Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: □ Current   □ Pending   □ Submission Planned in Near Future   □ *Transfer of Support

Project/Proposal Title:

Source of Support:
Total Award Amount: $ Total Award Period Covered:
Location of Project:
Person-Months Per Year Committed to the Project.   Cal: Acad: Summ:

*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

Current and Pending Support
(See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator: Lior Shamir	Other agencies (including NSF) to which this proposal has been/will be submitted.

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Integrating computational science research into undergraduate social sciences, biology, and humanities courses

Source of Support: AAC&U

Total Award Amount: $293,000   Total Award Period Covered: 6/1/14-9/30/16

Location of Project: Michigan Technological University

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr: 1.5

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

BIGDATA:IA: Query-by-example for Big astronomical Data

Source of Support: NSF

Total Award Amount: $115,435   Total Award Period Covered: 1/15/16-1/14/19

Location of Project: Michigan Technological University

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr: 1.0

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

BD Hubs: Midwest: SEEDCorn: Sustainable Enabling Environment for Data Collaboration
(this proposal)

Source of Support: NSF

Total Award Amount: $1,250,000   Total Award Period Covered: 9/1/15-8/31/18

Location of Project: Michigan Technological University

Person-Months Per Year Committed to the Project.   0.0   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

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*If this project has previously been funded by another agency, please list and furnish information for immediately pre-ceding funding period.

NSF Form 1239 (10/99)   USE ADDITIONAL SHEETS AS NECESSARY

Current and Pending Support

(See GPG Section II.D.8 for guidance on information to include on this form.)

<table>
<tr><td colspan="2">The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.</td></tr>
<tr><td>Investigator: Shashi Shekhar</td><td>Other agencies (including NSF) to which this proposal has been/will be submitted.
None.</td></tr>
</table>

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: *BD Hubs: Midwest: "SEEDCorn: Sustainable Enabling Environment for Data Collaboration (This Proposal)*

Source of Support: NSF

Total Award Amount: $1.25 M (approx..)   Total Award Period Covered: 9/1/2015-8/31/2018

Location of Project: *University of Minnesota*

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: *III: Small: Investigating Spatial Big Data for Next Generation Routing Services*

Source of Support: NSF

Total Award Amount: $ 500 K (approx..)   Total Award Period Covered: *9/1/2013 to 8/31/2016*

Location of Project: *University of Minnesota*

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr: 0.75

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: *Expedition: Understanding Climate Change: A Data Driven Approach*

Source of Support: *NSF*

Total Award Amount: $6.1 M (approx.)   Total Award Period Covered: 8/2010 – 8/2016

Location of Project: University of Minnesota

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr: 0.75

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: *Datanet: Terra Populus: A Global Population Environment Data Network*

Source of Support: NSF

Total Award Amount: $7M *(approx.)*   Total Award Period Covered: 09/01/2011 – *08/31/2015*

Location of Project: *University of Minnesota*

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr: 0.25

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: *Identifying and Analyzing Patterns of Evasion*

Source of Support: *USDOD (NGA)*

Total Award Amount: $45*0,000*   Total Award Period Covered: *6/10/2013 – 6/09/2016*

Location of Project: *University of Minnesota*

Person-Months Per Year Committed to the Project.   Cal: 1   Acad: Sumr:

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*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

NSF Form 1239 (10/99)   USE ADDITIONAL SHEETS AS NECESSARY

Current and Pending Support
(See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator: *Shashi Shekhar*	Other agencies (including NSF) to which this proposal has been/will be submitted.

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: : *III:Small: Towards Spatial Database Management Systems for Flash Memory Storage*

Source of Support: *NSF*

Total Award Amount: $500,000 Total Award Period Covered: *9/01/2012 – 8/31/2016*

Location of Project: University of Minnesota

Person-Months Per Year Committed to the Project. Cal: 0 Acad: 0 Sumr: 0.3

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: *BIGDATA:IA: Advancing Spatio-Temporal-Graph Big Data Science and Engineering for*

Future Connected Vehicles

Source of Support: NSF

Total Award Amount: 1.92M (approx..) Total Award Period Covered: 01/01/2016 – 12/31/2019

Location of Project: University of Minnesota

Person-Months Per Year Committed to the Project. Cal: 1 Acad: Sumr:

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: II-NEW: Research Infrastructure for Big Spatial and Temporal Data

Source of Support: NSF

Total Award Amount: 391K (approx..) Total Award Period Covered: 07/01/15 – 06/30/18

Location of Project: *University of Minnesota*

Person-Months Per Year Committed to the Project. 1 percent Cal: Acad: Sumr:

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: *Collaborative Research: CyberSEES: Type 2: Geonome:*

A spatio-temporal-spectral Landsat archive to monitor human sustainability

Source of Support : NSF

Total Award Amount: $574,200 Total Award Period Covered: 09/01/15 – 08/31/19

Location of Project: University of Minnesota

Person-Months Per Year Committed to the Project. Cal: Acad: Sumr: 1

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: *Ephemeral Network Broker to facilitate Future Mobility Business Models/transactions.*

Source of Support: Ford University Research Program

Total Award Amount: 120,000 Total Award Period Covered: 01/01/2015-12/31/2017

Location of Project: University of Minnesota

Person-Months Per Year Committed to the Project. Cal: 0.25 Acad: Sumr:

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*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

NSF Form 1239 (10/99) USE ADDITIONAL SHEETS AS NECESSARY

Current and Pending Support
(See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.	
Investigator: Kevin Smith	Other agencies (including NSF) to which this proposal has been/will be submitted.

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: BD Hubs: Midwest: "SEEDCorn: Sustainable Enabling Environment for Data Collaboration" (This Proposal)

Source of Support: NSF

Total Award Amount: $95,000 Total Award Period Covered: 09/01/2015 – 08/31/2018

Location of Project: University of Michigan

Person-Months Per Year Committed to the Project. Cal: 0.0 Acad: Sumr:

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: Supporting the Open Science tranSMART Community

Source of Support: tranSMART Foundation

Total Award Amount: $166,738 Total Award Period Covered: 12/01/2014 – 11/30/2015

Location of Project: University of Michigan

Person-Months Per Year Committed to the Project. Cal: 6.0 Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project. Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project. Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project. Cal: Acad: Sumr:

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*If this project has previously been funded by another agency, please list and furnish information for immediately pre-ceding funding period.

NSF Form 1239 (10/99) USE ADDITIONAL SHEETS AS NECESSARY

Current and Pending Support
(See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.	
Investigator: Olaf Sporns	Other agencies (including NSF) to which this proposal has been/will be submit- n/a

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Mapping the Human Connectome: Structure, Function, and Heritability

Source of Support: NIH 1U54MH091657

Total Award Amount: $8,240/current yr   Total Award Period Covered: 09/15/10-09/14/15

Location of Project: Indiana University

Person-Months Per Year Committed to the Project.   0.5   Cal: 0.5   Acad: Sumr:

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Connectivity and Information Flow in a Complex Brain

Source of Support: NSF 1212778 – subcontract from UCSD

Total Award Amount: $16,977/current yr   Total Award Period Covered: 09/01/12 – 08/31/16

Location of Project: UCSD

Person-Months Per Year Committed to the Project.   0.75   Cal: 0.75   Acad: Sumr:

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Cerebellar Dysfunction in Schizophrenia

Source of Support: NIH 5R01MH074983

Total Award Amount: $4,000/current yr   Total Award Period Covered: 09/01/12-08/31/17

Location of Project: Indiana Univresity

Person-Months Per Year Committed to the Project.   0.25   Cal: 0.25   Acad: Sumr:

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Testing Network-Based Hubs through Lesion Analysis

Source of Support: JS McDonnell Foundation (#220020387)

Total Award Amount: $43,858   Total Award Period Covered: 06/01/14-06/01/18

Location of Project: University of Iowa

Person-Months Per Year Committed to the Project.   1.0   Cal: 1.0   Acad: Sumr:

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Graph Theoretic Analysis of Brain Networks in Cannabis Users

Source of Support: NIH 1R21DA035493

Total Award Amount: $8,240/current   Total Award Period Covered: 09/01/14-08/31/17

Location of Project: Indiana University

Person-Months Per Year Committed to the Project.   0.5   Cal: 0.5   Acad: Sumr:

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*If this project has previously been funded by another agency, please list and furnish information for immediately pre-ceding funding period.

NSF Form 1239 (10/99)   USE ADDITIONAL SHEETS AS NECESSARY

Current and Pending Support
(See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.	
Investigator: Olaf Sporns (continued)	Other agencies (including NSF) to which this proposal has been/will be submitted. n/a

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support
Project/Proposal Title:

Communication Dynamics in the Human Connectome and Individual Differences in Brain Function

Source of Support: National Science Foundation (1532381)
Total Award Amount: $212,141/yr 1   Total Award Period Covered: 08/01/15-07/31/18
Location of Project: Indiana University

Person-Months Per Year Committed to the Project.	0.5	Cal: 0.5	Acad:	Sumr:

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support
Project/Proposal Title:

Computational Models Linking Connectomics and Large-Scale Dynamics of the Human Brain

Source of Support: NIH/NCCIH (1 R01 AR009036-01)
Total Award Amount: $93,358/yr 1   Total Award Period Covered: 07/01/15-06/30/18
Location of Project: Indiana University

Person-Months Per Year Committed to the Project.	1.0	Cal: 1.0	Acad:	Sumr:

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support
Project/Proposal Title:

MIND: Machine Intelligence via Neuroscientific Discovery

Source of Support: Intelligence Advanced Projects Research Agency - MICRONS
Total Award Amount: $33,664   Total Award Period Covered: 09/01/15-08/31/20
Location of Project: Indiana University

Person-Months Per Year Committed to the Project.	1.0	Cal: 1.0	Acad:	Sumr:

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support
Project/Proposal Title:

BD Hubs: Midwest: "SEEDCorn: Sustainable Enabling Environment for Data Collaboration" < This Proposal

Source of Support: NSF
Total Award Amount: $ 95,000   Total Award Period Covered: 09/01/15-08/31/18
Location of Project: Multi-site; University of Illinois, Urbana-Champaign, lead

Person-Months Per Year Committed to the Project.	0.0	Cal: 0.0	Acad:	Sumr:

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support
Project/Proposal Title:

Indiana University Network Science Institute

Source of Support: Indiana University-Offices of the President, Provost & VP for Research
Total Award Amount: $7,000,000   Total Award Period Covered: 01/01/15-12/31/17
Location of Project: Indiana University

Person-Months Per Year Committed to the Project.	1.0	Cal:	Acad:	Sumr: 1.0

*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

NSF Form 1239 (10/99)   USE ADDITIONAL SHEETS AS NECESSARY

Current and Pending Support

(See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator: **John Towns**

Other agencies (including NSF) to which this proposal has
None

Support: ☒ Current	☐ Pending	☐ Submission Planned in Near Future	☐ *Transfer of Support

Project/Proposal Title:

XSEDE: eXtreme Science and Engineering Discovery Environment

Source of Support: NSF

Total Award Amount: $ $121M   Total Award Period Covered: 7/1/2011 - 6/30/2016

Location of Project: University of Illinois at Urbana-Champaign

Person-Months Per Year Committed to the Project.   Cal: 8.2   Acad: Sumr:

Support: ☒ Current	☐ Pending	☐ Submission Planned in Near Future	☐ *Transfer of Support

Project/Proposal Title:

Evaluating and Enhancing the eXtreme Digital (XD) Cyberinfrastructure for Maximum Usability and Science Impact

Source of Support: NSF

Total Award Amount: $9,257,713   Total Award Period Covered: 7/1/10-6/30/15

Location of Project: University of Illinois at Urbana-Champaign

Person-Months Per Year Committed to the Project.   Cal: 1.4   Acad: Sumr:

Support: ☒ Current	☐ Pending	☐ Submission Planned in Near Future	☐ *Transfer of Support

Project/Proposal Title:

Cy-Tera: A Multi-Teraflop/s computing facility for Science and Technology in Cyprus

Source of Support: Cyprus Research Promotion Foundation

Total Award Amount: €1,099,998   Total Award Period Covered: 3/31/2011 - 03/7/2016

Location of Project: Cyprus Institute, Nicosia, Cyprus

Person-Months Per Year Committed to the Project.   Cal: 1.2   Acad: Sumr:

Support: ☒ Current	☐ Pending	☐ Submission Planned in Near Future	☐ *Transfer of Support

Project/Proposal Title:

Leadership Class Scientific and Engineering Computing: Breaking Through the Limits (Track 1)

Source of Support: National Science Foundation

Total Award Amount: $207,965,880   Total Award Period Covered: 10/1/2007 – 3/31/2016

Location of Project: University of Illinois at Urbana-Champaign

Person-Months Per Year Committed to the Project.   Cal: 0   Acad: Sumr:

Support: ☒ Current	☒ Pending	☐ Submission Planned in Near Future	☐ *Transfer of Support

Project/Proposal Title:

MRI: Acquisition of a National CyberGIS Facility for Computing and Data-Intensive Geospatial Research and Education

Source of Support: NSF

Total Award Amount: $4,000,000   Total Award Period Covered: 10/01/2014 - 09/30/2018

Location of Project: University of Illinois Urbana-Champaign

Person-Months Per Year Committed to the Project.   Cal: 0.00   Acad: Sumr:

*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

Current and Pending Support
(See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator: John Towns (page 2 of 2)	Other agencies (including NSF) to which this proposal has been/will be submitted. None

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

CC*IIE Integration: High-Throughput Network Supporting Collaborative Science

Source of Support: NSF

Total Award Amount: $1,000,000　　　Total Award Period Covered: 03/06/15 - 03/05/17

Location of Project: University of Illinois Urbana-Champaign

Person-Months Per Year Committed to the Project.　Cal: 0.00　Acad:　Sumr:

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

SAVI: GECAT - Global Initiative to enhance @scale and distributed computing and analysis technologies to address grand challenge problems around the world

Source of Support: NSF

Total Award Amount: $2,000,000　　　Total Award Period Covered: 09/01/14 - 08/31/19

Location of Project: University of Illinois Urbana-Champaign

Person-Months Per Year Committed to the Project.　Cal: 0.00　Acad:　Sumr:

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

The Centrality of Advanced Digitally ENabled Science: CADENS

Source of Support: NSF

Total Award Amount: $1,499,535　　　Total Award Period Covered: 06/01/14 - 05/31/17

Location of Project: University of Illinois Urbana-Champaign

Person-Months Per Year Committed to the Project.　Cal: 0.00　Acad: 0.00　Sumr: 0.00

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

CC*DNI DIBBS: Merging Science and Cyberinfrastructure Pathways: The Whole Tale

Source of Support: NSF

Total Award Amount: $4,986,951　　　Total Award Period Covered: 1/1/16-12/31/20

Location of Project: University of Illinois Urbana-Champaign

Person-Months Per Year Committed to the Project.　Cal: 0.0　Acad:　Sumr:

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Accelerating access to large materials datasets: Building, deploying and operating a Materials Data Facility

Source of Support: University of Chicago (NIST Prime)

Total Award Amount: $450,000　　　Total Award Period Covered: 5/1/15-4/30/18

Location of Project: University of Illinois Urbana-Champaign

Person-Months Per Year Committed to the Project.　Cal: 0.0　Acad:　Sumr:

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*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

Current and Pending Support
(See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator: John Towns	Other agencies (including NSF) to which this proposal has been/will be submitted.

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

XSEDE 2.0: Integrating, Enabling and Enhancing National Cyberinfrastructure with Expanding Community Involvement

Source of Support: NSF

Total Award Amount: $120,000,000   Total Award Period Covered: 7/1/16-6/30/21

Location of Project: University of Illinois Urbana-Champaign

Person-Months Per Year Committed to the Project.   Cal: 7.2   Acad: Sumr:

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

BD Hubs: Midwest: SEEDCorn: Sustainable Enabling Environment for Data Collaboration
(this proposal)

Source of Support: NSF

Total Award Amount: $1,250,000   Total Award Period Covered: 9/1/15-8/31/18

Location of Project: University of Illinois Urbana-Champaign

Person-Months Per Year Committed to the Project.   0   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

*If this project has previously been funded by another agency, please list and furnish information for immediately pre-ceding funding period.

Current and Pending Support
(See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator: Matthew Turk	Other agencies (including NSF) to which this proposal has been/will be submitted.

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

SI2-SSE: yt: Reusable Components for Simulating, Analyzing and Visualizing Astrophysical Systems

Source of Support: NSF

Total Award Amount: $493,793   Total Award Period Covered: 10/1/2013-9/31/2016

Location of Project: University of Illinois at Urbana-Champaign

Person-Months Per Year Committed to the Project.   Cal: .50   Acad: Sumr:

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Changing How We Conduct Inquiry

Source of Support: Gordon and Betty Moore Foundation

Total Award Amount: $1,500,000   Total Award Period Covered: 11/10/2014-11/9/2019

Location of Project: University of Illinois at Urbana-Champaign

Person-Months Per Year Committed to the Project.   Cal: 3.0   Acad: Sumr:

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Cold Galaxies on FIRE: Modeling the Most Luminous Starbursts in the Universe with Cosmological Zoom Simulations (Co-I)

Source of Support: Hubble Space Telescope

Total Award Amount: $70,021   Total Award Period Covered: 1/1/2015-12/31/2015

Location of Project: Columbia University

Person-Months Per Year Committed to the Project.   0   Cal: Acad: Sumr:

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

MAST Interface to Synthetic Telescopes with yt {MISTY}: Observing Simulations of the Intergalactic Medium (Co-I)

Source of Support: Hubble Space Telescope

Total Award Amount: $pending   Total Award Period Covered: 1/1/2015-12/31/2015

Location of Project: Columbia University

Person-Months Per Year Committed to the Project.   0   Cal: Acad: Sumr:

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Software Infrastructure for Sustained Innovation - A 2015 SI^2 PI Workshop (Co-I)

Source of Support: NSF

Total Award Amount: $75,257   Total Award Period Covered: 1/2/15-1/1/16

Location of Project: Arizona State University

Person-Months Per Year Committed to the Project.   0   Cal: Acad: Sumr:

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*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

Current and Pending Support
(See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.	
Investigator: Matthew Turk	Other agencies (including NSF) to which this proposal has been/will be submitted.

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Collaborative Research: Immersive Numerical Laboratories: Analysis-Driven Supercomputing

Source of Support: National Science Foundation

Total Award Amount: $1,734,923   Total Award Period Covered: 10/1/15-9/30/20

Location of Project: University of Illinois at Urbana-Champaign

Person-Months Per Year Committed to the Project.   Cal: 1.0   Acad: Sumr:

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

BD Hubs: Midwest: "SEEDCorn: Sustainable Enabling Environment for Data Collaboration"
(this proposal)

Source of Support: NSF

Total Award Amount: $1,250,000   Total Award Period Covered: 9/1/15-8/31/18

Location of Project: University of Illinois at Urbana-Champaign

Person-Months Per Year Committed to the Project.   0.0   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

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*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

Current and Pending Support
(See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator: Shaowen Wang	Other agencies (including NSF) to which this proposal has been/will be submitted. N/A

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

SI2-SSI: CyberGIS Software Integration for Sustained Geospatial Innovation
PI

Source of Support: NSF

Total Award Amount: $4,430,000   Total Award Period Covered: 10/1/10-9/30/15

Location of Project: University of Illinois at Urbana-Champaign

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr: 1.0

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

CAREER: Formalizing and Resolving Computational Intensity of Spatial Analysis to Establish a Cyber-GIS Framework
PI

Source of Support: NSF

Total Award Amount: $470,00   Total Award Period Covered: 8/1/09-7/31/15

Location of Project: University of Illinois at Urbana-Champaign

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr: .65

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

THE OPEN SCIENCE GRID: The Next Five Years: Distributed High Throughput Computing for the Nation's Scientists, Researchers, Educators, and Students
PI

Source of Support: University of Wisconsin at Madison (NSF Prime)

Total Award Amount: $855,000   Total Award Period Covered: 6/1/12-5/31/17

Location of Project: University of Illinois at Urbana-Champaign

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Resource Management Mapping Services
PI

Source of Support: Environmental Progection Agency

Total Award Amount: $310,000   Total Award Period Covered: 8/31/12-7/31/16

Location of Project: University of Illinois at Urbana-Champaign

Person-Months Per Year Committed to the Project.   Cal: 1.0   Acad: Sumr:

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

BIGDATA: Mid-Scale: DA: ESCE: A Unified Cyberinfrastructure Framework for Scalable Spatiotemporal Data Analytics
PI

Source of Support: NSF

Total Award Amount: $300,000   Total Award Period Covered: 9/1/13-8/31/15

Location of Project: University of Illinois at Urbana-Champaign

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr: .50

*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

Current and Pending Support
(See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator: Shaowen Wang	Other agencies (including NSF) to which this proposal has been/will be submitted. N/A

Support: ☒ Current   ☐ Pending   ☐ Submission Planned in Near Future   ☐ *Transfer of Support

Project/Proposal Title:

MRI: Acquisition of a National CyberGIS Facility for Computing and Data-Intensive Geospatial Research and Education

PI

Source of Support: NSF

Total Award Amount: $1,787,335   Total Award Period Covered: 10/1/14-9/30/17

Location of Project: University of Illinois at Urbana-Champaign

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☒ Current   ☐ Pending   ☐ Submission Planned in Near Future   ☐ *Transfer of Support

Project/Proposal Title:

CIF21 DIBBs: Scalable Capabilities for Spatial Data Synthesis

PI

Source of Support: NSF

Total Award Amount: $1,499,998   Total Award Period Covered: 10/1/14-9/30/17

Location of Project: University of Illinois at Urbana-Champaign

Person-Months Per Year Committed to the Project.   Cal: 1.0   Acad: Sumr:

Support: ☒ Current   ☐ Pending   ☐ Submission Planned in Near Future   ☐ *Transfer of Support

Project/Proposal Title:

CyberGIS Capabilities for the National Map

PI

Source of Support: USGS

Total Award Amount: $120,000   Total Award Period Covered: 8/16/14-8/15/19

Location of Project: University of Illinois at Urbana-Champaign

Person-Months Per Year Committed to the Project.   Cal: 1.0   Acad: Sumr:

Support: ☐ Current   ☒ Pending   ☐ Submission Planned in Near Future   ☐ *Transfer of Support

Project/Proposal Title:

A Network for Understanding Cities and Water: Advancing Sustainability Science through Systems Thinking, Comparative Analysis, and Communicative Action

Co-PI

Source of Support: NSF

Total Award Amount: $11,865,635   Total Award Period Covered: 9/15/14-9/14/18

Location of Project: University of Illinois at Urbana-Champaign

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr: 1.0

Support: ☐ Current   ☒ Pending   ☐ Submission Planned in Near Future   ☐ *Transfer of Support

Project/Proposal Title:

Critical Infrastructures Resilience Center (CIRC)

PI

Source of Support: DHS

Total Award Amount: $500,000   Total Award Period Covered: 4/1/15-6/30/20

Location of Project: University of Illinois at Urbana-Champaign

Person-Months Per Year Committed to the Project.   Cal: 4.3   Acad: Sumr:

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*If this project has previously been funded by another agency, please list and furnish information for immediately pre-ceding funding period.

NSF Form 1239 (10/99)   USE ADDITIONAL SHEETS AS NECESSARY

Current and Pending Support
(See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator: Shaowen Wang

Other agencies (including NSF) to which this proposal has been/will be submitted.

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

BIGDATA: IA: AN EXTREME-SCALE COMPUTATIONAL APPROACH TO ZONING OPTIMIZATION

Source of Support: NSF

Total Award Amount: $466,804 Total Award Period Covered: 9/1/15-8/31/18

Location of Project: University of Illinois at Urbana-Champaign

Person-Months Per Year Committed to the Project. Cal: Acad: Sumr: 1.0

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

BD Hubs: Midwest: SEEDCorn: Sustainable Enabling Environment for Data Collaboration

(this proposal)

Source of Support: NSF

Total Award Amount: $1,250,000 Total Award Period Covered: 9/1/15-8/31/18

Location of Project: University of Illinois at Urbana-Champaign

Person-Months Per Year Committed to the Project. 0.0 Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project. Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project. Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project. Cal: Acad: Sumr:

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*If this project has previously been funded by another agency, please list and furnish information for immediately pre-ceding funding period.

NSF Form 1239 (10/99) USE ADDITIONAL SHEETS AS NECESSARY

55

Current and Pending Support
(See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator: Scott Wilkin

Other agencies (including NSF) to which this proposal has been/will be submitted.

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

BD Hubs: Midwest: SEEDCorn: Sustainable Enabling Environment for Data Collaboration (This Proposal)

Source of Support: NSF

Total Award Amount: $1,250,000   Total Award Period Covered: 9/1/2015-8/31/2018

Location of Project: University of Illinois at Urbana-Champaign

Person-Months Per Year Committed to the Project.   Cal: 0   Acad: 0   Sumr: 0

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

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*If this project has previously been funded by another agency, please list and furnish information for immediately pre-ceding funding period.

Current and Pending Support
(See GPG Section II.D.8 for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator: Alex Yahja	Other agencies (including NSF) to which this proposal has been/will be submitted. NSF

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

CDI-Type II: Collaborative Research: Groupscope: Instrumenting Research on Interaction Networks in Complex Social Contexts

Source of Support: NSF

Total Award Amount: $1,697,482   Total Award Period Covered: September 2010 to August 2015 (estimated)

Location of Project: NCSA, University of Illinois, Northwestern University

Person-Months Per Year Committed to the Project. 10   Cal: 10   Acad: 9   Sumr: 1

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

CRISP Type I: A Multi-Agent Framework for Modeling and Analyzing Interdependent Infrastructures as Complex Adaptive Systems to enable Resilience Analysis and Collaborative Governance

Source of Support: NSF

Total Award Amount: $500000 (estimated)   Total Award Period Covered: 2016-2017 (estimated)

Location of Project: Florida International University, University of Illinois

Person-Months Per Year Committed to the Project. 2   Cal: 2   Acad: 1   Sumr: 1

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

BD Hubs: Midwest: SEEDCorn: Sustainable Enabling Environment for Data Collaboration
(this proposal)

Source of Support: NSF

Total Award Amount: $1,250,000   Total Award Period Covered: 9/1/15-8/31/18

Location of Project: University of Illinios Urbana-Champaign

Person-Months Per Year Committed to the Project. 0   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project.   Cal: Acad: Sumr:

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*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

Facilities, Equipment, and Other Resources

NCSA continues to support user communities by offering the resources that are the foundations of advanced cyberinfrastructure. NCSA's resources are located in two buildings on the University of Illinois' Champaign-Urbana campus. The NCSA building provides office space for most NCSA staff, advanced visualization laboratories, and 2,500 square feet of climate-controlled raised access floor machine room space for small-scale production and experimental system development. NCSA's primary production computing facility is housed in the National Petascale Compute Facility.

The National Petascale Computing Facility

The state-of-the-art 88,000-square-foot National Petascale Computing Facility (NPCF) is located at the corner of Oak Street and St. Mary's Road on the University of Illinois' south campus and houses Blue Waters and other NCSA major infrastructure, as well providing office space for NCSA and vendor staff members. NPCF began operations June 1, 2010.

The facility includes 30,000 square feet of 6' raised floor, with 20,000 square feet of contiguous, un-obstructed space for computing equipment, free of air handling equipment and support structures. NPCF combines top-flight physical and cyber protection with the open, collaborative research attitudes of a public institution. It is a highly efficient, environmentally-friendly facility and one of the very few large scale data centers to achieve LEED Gold certification. Energy efficiency is an important driver in the operation of the facility and all equipment will be as energy efficient as possible. Efficient space use is to be achieved with tall high-density equipment if possible. Full power metering and environmental monitoring are provided.

NPCF:
- Takes advantage of three on-site water economization cooling towers to provide essentially energy free cooling water about 50% of the year, depending on weather conditions.
- Takes advantage of the campus' highly reliable electrical supply providing 24 MWs of usable power with three independent feeds and a fourth feed for redundancy.
- Utilizes the campus chilled water distribution system and thermal storage facilities.
- Has a 0.5 MW UPS system for selected equipment such as metadata servers, network routers and cyber protection systems.
- Provides a 480 volt AC power distribution infrastructure to compute systems thus reducing power conversion losses. Storage and communication equipment is strongly encouraged to use 480V, but may use 120/208V if the 480V alternative does not exist
- Has multiple cooling loops. All high heat load equipment is required to be water-cooled. The Blue Waters system, for example, has all its compute, storage and server racks using state of the practice liquid cooling.
- Will operate continually at the high end of the ASHRAE standards. Equipment must be able to operate with a 60-65°F inlet water temperature and a 78°F inlet air temperature.
- Uses state of the art monitoring and control systems.

NCSA Computational and Data Resources

Blue Waters

The Blue Waters system provides unprecedented, highly productive resources and services for computational and data intensive science. It is designed for maximum throughput on very large-scale, complex applications using Cray's Gemini interconnect architecture and is a landmark petascale system with a peak speed of 13.1 PF, 1.66 PB of memory, 26 PB of user accessible on-line storage, 300 PB of usable near-line storage and 400 Gbps in external networking capability. More important than the peak speed is that Blue Waters achieves real, sustained petascale performance on multiple real science problems averaging 1.3 PF/s. Blue Waters combines into one, single, fully open system, all connected with a single, uniform, best of class interconnect fabric, the one of the world's largest general purpose computational resources, one of the largest accelerator based resources, and the most intense storage system to enable future discoveries that are simply beyond reach today. The system characteristics are summarized in the below.

- Cray XE6/XK7 system with:
  - 22,752 XE6 nodes each with 2 AMD Interlagos processors (16 FP cores) and 64 GB of RAM.
  - 4,224 XK7 nodes each with 1 AMD Interlagos processor (8 FP cores), 1 NVIDIA Kepler K20x GPU, and 32 GB of RAM.
- Cray Gemini 3D torus Interconnect with dimensions of 24x24x24 providing a peak per node injection bandwidth of 9.6 GB/s and minimum bisection bandwidth of 10.4 TB/s.
- Online storage provided by 212 Cray Sonexion Lustre appliances combining 17,280 disks for 26 PBs of usable storage out of the 35 PBs of raw space. Usable online storage bandwidth to the Cray compute engine in excess of 1.1 TB/s.
- Nearline storage provided in 4 (to be expanded to 6 in 2014) dual-arm libraries, each with 16,000 slots and an aggregate throughput of 100 GB/s. The environment currently provides usable storage up to 199 PB with an upgrade to 300 PB later in 2015 with further expansion to more than 500 raw PB limited only by media budget.
- 78 Dell servers provide high-speed file transfer via Globus Online to both online and near line storage at up to 400 Gbps to the NCSA WAN infrastructure.
- The Illinois developed Integrated System Console that collects, analyzes and takes action on millions of events per day from the system to assist in management and monitoring as well as fault detection and prediction.

iForge

iForge is NCSA's premiere and dedicated HPC resource for Private Sector Partners. iForge features two distinct hardware platforms, each configured for a different set of computational needs.

- 144 Dell Power Edge servers utilizing
  - dual Intel Haswell processors with 128 GB of RAM
  - or dual AMD Abu Dhabi processors with 256 GB of RAM.
- Interconnect: QDR InfiniBand
- 3456 cores in total
- 700 TB GPFS filesystem

ROGER – Resourcing Open Geospatial Education and Research

ROGER is NCSA's newest computational resource dedicated to research in Geographic Information Science. ROGER combines multiple computational capabilities in a modest sized system with a large, fast file system to enable data intensive work. The computational capabilities include a traditional HPC system including a portion of the nodes with GPU accelerators, a set of nodes dedicated to HADOOP and an OpenStack capability.

- 36 Dell Power Edge servers utilizing
  - dual Intel Haswell processors with 128 GB of RAM and a 500GB HD
  - 12 nodes include an NVIDIA K40 GPU
- 18 Dell Power Edge servers utilizing
  - dual Intel Haswell processors with 256 GB of RAM
  - 800 GB SSD
- Interconnect: 10 and 40 Gb Ethernet
- 1000 cores in total
- 5 PB GPFS file system

Storage Condominium

The NCSA Storage Condominium provides a reliable mid-scale data storage resource to projects that is not tied to any specific compute resource. The storage condo supports projects needing as little a TB of storage all the up to a PB and more. Multiple access methods are supported including GridFTP, NFS and native GPFS clients. The condo also offers a virtual machine capability to support various utility services for projects. The current storage condo provides about 2 PBs of total usable storage.

Ice House

The Ice House is a cold data storage service providing reliable long-term data storage for infrequently used data from a TB to many PBs. The service utilizes a Spectra Logic T950 library with space for 8,000 LTO tapes and a Spectra Logic Black Pearl provide the data transfer node and interface to users. Data is stored using the LTFS format to allow tapes to be exported and read by others. The system currently has 4.5 PBs of available storage.

High-Performance Network

All computing platforms are interconnected to a multi-10 gigabit network core. The high performance Ethernet backbone provides 1 or 10 gigabit connections as required with up to 300 gigabit external network capacity, eventually moving to 40 and/or 100 Gbps links. Currently 120 Gbps of external aggregate bandwidth is configured via 10 Gb links to multiple national networks including Internet2, XSEDE, and more via links to major research network hubs in Chicago such as MREN and OmniPOP. Upgrades to multiple 100 Gbps connections are in progress

CyberProtection

All systems at NPCF must comply with cyberprotection and operational standards to enable highly effective and efficient operations. NCSA's cyberprotection includes monitoring all exit bandwidth, deep packet inspection and tracking of network flows with state-of-the-the art tools including an 80-node Bro cluster.

Applications Software

NCSA offers a variety of third-party applications and community codes that are installed on the high-performance systems at NCSA. These applications cover a wide range of science and engineering domains, data analytics and visualization, mathematics and statistics. Some additional software available via University of Illinois campus licensing programs (e.g. Oracle, ABAQUS, ANSYS, etc.) is also available for use by University of Illinois researchers.

Unfunded Collaborations

The specific roles and commitments have been described in detail through letters of commitment. The following is a summary of these: In addition to the funded personnel at Illinois and partner sites (subawards to Iowa State, University of Michigan, Indiana University, and University of North Dakota), several unfunded collaborators from academia, industry, non-profit and government, will be available to the project in order to ensure its success. Both funded and unfunded collaborators are listed in the Project Personnel and Partner Organizations supplemental document.

Senior Personnel and Unfunded Collaborators, who are on the interim Steering Council (SC), will be actively involved in developing the governance model for the MBDH and identifying goals for the consortium. SC members are expected to serve as the initial points of contact for potential partners. They will leverage their knowledge of local industry, consortia, nonprofits, governmental agencies, and academic institutions to link existing and new partners with the Hub.

Other Senior Personnel and Unfunded Collaborators, who are not on the Steering Council, will participate in workshops, as members of the Organization Partner Board (OPB), working groups of the steering council, pilot projects, and all hands meetings.

FACILITIES & RESOURCES

Indiana University, founded in 1820, is one of the state's leading research and educational institutions. Indiana University has two main research campuses and six regional (primarily teaching) campuses. The IU Bloomington campus has 2,973 academic staff; 5,442 executive, administrative, and support staff; 10,097 graduate and professional students; and 32,367 undergraduate students. The Indiana University–Purdue University Indianapolis (IUPUI) campus is operated by Indiana University and includes schools from IU and Purdue. The IUPUI campus has 3,847 academic staff; 4,793 executive, administrative, and support staff; 8,321 graduate and professional students; and 22,245 undergraduate students. The key IU schools located at IUPUI are the IU Schools of Medicine and Nursing.

Three sets of resources at Indiana University are central to IU's contributions building, management and sustainability of the proposed Midwest Big Data Hub: Foundation, Computing, and Robust Centers.

First and foremost, foundational support for IU's participation in the Midwest BD Hub proposal exist within a few key centers on campus. The Indiana University Network Science Institute (IUNI) provides the foundation for extending research data, standardization approaches, analytic tools, and advanced training materials for Big Network Data that is the focus of Spoke 6-Network Science. The Pervasive Technology Center, encompasses expertise in computing resources, existing within the larger Research Technology Division of IU, and finally the Data to Insight Center serves an essential function in digital research, retrieval, and tool development across several science disciplines.

Second, the computing facilities at Indiana University represent a unique, state-of-the art set of resources, including technology and staff that make it possible to tackle the immense challenges of "Big Data", using a Network Science approach for innovation, scientific progress and training.

Third, the set of senior scientists that form the backbone of the proposed project have founded and/or successfully run a set of IU centers which not only provide evidence of feasibility but stand to provide additional resources to the Midwest BD Hub.

1. Foundational Resources.

The Indiana University Network Science Institute (IUNI; Pescosolido, Sporns, Saykin, Co-Directors) The ultimate goal of the IUNI is to provide a transformative scientific understanding of complex, global, interactive systems by defining the foundations of a scientific framework that shifts its focus from an object-oriented to an interaction-oriented approach. IUNI uses an IU-developed network and data science conceptual framework – the social symbiome - as the key to unlock a system level understanding across different scientific domains such as health and disease, politics, economics, and even science itself. By drawing together scientific experts in an interdisciplinary perspective, domain-specific expertise benefits from the exchange of solutions and methodologies. The Institute integrates this new scientific approach combining it with the best-established methods and novel methodological innovation in areas of excellence at Indiana University, including multi-scale computer modeling, social supercomputing, large-scale data mining and participatory platforms. Exemplary case studies and

projects not only address major scientific and societal problems such as the root of complex chronic disease, the nature and effects of information diffusion, and the optimization of scientific productivity, but also build capacity to model systems and understand network data. These studies improve our understanding of problems that transcend institutions such as resilience, trust and sustainability that are relevant to a wide range of systems. With a budget of $7 million dollars over three years (through December 2017), IUNI provides an organizational and fiscal foundation to support the aims of IU's effort in the Midwest BD Hub proposal. The IUNI budget funds resources to accomplish the proposed collaborative science on Network Science, allowing the extension to the "networks of networks" proposed in this application as well as the national dissemination of data and tools. A stable technical staff creates new data sets and builds the new tools without continual investment in training time. A capable administrative staff including an Executive Director, an Assistant Director for Business Operations, and an Assistant Director for Research Administration and Training provide project management and grants support and logistical support for organizing conferences and workshops. The IUNI infrastructure also leverages these resources for the Midwest BD Hub proposal.

The *IU Office of the Vice President for Information Technology (OVPIT)* and University Information Technology Services (UITS) are responsible for delivery of core information technology and cyberinfrastructure services and support. OVPIT and UITS collectively have a budget of more than $110,000,000 annually, employing more than 700 full-time staff members. The *Pervasive Technology Institute (PTI),* a collaborative effort of OVPIT, UITS, the IU School of Informatics, and the Maurer School of Law, is IU's flagship effort in information technology research, development, and delivery. PTI is dedicated to the development and delivery of innovative information technology to advance research, education, industry, and society. Founded by a $15 million grant from the Lilly Endowment, Inc., PTI expands the legacy university excellence in high performance computing the with research initiatives in big data tools and innovative infrastructure and biologically focused computing. Recognizing that security is both a social and a technical problem, considerable attention was paid to growing a center that had expertise in both the legal and technical challenges of security. *Plale is PTI Science Director.*

Data to Insight Center (Plale, Founding Director). The Data To Insight Center (D2I) is an informatics research center affiliated with PTI. With a staff of 25, affiliated faculty, and expenditures of $1.5M, the Center bridges Indiana University's research computing (Research Technologies), the IU Libraries, and the School of Informatics and Computing through individuals and projects that advance methodologies and infrastructure in digital data curation, data workflows, data management, data provenance, and cloud computing. Major projects and services of D2I are several: the NSF DataNet funded Sustainable Environments Actionable Data (SEAD) project provisions data curation and publishing services that embed a "trust threads" model for provenance and a matchmaker to recommend a repository for deposit. Second, the HathiTrust Research Center (HTRC) provisions a secure environment for text and image analysis on the 13.5M volumes (4.6 billion pages) of the HathiTrust digital library. Finally, the Research Data Alliance (RDA) reduces barriers to data sharing across discipline, national and international boundaries through a grass-roots organization of working group activity.   D2I contributes to US and national efforts through, among other activities, a Sloan Foundation funded Fellows program called RDA Data Share for early career engagement in RDA. D2I has extensive experience in the type of consulting and collaboration that will be essential to advancing Big Data science. It has extensive ties nationally through RDA, and is deeply

embedded in data science research and education. The Data To Insight Center releases all of its source code under an Apache 2.0 license and makes it available through a github portal.

The Indiana Clinical and Translation Sciences Institute (ICTSI; Shekhar, Director). The ICTSI seeks to increase translational health-related biomedical research by transforming the efforts of IU-based research activities to facilitate the conduct of clinical and translational science research by creating translational research acceleration programs and supporting pilot projects and by providing investigators and consumers with strategic leadership and mentorship to identify, evaluate, and support innovative and important pilot research at each step of the translational cycle. The Indiana CTSI builds facile and comprehensive research resources and technologies by transforming the existing and new research infrastructure into innovative programs. Toward this end, the Indiana CTSI provides support for Project Development Teams PDTs) designed to be incubators for research. The IUB-based Networks, Complex Systems & Health PDT (chaired by Pescosolido) described below, brings together IU researchers who utilize a network and/or complex systems approach to understanding and improving health, illness or disease, health care and medicine. Any type of network phenomenon or influence (e.g., social networks, virtual networks, organizational networks, protein networks) or any system perspective (e.g., systems biology, social systems) are considered by the multidisciplinary team that reviews seed proposals, mentors researchers, and/or discusses research ideas relevant to the translational mission of the Indiana CTSI.

2. <u>Computing Resources at Indiana University</u>

The *Indiana University* Bloomington Data Center (http://it.iu.edu/datacenter/) provides a highly secure and green environment for IU's largest computational and storage systems. The facility is secured with card-key access, biometric authentication, and 7 x 24 x 365 video surveillance. Only staff with systems or network administration privileges have access to the machine room. Fire suppression is provided by a double interlock system accompanied by a Very Early Smoke Detection Apparatus (VESDA). Three circuits feed the new Data Center, travelling redundant physical paths from two different substations. Any two circuits can fully power the building.

	Machine room total ft^2	Avail. ft^2	Power total	Net power avail.	Cooling capacity total (tons)	Cooling capacity avail. (tons)
IUB Data Center	30,000	15,000	1.46 MW	317 kW	2200	550

2.a. Overall structure and support of IU's advanced research cyberinfrastructure

IU Pervasive Technology Institute (PTI) staff support all users of IU's research cyberinfrastructure – local, national, and international – as part of their ongoing operational responsibilities, including support for high performance computing systems, data storage systems, and visualization systems. Online support is provided on a 7 x 24 basis with IU's award winning Knowledge Base Support for security needs and emergency situations is provided by telephone on a 7 x 24 basis via staff at the IU GlobalNOC. In depth support is available via email, telephone, and in person meetings.

Production Computer and HPC systems

The following production computing system resources at IU are available for utilization in this project:

> **Intelligent Infrastructure Service (IIS)** is supported by IU, and provides at a nominal cost for hosting Virtual Machine services for experimentation and production use.

> **Big Red II.** A Cray XE6/XK6 installed May 2013 that consists of 1020 nodes total: 344 XE6 nodes, each with two 2.5 GHz AMD Abu Dhabi processors and 64 GB of memory; and 676 XK6 nodes, each with one 2.3 GHz AMD Interlagos processor and one NVIDIA K20 accelerator with 32 GB of system memory and 5 GB of GPU memory. The nodes are interconnected in a 3D Torus using Cray's Gemini interconnect that provides 20 GB/s of bandwidth per node. This system will have more bandwidth to high performance file systems such as the Data Capacitor than ever before, as they will connect via a low-latency InfiniBand network that will provide an aggregate throughput to storage of 48 GB/s.

Name	Architecture	TFLOPS	RAM (TB)	Local disk (TB)
Big Red II	Cray XE6/XK6 (AMD x86-64 and NVIDIA K20)	1000.37	47	180

Data storage and archival systems

IU's Scholarly Data Archive (SDA) is available for parking large data products resulting from this project. Data stored within the IU Scholarly Data Archive are stored in duplicate copies – one in the tape silo located at IU Bloomington, one in the tape silo located at IUPUI in Indianapolis. The HPSS metadata specifying which tapes contain any given file is backed up continuously, with multiple copies existing both in Indianapolis and Bloomington.

Networking

The primary connection between IU and national research networks is a 100 Gbps network link from Internet2 to the Indiana GigaPOP in Indianapolis. The Indiana GigaPOP is a collaborative facility located in Indianapolis and operated by the IU GlobalNOC on behalf of the collaborating partners: Ball State University, Indiana University, Purdue University, and University of Notre Dame. IU was the first site to connect to Internet2 at 100 Gbps as part of the Monon100 project. In January 2013 IU's 100 Gbps connection will be extended from Indianapolis to the main campus in Bloomington. The Indiana GigaPOP has a 10 Gbps dedicated connection to the CIC OmniPOP that may be upgraded to 100 Gbps 2013. For redundancy, the GigaPOP also maintains four 10 Gbps redundant and physically isolated connections to commodity Internet. The IU Research Network has as its backbone the 100 Gbps link from the GigaPOP to the IUPUI campus in the Informatics and Communications Technology Complex building and from there to Bloomington and the IUB Data Center.

Visualization

PTI maintains and operates a number of advanced visualization resources, including but not limited to ultra-high resolution displays, virtual reality environments, 3D cameras, scanners, spatial input systems, and haptic feedback devices.

- *Virtual Reality Theater.* The Virtual Reality Theater is a bright, high-resolution immersive virtual reality technology suitable for individual and group use. The Theater is reconfigurable and driven by workstation computers running either Windows or Linux.

- *Visualization & Collaboration Theater.* This three-screen, front projected display offers either stereoscopic or monoscopic high-definition visualization and presentation capabilities for up to 60 people.

- *IQ-Station.* The IQ-Station is a low-cost stereoscopic display with optional user interface components including touchscreens and/or input device tracking. A fully equipped Station is most suitable for scientific research groups while simplified versions are excellent for stereoscopic screening and production as well as conferences and outreach events.

- *Ultra-High Resolution Display Wall.* Built using eight high-resolution projection cubes totaling 15.3 million pixels, the Display Wall is capable of receiving input from multiple sources simultaneously, making it ideal for teleconferencing, group collaborations, and/or multiple highly advanced visualization applications. Similar to the IQ-Wall described below, it is driven by a single computer.

- *IQ-Wall.* The IQ-Wall is an AVL design that tiles thin, energy efficient flat-screen monitors into configurations that meet the requirements of the users and the space. These Walls are driven by a single Windows computer. The AVL has integrated several IQ-Walls, but the premier unit is located in the lobby of the CIB on IU's Bloomington campus and features 24 tiles and nearly 50 million pixels.

- *IQ-Tilt.* The IQ-Tilt features four monitors tiled together in a 2x2 configuration. This nearly 100" display is treated as one Windows desktop driven by a single computer, and is multi-touch enabled. Its name comes from the fact that this display pivots on an axis and can be reconfigured in less than ten minutes into either horizontal table or a vertical wall positions.

- *IQ-Table.* A 55" monitor equipped with 32-point multi-touch capabilities, the IQ-Table is ideal for building lobbies, libraries, or off-site exhibits. Its built-in computer and shipping case make it easy to ship, set up, and tear down.

- *IQ-Force.* The IQ-Force is an open design created in 2011. It features a tabletop device that combines stereographic rendering with physical force and tactile feedback. Allowing the user to see their real hand in the same physical vicinity as the virtual simulation provides a more natural sense of scale, orientation, and augmentation.

- *Small Object & Facial 3D Scanning.* AVL staff maintain knowledge and working techniques broadly related to surface and environment scanning. The AVL has multiple devices for capturing the 3D surface models of items approximately one cubic foot in size and is able to work with collaborators to rent or use additional equipment if necessary.

- *Stereoscopic Video Camera Rigs.* The AVL has two stereoscopic video camera rigs for filming live-action stereoscopic video sequences. One rig is a lower quality, smaller form factor for easy portability; the other is a high-end, professional set-up for more authentic productions. Video captured with either rig can be edited using software available to all IU students, faculty, and staff.

- *Ultra-High Resolution Photography.* A Gigapan robot can be used to automatically capture multiple 2D photographs of a scene or environment, which can then be composited together to form a very large, high-resolution image. Users can view and interact with the final panoramic image via standard web browsers running an additional plug-in.

Federal systems security policy and federal funding agency policy compliance. IU high-performance computing and storage systems described here are managed and administered in ways that meet National Institute of Standards and Technology (NIST) 800 security standards. OVPIT and UITS comply with the NIH Grants Policy Statement.

See Figure 1 on the next page.
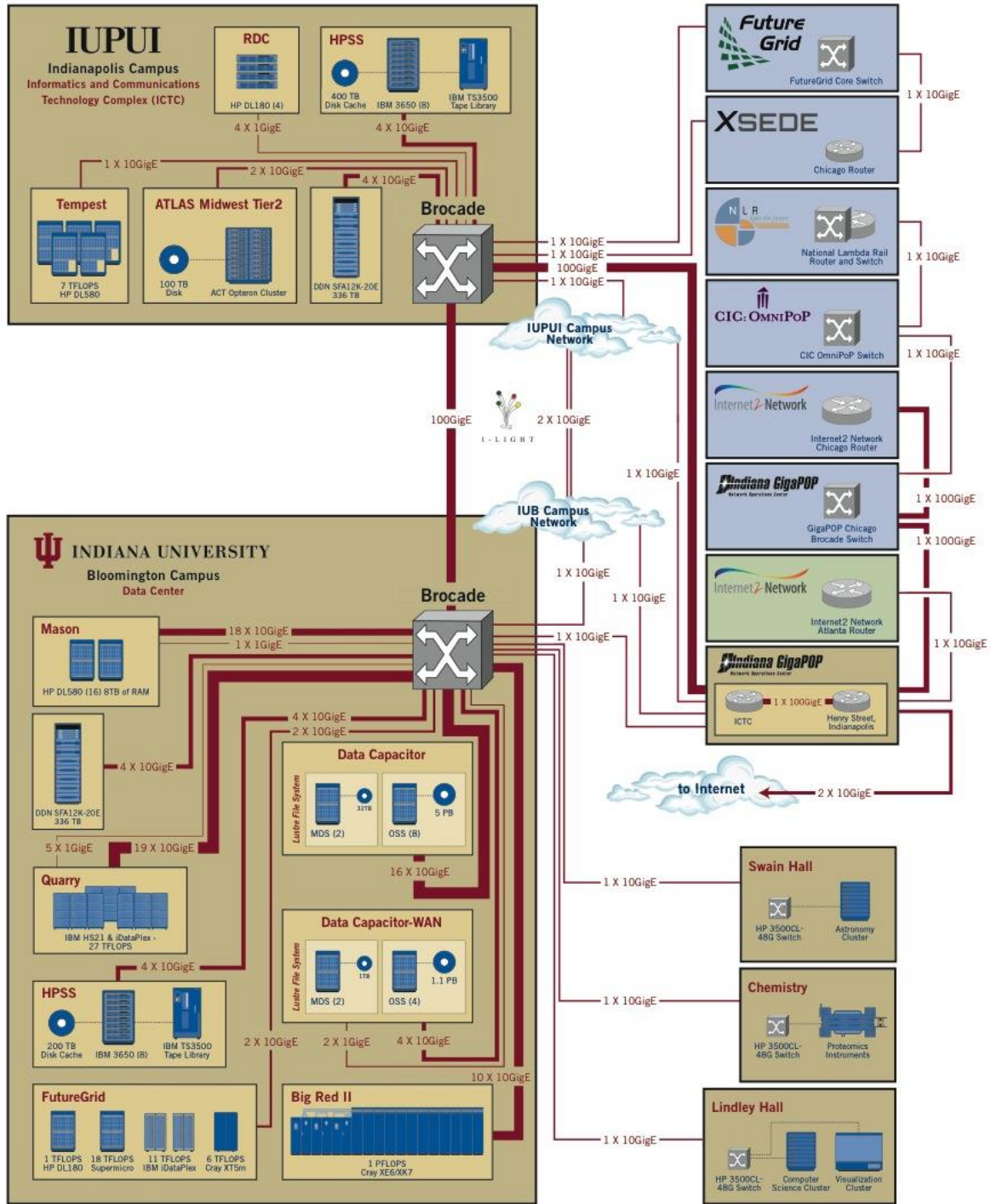
Figure 1. Schematic diagram of IU cyberinfrastructure showing network connections between IU and other national networks and network connections and cyberinfrastructure within IU.

3. Additional relevant senior scientist and Center/Institute activity at Indiana University

3.a. Scientist Expertise

Beth Plale, PI, is on partial academic release, only obligated to teach one on-line class for one semester each year. She is able to provide substantive start up effort to the Midwest Big Data Hub (MBD Hub) effort due to this reduced academic commitment. Professor Plale will provide overall direction to the proposals effort within the IU community and provide expertise as Lead 2 on two Rings within the Midwest Big Data Hub: Tools and Services and Data Sciences. Dr. Plale's effort will not conflict with other approved NSF awarded salary support. **

Bernice Pescosolido will serve as a co-PI and will add a distinctive dimension to the leadership within the MBD Hub with her leadership role in the IU Network Science Institute (IUNI). Professor Pescosolido will lead the effort in bringing big data analysis forward through development of a network science analytic and explanatory perspective to provide analytic tools, workshops and education relevant to interconnected Big Data. She will serve as the lead on Spoke 6 of the Midwest Big Data Hub for Network Science.

Olaf Sporns will serve as Senior Personnel. As Co-Director of the IU Network Science Institute (IUNI), he will assist co-PI Pescosolido in identifying and leveraging IUNI resources to facilitate the activities of Spoke 6 – Network Science and Spoke 2 -- Health Sciences, Life Sciences, Bioinformatics, Genomics, as well as the Education & Training component.

Fred Cate will serve as Senior Personnel. As Director of the Center for Law, Ethics and Applied Research in Health Information and Founding Director, Center for Applied Cybersecurity Research, he will direct his effort to supporting Spoke 6 – Network Science. In particular he will assist in developing and providing workshops and other instructional materials on issues of cybersecurity and data ethics.

Eric Meslin will serve as Senior Personnel. As Associate Dean for Bioethics, IU School of Medicine, and Director for the Bioethics and Subject Advocacy Program, Indiana Clinical and Translational Science Institute, Professor Meslin will bring expertise in data privacy and ethics to the project. He will also work with the IUNI leadership to develop training materials on issues of ethics to facilitate the activities of Spoke 6 – Network Science and Spoke 2 - Health Sciences, Life Sciences, Bioinformatics, Genomics, as well as the Education & Training component.

Robert McDonald will serve as Senior Personnel. As Deputy Director of the Data to Insight Center and as Associate Dean for Library Technologies, McDonald will contribute expertise in technological Infrastructure and Innovations that facilitate and enhance digital resources that can be enhanced through large-scale data access. Robert H. McDonald. Robert will serve as a liaison to regional commercial partners within the state of Indiana as well as a partner in building awareness and participation of the BDHUB among regional institutional repository programs. Additionally, McDonald will work to enable data publishing via the data storage resources contributed from Indiana University that include the IU ScholarWorks repository, DC-WAN, SDA, and RFS.

Robert Quick, High Throughput Computing Manager within Research Technologies and Operations Officer of the Open Science Grid will bring research compute technology expertise to the project. Robert brings a history providing compute resources for national and international projects including the ATLAS and CMS detectors at CERN, the Intensity Frontier experiments at Fermi National Accelerator Laboratory, the Laser Interferometer Gravitational

Wave Observatory (LIGO), as well as with local projects at Indiana University with Bioinformatics and Medical projects including the Structural Protein Ligand Interactome (SPLInter) project and the National Center for Genomic Analysis Support (NCGAS) galaxy portal. Quick will coordinate the use of the tools and services contributed by the IU campus cyberinfrastructure management team to the Big Hub efforts.

Andrew Saykin will serve as Senior Personnel. As Director of the Indiana Alzheimer Disease Center and of the Indiana University Center for Neuroimaging, Dr. Saykin leads a sponsored research program which focuses on the use of brain imaging and genomic methods, including examining genomic correlates of brain imaging phenotypic markers. Dr. Saykin will bring his expertise and the synergistic resources of these two centers to advancing the objectives of Spoke 2 - Health Sciences, Life Sciences, Bioinformatics, Genomics. He will also contribute to Spoke 6-Network Science activities through his leadership role in the Indiana University Network Science Institute.

** NSF awarded budget support for Dr. Plale's current NSF projects is 22 weeks, pending is an additional 2 weeks. A substantial portion of that allocation is academic year support. One project will expire in 2016.   Of particular note is the academic support for Professor Plale for 12 weeks academic pay for her leadership role in Research Data Alliance. For that NSF supported collaborative research funded through RPI, Plale serves on the International Board, USA Executive Committee, and USA Advisory Board.

3.b. Center/Institute Frameworks

Center for Applied Cybersecurity Research (Cate, Director)*.* The Center for Applied Cybersecurity Research (CACR) (www.cacr.iu.edu) was founded in 2003 by IU President (then-Vice President and CIO) Michael McRobbie to improve the quality of information assurance through research, public and professional outreach, and collaboration with practitioners and policymakers. It is unique among cybersecurity research centers in its combination of deep technical expertise with a highly interdisciplinary focus on law, policy, economics, and behavioral sciences, and in its emphasis on applied, real-world cybersecurity challenges. CACR is recognized as a National Center of Academic Excellence in both Information Assurance Education and Information Assurance Research, and it operates the REN-ISAC, the information sharing and analysis center for higher education and major research networks and one of the 16 industry-specific ISACs recognized by the Department of Homeland Security.

CACR has extensive experience in the type of consulting and collaboration that will be essential to advancing Big Data science in the context of biomedical research. It already leads an NSF-funded effort to enhance the cybersecurity for major NSF-funded projects, and works closely with government, industry, and academia on a wide range of collaborative projects, including an initiative on risk assessment and management in Big Data. In addition to its expertise, CACR will be contributing its administrative and professional staff to this initiative.

Center for Biomedical Informatics (Schleyer, Director). The Center for Biomedical Informatics (CBMI) is a global collaborative research and learning organization, developing and evaluating innovative informatics solutions to improve patient care and translate these solutions into cost-effective, operational systems, including a dynamic electronic medical record system. The Center for Biomedical Informatics has developed and advanced one of the nation's first electronic medical record systems, one of the country's first computerized provider order entry (CPOE) systems, and a health information exchange which has made Indiana the most health-wired state in the country and a national model for health data exchange. These applications

and tools are widely recognized for their roles in improving quality of care, efficiency of healthcare delivery, reducing medical errors and enhancing patient safety. In April 2006, Rand Corporation report identified Regenstrief Institute Medical Informatics as an internationally recognized healthcare information pioneer, one of four benchmark institutions that collectively were the source of nearly 25% of all published, high-quality, evidence-based research on the impact of information technology on the quality of health.

Center for Law, Ethics, and Applied Research in Health Information (Cate, Director). In 2010, following a conference on Establishing a Research Agenda for Privacy and Security of Healthcare Technologies, the Center for Applied Cybersecurity Research (CACR) created the Center for Law, Ethics, and Applied Research in Health Information (CLEAR) in partnership with the Maurer School of Law, the School of Medicine, the School of Informatics, and the Vice President for Information Technology. CLEAR addresses the ethical, policy and user issues necessary for enhancing the use of health information in treatment and research through research into current legal and other impediments to that use; practical demonstration projects of how personal information can be used more effectively to improve health and quality of life; proposals for specific regulatory change necessary to facilitate the responsible use of health data; consensus-building among key constituencies in industry, patient groups, academia, philanthropy, and government; and educational efforts targeting patients, the public, press, and policy makers.

CLEAR is both interdisciplinary and collaborative, working with key stakeholders in in all of its projects. With offices and advanced video conferencing facilities on both the Bloomington and Indianapolis campuses, CLEAR is actively involved in advancing Big Data science in the context of biomedical research, supports the OECD Panel of Experts on Health Information Infrastructure, and will facilitate the current initiative through its expertise in legal, ethical, and user issues in health information; through administrative and professional staff support; and through interaction with its Stakeholder Group (which includes representatives from Acxiom, Amgen, the Data Protection Commissioner of British Columbia, the Center for Democracy and Technology, C-Change, CVS/Caremark, GE, Intel, Iowa Health Systems, Lilly, McAfee, Merck, Microsoft, No More Clipboard, Oracle, and Proteus, in addition to academic researchers).

Center for Neuroimaging (Saykin, Director). This Center utilizes advanced imaging technologies to further the understanding of brain structure & function through the study of healthy individuals, clinical populations, and translational animal models. This is by investigating the influence of genetic variation on imaging phenotypes including brain structure and function in health and illness as well as treatment response. It also provides training and experience in structural, functional and molecular neuroimaging research, and, develops, assesses, and validates emerging technologies. The Center optimizes the use of existing molecular and functional imaging methodologies including PET, fMRI, DTI, MRS, perfusion and morphometric imaging as well as optimize the use of existing molecular and functional imaging methodologies including PET, fMRI, DTI, MRS, perfusion and morphometric imaging. The fundamental goals od to advance the state of the art in clinical care for brain disorders including neurosurgical planning and image-guided therapy.

Center for Research on Learning and Technology (Hmelo-Silver, Director). This Center brings faculty together with a research focus on the linkage between learning theory, pedagogy, and technology. The CRLT makes available various technology and administrative resources to support the research of its members. IU and the Instructional Systems Technology department in the School of Education support technology-enhanced instruction, and have a rich selection of technological resources available for projects that are managed through the CRLT. Currently

the Center supports sixteen research projects and a total of 35 on-site staff. The Center is jused in a suite of 42 offices for project personnel, faculty, research associates, graduate assistants, professional and hourly staff, and undergraduate students. Each office workstation is equipped with a PC or laptop, and the office suite is networked for wireless service. The space has three meeting/conference rooms with digital projectors, white boards, DVD/VCRs, and guest computers with wireless capability, as well as an interactive white board. On-site administrative personnel provide support in the areas of grants administration, supply purchasing, travel assistance, and day-to-day technical and clerical service.

Cyberstructure for Network Science Center (CNS) (Börner, Founding Director). This Center provides a cyberinfrastructure for the analysis, modeling and visualization of social, behavioral, biomedical and physical networks in support of research and education in diverse departments at IU. The Center also houses the Information Visualization Laboratory (InfoVis), also directed by Boerner. The CNS Center was founded in October 2005. The Center's mission is to advance datasets and tools for the study of biomedical, social and behavioral science, physics, and other networks. A specific focus is research on the structure and evolution of science and technology (S&T) and the communication of results via science. The Center co-organizes international workshops and conferences, promotes network science and visualization at national and international initiatives, organizes and finances a weekly talk series on Networks and Complex Systems and annual Open Houses, hosts about 10 national and international visitors/faculty each year, and teaches regular workshops on the infrastructures and tools it develops and supports. The Center has its administrative home in the School of Informatics and Computing. Physically, it occupies seven offices and part of a server room in the Wells Library.

Indiana Alzheimer Disease Center (Saykin, Director). The mission of the Indiana Alzheimer Disease Center is to serve as a shared research resource in order to facilitate research in Alzheimer disease and related disorders and to distinguish them from normal aging. Within this mission, one objective is to provide an environment and core resources to enhance ongoing research and foster new lines by bringing together basic and clinical scientists to study the etiology, pathogenesis, diagnosis, and treatment of Alzheimer disease and related dementias, with an emphasis on hereditary dementias. Another objective is to provide an environment for fellows and junior faculty to acquire research skills and experience in interdisciplinary research and thereby promote their interest in the area of Alzheimer disease research.

Indiana Consortium for Mental Health Services Research (Pescosolido, Founding Director). ICHMSR is an established inter-disciplinary program bringing together academic researchers from universities across the country with government leaders, consumers, and advocates, to discuss and study the interface of the community and the treatment system networks. Funded originally by a Research Infrastructure Support Program (R24) from the NIMH, ICMHSR currently is supported by research grants and the College of Arts and Sciences at IU. ICMHSR projects currently include the Stigma in Global Context – Mental Health Study (SGC-MHS), the first global, theoretically and methodology coordinated study of the pubic stigma of mental illness, funded by the NIMH, The Fogarty International Center and OBSSR. In addition, an NIMH funded project investigates the individual and contextual level interaction of social and biological factors affecting suicide in the United States. It is located in the Schuessler Institute of Social Research on the Bloomington campus.

Indiana University Center for Bioethics (Meslin, Founding Director). The IUCB was established on the campus of Indiana University-Purdue University at Indianapolis (IUPUI) in July 2001 with a broad mandate to conduct research, engage in education, and provide service

to the Indiana University community. The IUCB is a university-wide Center, with multidisciplinary involvement from many schools and programs on the Indianapolis campus and the Bloomington campus. The IUCB is located in the Health Information and Translational Sciences (HITS) building on the campus of Indiana University-Purdue University Indianapolis (IUPUI) with more than 2000 sq of collaboration space, with ample office space for faculty and visitors including workstation PCs, wireless network access, printers, copiers, and facsimile machines. IUCB houses several conference rooms and a cutting-edge video conference system that enables face-to-face collaboration with all members of the study team. These physical resources will be fully available to collaborators in the BD2K-NS, provided in-kind.

INSIEME (Pescosolido, Founding Director). INSIEME, from the Italian word for "together," provides an overarching structure and set of resources to communicate shared interests among the network and complex systems research scientists in the College of Arts and Sciences (COAS). It provides leadership and resources to encourage and support translational research examining networks/complex systems, positioning their influence across a wide array of health and health care research problems. In addition, INSIEME is designed to improve the coordination of existing network-themed centers under an umbrella organization by encouraging a focus on health and health care; building collaborations within and across the IU campuses, and providing administrative support for the development, design and production of research.

Facilities, Equipment, and other Resources – Iowa State University

Sarah Nusser (Vice President for Research) and Wolfgang Kliemann (Associate Vice President for Research) will coordinate the Iowa State activities of the Midwest Big Data Hub. This includes collaboration with industry, organization of research groups, workshops and seminars, and coordination with other institutions participating in the program.

Computer: Cyber Infrastructure to support activities of the Midwest Big Data Hub:
Iowa State University has a world-class research cyberinfrastructure to support innovation and discovery. University support, including central and local resources, cover a broad spectrum of services from advanced technologies to software tools to IT support staff.   A few highlights follow.

NETWORK: The campus network provides abundant wired and wireless capacity to support research activities of all types. The backbone network operates at 100 gigabits, providing gigabit or better service to campus buildings. Connectivity to the Internet2 national research and education network is provided regionally by the BOREAS network, which is co-owned and co-operated by Iowa State University and our partner research universities.   BOREAS (Broadband Optical Research, Education, and Science network) forms a fiber optic ring around the upper Midwest connecting Iowa State to international network hubs in Chicago and Kansas City with 100 gigabit waves.   While there is ample commodity Internet service available on campus, BOREAS allows Iowa State to provision specialized high capacity network circuits between campus research facilities and collaborators at national laboratories, universities, and corporations around the world.

HPC: Terascale supercomputers are available for research and education purposes.   Centrally managed high performance computing systems represent in excess of 8,000 compute cores and petascale storage, primarily in three large clusters. The CYEnce cluster has 4768 Intel SandyBridge cores with 8 Gbytes/core , 48 Intel Phis, 48 Nvidia K20s, 40Gbit (QDR) Infiniband, IPoIB for all nodes; three 10Gbit connections to campus about ¾ Petabyte NFS, plus ¾ Petabyte for backup, ¼ Petabyte Lustre; 1 ¼ Pbyte RAID -1 local storage on nodes. A recently acquired community cluster similar to CYEnce will be available spring 2015.   HPC services include support for commonly used code development and computational tools, such as Hadoop. Campus workshops on cluster computing are offered by the HPC team. Graduate courses in high performance computing are jointly offered by several academic departments.   Detailed information about available clusters can be found at www.hpc.iastate.edu.

STORAGE: In addition to the data storage options provided by HPC efforts, research faculty and staff have several choices for storing daily work and large data sets. These include acquiring space in the centrally supported campus storage cloud or leveraging commercial cloud storage providers whose services are integrated into the ISU cyberinfrastructure fabric.

IDENTITY: Seamless integration of campus and cloud services is facilitated by federated identity management, such as Shibboleth-enabled services. Federation also supports sharing systems and data between research collaborators working at a distance.

SECURITY: Iowa State's central IT information security team consults with campus researchers on deploying best practice strategies to protect research data. The security team is experienced with addressing FISMA security requirements requested by federal agencies.

VISUALIZATION: Iowa State University has a one of a kind virtual reality facility to help researchers analyze data through visualization.   At the core is the C6 room (10'x10'x10') in which all six surfaces are illuminated from the outside by ultra-high resolution stereoscopic interactive computer graphics. The

VRAC research community spans a wide spectrum of disciplinary experts with particular strengths in state-of-the-art interaction technologies including virtual, augmented and mixed reality (VR/AR/MR) as well as mobile computing, developmental robotics, and haptics interaction. A friendly, efficient, service-oriented staff supports the collaborative interdisciplinary culture at VRAC. Administrative support facilitates research proposal preparation and submission, grant administration, purchasing and student appointments, while technical staff provides hardware maintenance, system integration, vendor coordination and technical assistance to the research community.

Office:

Office facilities and resources are available in the area of the Vice President for Research, Beardshear Hall on the Iowa State campus. All office space is equipped with high-speed Internet connections, personal computers, printers, desks, chairs and other common equipment.

Other:

MEETINGS: Space for meetings is available in Beardshear Hall, the building of the central administration of Iowa State University that houses the offices of the Vice President for Research. All meeting space is equipped for video conferencing, including recording and projection devices.

LIBRARY: The University Library provides a wide array of print, non-print, and electronic information resources, which are available in the main Parks Library, the e-Library, the Veterinary Medical Library, and three subject-oriented reading rooms (design, mathematics, and physical sciences). The library's extensive collections support research and study for all ISU undergraduate and graduate programs, with the strongest support at the Ph.D. level. These collections are nationally recognized for their strengths in basic and applied fields of biological and physical sciences. Library holdings include more than 2,380,000 volumes and over 28,000 serial subscriptions.

The library encourages use of its collections and many services, and assistance is provided at eight public service desks. These desks include the Reference Desk, Reserve and Media Services, Interlibrary Loan/Document Delivery, the Circulation Desk, the Periodical and Newspaper Room, the Microforms Center, Special Collections, and the Map Room. In addition, instruction in the use of library resources is offered to graduate and undergraduate students.

The library's e-Library, accessed through the Internet, provides access to the local online catalog; indexing and abstracting databases; electronic journals and books; and selected Internet sites. Assistance in using this vast body of electronic resources is available at the Reference Desk and through individually arranged appointments with reference librarians.

The Parks Library has a limited number of semi-private study rooms available for faculty, graduate students and professional and scientific staff. They are intended for research and other scholarly activities that require extensive use of library material. Normally, assignments are made for a semester at a time. Iowa State University provides full access to all faculty, students and staff to an extensive array of electronic bibliographic resources, reference materials and databases.

UNFUNDED SENIOR PERSONNEL: Dr. Sarah Nusser will be part of the Executive Team, and will be a member of the Midwest Big Data Hub Steering Council. Dr. Sarah Nusser will be responsible for ensuring Iowa State University's active participation in MBDH leadership responsibilities, and the development and implementation of programs and activities that foster partnerships in support of big data innovation.

Facilities, Equipment, and other Resources – University of Michigan

Brian Athey (Co-Director, Michigan Institute for Data Science (MIDAS, effective July 1, 2015) will oversee the University of Michigan activities of the Midwest Big Data Hub. This includes collaboration with industry, organization of research groups, workshops and seminars, and coordination with other institutions participating in the program.

The University of Michigan has a world-class research cyberinfrastructure to support innovation and discovery. University support, including central and local resources, cover a broad spectrum of services from advanced technologies to software tools to IT support staff. These resources include

Advanced Research Computing:
Advanced Research Computing at U-M (ARC) provides computing hardware and software for researchers across campus, and supports services and educational opportunities for the research community. ARC brings researchers and advanced computing resources together through a shared computing cluster (Flux, 19,000+ cores and growing), events (symposia, speaker series, and education and training sessions) for individuals engaged in computational discovery at U-M, and access to regional and national high-performance computing resources, as well as on-campus infrastructure. Computing sites are connected by a campus network backbone consisting of a mixture of Gigabit, and increasingly, 10-Gigabit Ethernet. The campus network is connected to the Internet and Internet2. University of Michigan researchers participate in several computing consortiums such as the tranSMART Foundation, ICPSR (Interuniversity Consortium for Political and Social Research), NSF-funded Blue Waters petascale supercomputer project, TeraGrid, XSEDE, nanoHUB, and other research computing initiatives.

Meeting / Conference Facilities:
Located at the junction of the Central and Medical campuses, Palmer Commons offers U-M faculty, staff, and students and Ann Arbor community members a place to make connections for seminars, lectures, meetings, and events. Palmer Commons offers flexible conference and meeting space, accommodating up to 274 people. The conference areas are on the fourth through sixth floors of the building. The fourth and fifth floors contain the 140-seat Forum Hall auditorium, a 1400 sq. ft. atrium ideal for receptions and poster sessions, and the 3200-square-foot Great Lakes Room, a divisible multipurpose room used for many different functions, including research conferences and workshops.

Office:
Office facilities and resources will be available in the Michigan Institute for Data Science located in the SPH1 Building on the University of Michigan Ann Arbor campus. All office space is equipped with high-speed Internet connections, personal computers, printers, desks, chairs and other common equipment. Additionally, University of Michigan personnel participating in the MBDH and *SEEDCorn* project have access to similar resources in their home units in the Medical School, College of Engineering, Business School and School of Nursing.

Unfunded Senior Personnel: Dr. Brian Athey will be part of the Executive Team, and will be a member of the Midwest Big Data Hub Steering Council. Dr. Athey will be responsible for ensuring the University of Michigan's active participation in MBDH leadership responsibilities, and the development and implementation of programs and activities that foster partnerships in support of big data innovation. Drs. Ivo Dinov, HV "Jag" Jagadish and Jun Li as well as Mr. Kevin Smith will also participate in MBDH activities. Their specific contributions will focus on

data science education and training, industry outreach, regional and national collaboration as well as potential spoke activates focused on transportation, health, advanced manufacturing, smart cities and business analytics. These specific activities align with their leadership roles in the Michigan Institute for Data Science (MIDAS) at the University of Michigan.

University of North Dakota
Facilities, Equipment, and Other Resources

The following University of North Dakota (UND) and North Dakota University System (NDUS) resources are available for use by the SEEDCorn Big Data Hub project for the activities related to Midwest Big Data Hub governance, education, and outreach programs.

<u>Unfunded Personnel</u> – Dr. Joshua Riedy, SEEDCorn Co-PI, joined the UND academic affairs office as the university's first vice provost and chief strategy officer where he is responsible for implementing institutional use of strategic intelligence, functions as the university's chief information officer, and provides leadership and management to units within academic affairs. In his role as UND CSO/CIO, Dr. Riedy has served on committees that establish or maintain successful multi-institutional partnerships including the Grand Sky UAS Park, Northern Tier Network Consortium, and the Northern Plains UAS Authority. He was instrumental in guiding the plan to establish a *Collaborative Center for Computation and Data* to unanimous approval by the ND SBHE, and facilitated the collaborative research relationship between the UND Computational Research Center (CRC) and Data Vortex Technologies. Dr. Riedy lead the effort to procure the funding and legislative support for the construction of state-of-the-art IT facilities including an office building and the new Tier 3 Data Center on behalf of NDUS and UND.

<u>ACI-REF and XSEDE Region 3 Campus Champion</u> – CRC High Performance Computing (HPC) Specialist, Aaron Bergstrom, works with UND faculty and student researchers to deploy scientific computing applications on CRC HPC systems. The specialist not only serves as the UND Campus Champion (CC) to the national eXtreme Science and Engineering Discovery Environment (XSEDE) organization, but also serves as the XSEDE Region 3 (Midwest – ND, SD, MN, IA, WI, & IL) Campus Champion as well. As the Region 3 champion, Mr. Bergstrom hold the responsibility for determining the location of the annual Region 3 champions meeting. Additionally, Mr. Bergstrom regularly attends conferences and workshops in the areas of Cyberinfrastructure and High Performance Computing, including the Virtual Residency Workshop for Advanced Cyberinfrastructure Research and Education Facilitator (ACI-REF) hosted at OU Supercomputing Center for Education & Research (OSCER). In these roles, Mr. Bergstrom not only assists university researchers in obtaining allocations on XSEDE HPC resources, but serves as a regional facilitator for conversations regarding matters of Cyberinfrastructure.

<u>Scientific Computing PhD Program</u> – UND offers graduate study leading to the Doctor of Philosophy in Scientific Computing – emphasizing the development of software, the science, and the technology required to support computational science and simulation based science and engineering. Students of this program are required to participate in interdisciplinary graduate training, and are encouraged to work on interdisciplinary Big Data and HPC research projects using CRC systems. The UND Dept. of Computer Science (CS) maintains an HPC sandbox in support of the program's coursework.

<u>NDUS Core Technology Services (CTS)</u> provides network services to thousands of customers and all locations on the UND main campus and at remote locations and campuses in the North Dakota University System. These services connect individuals and units through Internet1 and Internet2, and are received via STAGEnet and NTN. 10 Gigabits per second (Gbps) network connections are provided from the UND campus core to the NDUS Data Center/UND CRC.

UND Computational Research Center – The UND Division of Research and Economic Development maintains the CRC through a Service Level Agreement with NDUS CTS. The purpose of the center is to provide UND faculty and student researchers with access to general scientific computing resources. The CRC maintains a general-use 40+ teraflop High Performance Computing (HPC) cluster, a GIT code repository, Globus Online access node, Sage2 collaboration server, Sage2 visualization room, and a BOINC middleware infrastructure for the Citizen Science Grid (csgrid.org) volunteer computing project.

NDUS Advanced Learning Technologies (NDUS ALT) provides UND with its videoconferencing services and works with NDUS institutions to deliver system-wide applications for learning management systems; lecture capture technologies; Intranet technologies; and video conferencing, audio conferencing and web conferencing solutions. NDUS ALT provides consulting and technical support related to enterprise endpoint management for videoconferencing endpoint technologies. As part of these offerings NDUS ATL manages the North Dakota Interactive Video Network (IVN), which provides state-of-the-art videoconferencing services to UND students, faculty, staff and state residents. IVN services link academic classes and meetings with the UND community, connecting users to the information and educational resources they need to accomplish their goals. IVN services include:

- Access to multipoint bridge for videoconferences, audio conference or a combination of the two
- Web based scheduling software — including training and support for scheduling software users
- Troubleshooting and help desk support for audio and video conferences
- Troubleshooting and support for all certified and registered videoconferencing endpoints in North Dakota University system sites, NDSU Extension, and the tribal colleges
- Support of connectivity with off-network video endpoints
- Training and support for instructors and staff

Federated Identity Management – Most UND computer systems, including those run by the CRC, authenticate users with credentials provided and managed by an Identity Management system. As every faculty, staff member, and student at every NDUS campus has such credentials, this allows for easy and secure management of users. While being a relatively easy authentication system to manage, it does not address the issue of access for UND persons that require access at institutions outside of the NDUS infrastructure, nor does it provide NDUS access to out-system users. To address these issues NDUS has begun the process to join national federated identity management systems such as EduRoam (will be completed before September 2015) and InCommon (at Silver level certification – working toward).

The NDUS Data Center is located on the UND campus, and has been built to criteria of a Tier 3 data center as defined by the Uptime Institute.[3] Data center features include 5000sqft (currently 3,000 sqft built out with power, cooling and racking) of machine room space, redundant power and cooling systems, as well as dual fiber networks connecting the data center to the UND campus network, Internet1, and Internet2 through the North Dakota Statewide Technology Access for Government and Education network (STAGEnet) and the Northern Tier Network Consortium's (NTN) regional research network. The data center network is designed with up-to-date routing and switching, next generation security appliances, and application delivery solutions. Network connectivity, security, and management is provided in a highly redundant configuration for secure and reliable service delivery.

BD Hubs: MIDWEST: SEEDCorn: Sustainable Enabling Environment for Data Collaboration – Data Management Plan

Roles and responsibilities

The PI and Co-PIs on this grant will be responsible for monitoring the data management plan, but the bulk execution of data management with be managed by the funded Executive Director of the Midwest Big Data Hub. This executive director will delegate responsibility as necessary to involved stakeholders.

Types of data

The principal activities of this proposal are related to the fostering of activities and collaboration between entities and parties. As such, data will not be directly generated, but indirect data such as the proceedings of meetings, documents relating to communication between spokes, rings, and nodes, and the overall conduct of the Hub will be generated. These documents will be stored, and as possible (respecting the privacy and potential sensitivity of participants) will be made publicly accessible. Documents will be stored in commonplace document formats, such as plain text or PDFs.

Policies for access and sharing and appropriate protection and privacy

Data relating to the proceedings of public meetings will be made immediately available; this will likely include slides, meeting notes, relevant white papers and solicitations. A website containing relevant information related to nodes, spokes, rings, and the overall hub itself will be created, and utilized for both recording of data and documents as well as dissemination of those documents. While public documents will be immediately and publicly accessible, sensitive documents (such as those related to financial information of private or industrial entities, details of inter-node agreements and the like) will be vetted by the executive committee and made available on a case-by-case basis to members of the Big Data Hub. Where position documents or other creative works (as opposed to minutes or sensitive documents) are created, they will be made available under a CC-BY license.

Data storage and preservation of access

Data will be made available on a website, likely through either a content management system such as Wordpress, MediaWiki or Confluence, and will be multiply backed up at different physical locations. In addition to this website, which be as institution-neutral as reasonably feasible to reflect the multi-institutional nature of the MBDH, the data generated under this project and information supporting preservation and reuse will be deposited in IDEALS (Illinois Digital Environment for Access to Learning and Scholarship), the campus digital repository at http://www.ideals.illinois.edu/. The website and its contents will be deposited into IDEALS as well.

BD Hubs: Midwest: SEEDCorn: Sustainable Enabling Environment for Data Collaboration

Project Personnel and Partner Organizations

1. Ed Seidel; National Center for Supercomputing Applications/University of Illinois Urbana-Champaign; PI and ***Interim Steering Council Chair and Data Tools and Services Lead***[1]
2. Beth Plale; Indiana University; co-PI, Sub-awardee, and ***Interim Steering Council – Data Sciences Spoke Lead***
3. Sara Nusser; Iowa State University; co-PI, Sub-awardee, and ***Interim Steering Council – Digital Agriculture Spoke Lead***
4. Brian Athey; University of Michigan; co-PI, Sub-awardee, and ***Interim Steering Council – Healthcare & Biomedical Spoke Lead***
5. Joshua Riedy; University of North Dakota; co-PI, Sub-awardee and *Interim Steering Council – At Large Member[2]/Data Sciences Spoke*
6. Caralynn Nowinski; UI LABS nonprofit; Senior Personnel and ***Interim Steering Council – Digital Manufacturing Spoke Lead***
7. Charlie Catlett; Argonne National Labs and University of Chicago; Senior Personnel and ***Interim Steering Council – Smart Cities and Communities Spoke Lead***
8. Klara Nahrstedt; University of Illinois Urbana-Champaign; Senior Personnel and ***Interim Steering Council – Food, Energy, Water Spoke Lead***
9. R. Babu Chinnam; Wayne State; Senior Personnel and ***Interim Steering Council – Business Analytics Spoke Lead***
10. Wolfgang Kliemann; Iowa State; Senior Personnel and ***Interim Steering Council – Education Ring Lead***
11. H. V. Jagadish; University of Michigan; Senior Personnel and ***Interim Steering Council – Transportation Spoke Lead***
12. Bernice Pescosolido; Indiana University; Senior Personnel and ***Interim Steering Council – Social Networks Spoke Lead***
13. Kevin Franklin[3]; University of Illinois Urbana-Champaign; ***Interim Steering Council – Diversity Lead***
14. Keith Ellison[4]; tranSMART Foundation; ***Interim Steering Council – Industry/Sustainability Lead***
15. Greg Monaco; Great Plains Network; Senior Personnel and *Interim Steering Council – At Large Member/Data Tools and Services Ring*
16. Jennifer Clark; University of Nebraska-Lincoln; Senior Personnel and *Interim Steering Council – At Large Member/Digital Agriculture Spoke*
17. Jun (Luke) Huan; University of Kansas; Senior Personnel and *Interim Steering Council – At Large Member/Food, Energy, Water Spoke*
18. Lior Shamir; Michigan Technological University; Senior Personnel and *Interim Steering Council – At Large Member/Education Ring*

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[1] Each ***Interim Steering Council Lead*** (**listed in bold**) also chairs an MBDH working group on a topic. The Interim Steering Council will be superseded by an elected council by March, 2016.
[2] Interim Steering Council *At Large Members* (*listed in italics*) have specific areas of interest listed, though they do not lead them.
[3] Franklin formally leads a Steering Council working group on diversity.
[4] Ellison formally leads a Steering Council working group on industry interests and sustainability.

19. Alex Yahja; National Center for Supercomputing Applications; Senior Personnel
20. Bob Grossman; University of Chicago; Senior Personnel
21. Dan Reed; University of Iowa; Senior Personnel
22. Diego Klabjan; Northwestern University; Senior Personnel
23. Ivo Dinov; University of Michigan; Senior Personnel
24. Joe Colletti; Iowa State; Senior Personnel
25. Kevin Smith; University of Michigan; Senior Personnel
26. Matt Turk; University of Illinois Urbana-Champaign; Senior Personnel
27. Michael Fry; University of Cincinnati; Senior Personnel
28. Placid Ferreira; University of Illinois Urbana-Champaign; Senior Personnel
29. Scott Wilkin; National Center for Supercomputing Applications; Senior Personnel
30. Shaowen Wang; University of Illinois Urbana-Champaign / National Center for Supercomputing Applications; Senior Personnel
31. Shashi Shekhar; University of Minnesota; Senior Personnel
32. Vallabh Sambamurthy; Michigan State; Senior Personnel
33. Brain Athey; University of Michigan; Senior Personnel
34. John Towns; National Center for Supercomputing Applications, National Data Service, XSEDE; Senior Personnel
35. Jun Li; University of Michigan; Senior Personnel
36. Maxine D. Brown; U Chicago; Senior Personnel
37. Sanjay Madria; Missouri University of Science and Technology; Senior Personnel
38. Yinlun Huang; Wayne State; Senior Personnel
39. Ravi Bapna; University of Minnesota; Senior Personnel
40. Gabrielle Allen; University of Illinois Urbana-Champaign; Senior Personnel
41. Allen Renear; University of Illinois Urbana-Champaign; Senior Personnel
42. Bertram Ludaescher; University of Illinois Urbana-Champaign; Senior Personnel
43. Caterina Scoglio; Kansas State University; Senior Personnel
44. Andrew Saykin; Indiana University; Senior Personnel
45. Eric Meslin; Indiana University; Senior Personnel
46. Fred H. Cate; Indiana University; Senior Personnel
47. Olaf Sporns; Indiana University; Senior Personnel
48. Rob Quick; Indiana University; Senior Personnel
49. Robert H. McDonald; Indiana University; Senior Personnel
50. Dr. Ashok Krishnamurthy; RENCI: Unpaid Collaborator
51. Srinivas Aluru & Dr. Ashok Krishnamurthy; South Big Data Regional Innovation Hub; Unpaid Collaborator
52. Kathleen McKeown; Northeast Big Data Innovation Hub; Unpaid Collaborator
53. Mike Norman; West Big Data Innovation Hub; Unpaid Collaborator
54. Jorge V. José; Indiana University; Unpaid Collaborator
55. David Broecker; Indiana Biosciences Research Institute; Unpaid Collaborator
56. Paul Gunderson; Dakota Precision Ag Center; Unpaid Collaborator
57. Patrick Pope; Nebraska Public Power District; Unpaid Collaborator
58. Kathy Schroeder, HIS Automotive, drive by Polk; Unpaid Collaborator
59. John Ginder; Ford Motor Company; Unpaid Collaborator
60. Daniel Vivian; General Motors Company; Unpaid Collaborator
61. Henry Benedetto; Dominos Pizza LLC; Unpaid Collaborator
62. Josephine Molle; Henry Ford Health System; Unpaid Collaborator

63. Ginny Walls; Macy's; Unpaid Collaborator
64. Mahesh Rajasekharan; Cleo Communications; Unpaid Collaborator
65. Brenna Berman; City of Chicago; Unpaid Collaborator
66. Heather Woodward-Hagg; Department of Veterans Affairs – VA Center for Applied Systems Engineering; Unpaid Collaborator
67. Lisa Phillip; Quicken Loans; Unpaid Collaborator
68. James Buntrock; Mayo Clinic; Unpaid Collaborator
69. John Reid; John Deere; Unpaid Collaborator
70. Nicholas Hatcher; QuesTek Innovations, LLC; Unpaid Collaborator
71. Stuart Aitken; 84.51°; Unpaid Collaborator
72. Kevin Kelley; Great American Insurance Company; Unpaid Collaborator
73. Jude Schramm; GE Aviation Information Technology; Unpaid Collaborator
74. Mitra Dutta; University of Illinois Chicago; Unpaid Collaborator
75. Dayle McDermitt; LI-COR, Inc.; Unpaid Collaborator
76. Beth Niblock; City of Detroit, Information Technology Services Department; Unpaid Collaborator
77. James Anderson; Urban Science Applications, Inc.; Unpaid Collaborator
78. Venkat Gone; Loven Systems, LLC; Unpaid Collaborator
79. P. Brighten Godfrey; Veriflow Systems, Inc.; Unpaid Collaborator
80. Paul Baniewicz; Alcatrel-Lucent; Unpaid Collaborator
81. Christopher Harbourt; Agrible; Unpaid Collaborator
82. Tel Ganesan; Kyyba, Inc.; Unpaid Collaborator
83. Paul Riser; TechTown Detroit; Unpaid Collaborator
84. Tony Brownlee, Kingland Systems; Unpaid Collaborator
85. Matt Spackman, Kum and Go; Unpaid Collaborator
86. Mary Berry; University of South Dakota; Unpaid Collaborator
87. James Tracy; University of Kansas; Unpaid Collaborator
88. Kevin Kephart; South Dakota State University; Unpaid Collaborator
89. Ophir Trigalo; Illinois Institute of Technology; Unpaid Collaborator
90. Chaille Becker; Caterpillar Inc.; Unpaid Collaborator
91. Susan Marquis; Pardee RAND Graduate School; Unpaid Collaborator
92. Nick Lindberg; Milwaukee Institute; Unpaid Collaborator
93. Tony Brownleee; Kingland Systems; Unpaid Collaborator
94. David Dittmann; Proctor & Gamble; Unpaid Collaborator
95. Matthew Gibb; Carle Health System; Unpaid Collaborator
96. Susan Ford; Southern Illinois University Carbondale; Unpaid Collaborator
97. James Garvey; Southern Illinois University Carbondale; Unpaid Collaborator
98. Raymond Goldsteen; University of North Dakota, Center for Comparative Effectiveness Analytics; Unpaid Collaborator
99. Jianglong Zhang; University of North Dakota, John D. Odegard School of Aerospace Sciences; Unpaid Collaborator
100. L. Keith Henry; University of North Dakota, Department of Basic Sciences; Unpaid Collaborator
101. Prem Paul; University of Nebraska, Lincoln; Unpaid Collaborator
102. Vipin Kumar; University of Minnesota; Unpaid Collaborator
103. Claudia Neuhauser; University of Minnesota; Unpaid Collaborator
104. Henry Foley; University of Missouri; Unpaid Collaborator

105. William S. Ball; University of Cincinnati; Unpaid Collaborator
106. S. Jack Hu; University of Michigan; Subawardee

June 18, 2015

Professor Edward Seidel
Principal Investigator
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
1205 West Clark Street
Urbana, IL 61801

Re: Letter of Collaboration for Midwest Big Data Hub Proposal in response to NSF 15-562 Program Solicitation

Dear Ed,

I am pleased to provide this letter confirming my intent to collaborate as co-Principal Investigator in the BD Hubs: Midwest: "SEEDCorn: Sustainable Enabling Environment for Data Collaboration" proposal that you are submitting in response to the NSF 15-562 Program Solicitation. The Midwest BD Hub (MBDH) Collaboration will leverage activities and resources of current MBDH partners to build a sustainable framework to better coordinate existing projects and to initiate and launch numerous new partnerships. As a framework for developing and deeply linking collaborations, education, and services around data, MBDH will facilitate partnerships between diverse types of institutions (colleges and universities, including their libraries, non-profit organizations, foundations, national labs, companies, and local and state government agencies) in our region.

In July 2015, the University of Michigan (U-M) will launch a five-year Data Science Initiative by creating the Michigan Data Science Institute (MIDAS) and strengthening investments in Data Science Services and Infrastructure. MIDAS will be comprised of an interdisciplinary core faculty of ~40 data scientists (statistics and mathematics, computer science and engineering, information science and a range of data science intensive application experts). MIDAS will also include a Data Science Challenge Initiatives Program (Learning Analytics, Transportation, Social Sciences, Personalized Health), a Data Science Education and Training Program as well as an Industry Engagement Program.

As MIDAS Co-Director Designate, I will ensure that the MBDH will be a priority for the industry and outreach office of MIDAS. MIDAS will actively engage in all MBDH activities, and will play a leadership role in the Healthcare, Transportation and Business Analytics Spoke activities.

I look forward to working with you and the SEEDCorn team to build new big data partnerships across the midwest region.

Sincerely,

Brian D. Athey, Ph.D.
Michael A. Savageau Collegiate Professor and Chair
Department of Computational Medicine & Bioinformatics (DCM&B)
Co-Director, Michigan Institute for Data Science (MIDAS)
University of Michigan

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

Office of the Vice President for Research
2610 Beardshear Hall
Ames, Iowa 50011-2036
515 294-6344
FAX 515 294-6100

To: NSF Big Data Regional Innovation Hubs (BD Hubs) Program

From: Dr. Sarah Nusser, Vice President for Research

By signing below, I acknowledge that I am listed as a collaborator on this proposal, entitled "Midwest Big Data Hub (MBDH)," with Dr. Edward Seidel as the Principal Investigator. I agree to undertake the tasks assigned to me or my organization, as described in the project description of the proposal, and I commit to provide or make available the resources specified therein.

Signed: _____

Organization: Iowa State University_____

Date: 05/29/15_____

June 20, 2015

Dr. Edward Seidel
Principal Investigator
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
1205 West Clark Street
Urbana, IL 61801

RE: Letter of Collaboration for Midwest Big Data Hub

Dear Dr. Seidel,

This letter confirms my enthusiastic support for and my willingness to collaborate on the proposed National Science Foundation application, *BDHubs: Midwest: SEEDCorn: Sustainable Enabling Environment for Data Collaboration.* The plans for the Midwest big data hub (MBDH) represent an exciting, innovative and important response to NSF's Big Data Regional Innovation Hubs Announcement - (BD Hubs, NSF 15-562).

As co-PI on the SEEDcorn proposal and Indiana University (IU) lead PI I see my role as bridging the organizations I represent and MBDH, and ensuring MBDH success.   As lead IU PI, I will strive to ensure Indiana University's engagement in MBDH is rich, visible, and mutually reinforcing, leveraging Pervasive Technology Institute and the IU Network Science Institute. Through my deep ties with the Research Data Alliance (RDA) as one of the founding members, I will make connections between suitable activity in MBDH to the larger Research Data Alliance where the activity can have wider national and international impact through wider adoption.   In my role as co-PI in the NSF Datanet funded Sustainable Environments, Actionable Data (SEAD) and lead of the data curation and publishing services, I am uniquely positioned to bring SEAD data curation and publishing technology to MBDH as need arises. As a director of the HathiTrust Research Center and lead of the MBDH Data Sciences ring, I am well positioned to develop MDBH expertise around secure computing environments for sensitive data, grow services for auditing trusted repositories, etc.

As co-PI of MBDH, I will serve on the Steering Council, and lead the activities of the Data Science ring.

Sincerely,

Professor Beth Plale
Science Director, Pervasive Technology Institute

PROVOST & VICE PRESIDENT FOR ACADEMIC AFFAIRS
TWAMLEY HALL ROOM 302
264 CENTENNIAL DRIVE STOP 8176
GRAND FORKS ND 58202-8176
(701) 777-2167
FAX (701) 777-4139

June 14, 2015

Dr. Edward Siedel
Principal Investigator
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
1205 West Clark Street
Urbana, IL 61801

Re: Letter of Collaboration for Midwest Big Data Hub

Dear Dr. Siedel,
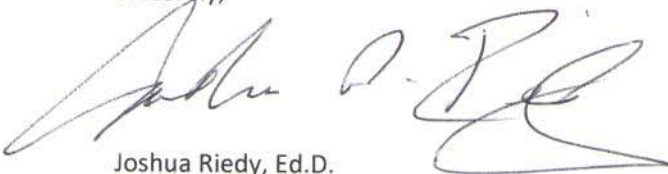
I am writing to inform you of my support, and my interest in collaborating with you to establish a Midwest Big Data Regional Innovation Hub (MBDH). As you know, challenges in managing complex data are numerous, and I believe the proposed Hub will be of great benefit in addressing those challenges. Furthermore, the MBDH will provide the Midwest region with excellent opportunities for developing innovative partnerships to solve the growing Big Data challenges. As such, I am thus excited to serve as the University of North Dakota (UND) Co-PI on the SEEDCorn proposal.

As the Vice-Provost and Chief Strategic Officer for UND it is my responsibility to implement institutional use of strategic intelligence and function as the university's chief information officer. To this end, I have served on committees that have established, or continue to maintain, successful multi-institutional partnerships including the Grand Sky UAS Park, Northern Tier Network Consortium, and the Northern Plains UAS Authority. Through my participation in these organizations, I have seen firsthand how the data deluge is affecting the implementation of research applications across a number of fields. To address these issues in our region, I have exerted considerable effort to envision and then guide a plan for dealing with Big Data to unanimous approval by the North Dakota State Board of Higher Education. That plan would establish a Collaborative Center for Computation and Data (CCCD) that is intended to serve as a nexus of public-private partnerships to foster solutions for data management and analysis; the CCCD is complementary to MCDH.

As the partnerships of the proposed Midwest Big Data Regional Innovation Hub grow, we look forward to augmenting our local activities and knowledge with those of the Hub, and sharing our expertise with its collaborating partners.

I wish you the best of luck with the SEEDCorn proposal, and anticipate the great success of all the Hub partnerships.

Sincerely,

Joshua Riedy, Ed.D.

National Center for Supercomputing Applications
1008 NCSA Building
1205 West Clark Street
Urbana, IL 61801

June 21st, 2015

Dear Prof. Seidel,

I am writing to confirm my intent to participate in the Midwest Big Data Hub (MBDH) initiative team led by you at the University of Illinois at Urbana-Champaign. I am an Associate Director at the National Center for Supercomputing Applications (NCSA), and a Professor in the Department of Astronomy, with a background in large-scale computation, collaborative tools, and community building.

At NCSA I lead the development of research and education programs, and in this role I commit to participating in the activities of the MBDH toward developing cross-cutting, synergistic activities between institutions, organizations, industrial partners and individuals; this includes conferences, workshops, and developing partnerships between members. I authorize my name to be added as Senior Personnel on the grant proposal, and I look forward to participating in the activities of the Hub should the grant be awarded.

Sincerely,

Yours sincerely

Dr Gabrielle Allen
Associate Director, Research and Education

Edward Seidel
Director, National Center for Supercomputing Applications
University of Illinois at Urbana-Champaign

Dear Dr. Seidel:

It is with great enthusiasm that I write to express my intent to collaborate on the project titled:
BD Hubs: MIDWEST: "SEEDCorn: Sustainable Enabling Environment for Data Collaboration"
that you are submitting in response to NSF's Big Data Regional Innovation Hubs - (BD Hubs, NSF 15-562). The BD Hubs project proposes: help the BD hub center around two key initiatives:

"Our role in helping the BD hub will center around two key initiatives:

- As the co-director of the Social Media and Business Analytics Collaborartive (SOBACO), the university of Minnesota wide research center, that brings together researchers and industry leaders to collaborate and advance understanding of today's data-rich, socially networked world, I will extend the research capabilities of the BD-Hub to a rich network of companies and scientists. Together we will co-create new knowledge to help people, businesses, and society thrive.
- On the teaching front, we already have an extensive practice of converting knowledge from research into teaching cases. This will enhance the teaching mission of the BD-Hub. At http://sobaco.umn.edu/cases we list a set of teaching cases with an emphasis on data, business analytics, social media, and related topics. Developed in cooperation with faculty at the University of Minnesota and elsewhere, these cases have been used in graduate level analytics courses, MBA programs, and executive education courses around the world.

I look forward to working with you and your team!

Sincerely,

Ravi Bapna
Curtis L. Carlson Chair in Business Analytics and Information Systems
Department Chair, Information and Decision Sciences
Carlson School of Management
University of Minnesota

Senior Personnel

June 22, 2015

Dr. Edward Seidel
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications, UIUC
1205 West Clark Street
Urbana, IL 61801

Re: Midwest Big Data Regional Innovation Hub
UIC Letter of Collaboration – Maxine D. Brown

Dear Dr. Seidel:

As the University of Illinois at Chicago (UIC) representative to the NSF Midwest Big Data Regional Innovation Hub, I am excited to work with your collaborators in order to create a mutually beneficial, innovative data resource for the Midwest region, and ultimately the nation.

I direct the UIC Electronic Visualization Laboratory (EVL), which has had a successful 42-year history of developing the teams, tools, hardware, system software, and human interface models on an accelerated schedule to enable multi-site collaborations for complex problem solving. In particular, since its earliest collaborations with NCSA in 1986, and now with collaborations with Argonne National Laboratory, EVL has helped pioneer high-performance computing, networking, visualization and user-interaction methodologies for Big Data.

As the scale and complexity of data grows, as the speeds of supercomputers increase to tackle simulations from the macro- to the micro-scale, and as sensors gather data at increasing rates, EVL has been advancing cyberinfrastructure to develop ultra-resolution big displays (e.g., CAVE2) as well as the software to use them (e.g., SAGE2, OmegaLib), and to put in place multi-gigabit networks (e.g., StarLight) to create end-to-end, tightly coupled, distributed systems. Also, EVL faculty has been teaching courses in visualization, visual analytics, information visualization, scientific visualization and medical visualization using these tools.

EVL is often approached by academic, industrial and government agencies to discuss how its expertise in visualization and visual analytics, combined with big displays and big networks, can help them gain insight into their collections of big data. By working with the Midwest Big Data Regional Innovation Hub, EVL can be a resource for scientists with big data problems and help them innovate and collaborate.

UIC recently asked me to work with the Deans of various UIC Colleges to help organize an integrated, multi-college data science program, such that UIC can better serve students, research communities and businesses in the city and the state of Illinois. This will also better enable UIC to serve the Midwest Big Data Regional Hub and provide technical and intellectual leadership.

Because UIC values EVL and is aware of our long-term commitment to high-performance computing, I have served as the designated delegate to the NCSA-organized Advanced Computing Innovation Partnership (ACIP), started in 2014, and as a member of the Board of Directors of the Great Lakes Consortium for Petascale Computing (GLCPC) since 2009, and served as the GLCPC President in 2010-11. Because of my background and strong allegiance to NCSA, I am delighted to serve as key personnel on the Midwest Big Data Regional Hub proposal. UIC is committed to the success of the Hub and I will work to identify, contact, and engage our faculty, staff and students in the Hub's many activities.

Sincerely,

Maxine D. Brown
Director, Electronic Visualization Laboratory
maxine@uic.edu

Electronic Visualization   **The University**   **851 S Morgan St**   **312 996 3002 p**
Laboratory   **of Illinois at Chicago** **1120 SEO, MC 152**   **312 413 7585 f**

June 18, 2015

Dr. Edward Seidel
Principal Investigator
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
1205 West Clark Street
Urbana, IL 61801

RE: Letter of Collaboration for Midwest Big Data Hub

Dear Dr. Seidel:

This letter confirms my commitment to serve as senior personnel on the IU subcontract to the proposed National Science Foundation application, **BD Hubs: Midwest: "SEEDCorn: Sustainable Enabling Environment for Data Collaboration."**

As Founding Director of the Center for Applied Cybersecurity Research, and as Director of the Center for Law, Ethics, and Applied Research in Health Information (CLEAR), I am especially enthusiastic about collaborating with the Spoke 6 – Network Science team to develop and provide workshops and other instructional materials on issues of cybersecurity and data ethics. In 2010, following a conference on Establishing a Research Agenda for Privacy and Security of Healthcare Technologies, the Center for Applied Cybersecurity Research (CACR) created the Center for Law, Ethics, and Applied Research in Health Information (www.clearhealthinfo.iu.edu) in partnership with the Maurer School of Law, the School of Medicine, the School of Informatics, and the Vice President for Information Technology. CLEAR addresses the ethical, policy and user issues necessary for enhancing the use of health information in treatment and research through research into current legal and other impediments to that use; practical demonstration projects of how personal information can be used more effectively to improve health and quality of life; proposals for specific regulatory change necessary to facilitate the responsible use of health data; consensus-building among key constituencies in industry, patient groups, academia, philanthropy, and government; and educational efforts targeting patients, the public, press, and policy makers.

CLEAR is both interdisciplinary and collaborative, working with key stakeholders in in all of its projects. With offices and advanced video conferencing facilities on both the Bloomington and Indianapolis campuses, CLEAR is actively involved in advancing Big Data science in the context of biomedical research, supports the OECD Panel of Experts on Health Information Infrastructure, and will facilitate the current initiative through its expertise in legal, ethical, and user issues in health information; through administrative

and professional staff support; and through interaction with its Stakeholder Group (which includes representatives from Acxiom, Amgen, the Data Protection Commissioner of British Columbia, the Center for Democracy and Technology, C-Change, CVS/Caremark, GE, Intel, Iowa Health Systems, Lilly, McAfee, Merck, Microsoft, No More Clipboard, Oracle, and Proteus, in addition to academic researchers).

I look forward to collaborating with the Midwest Big Data Regional Innovation Hub team and being part of this innovative NSF initiative.

Sincerely,

Fred H. Cate
Distinguished Professor and
C. Ben Dutton Professor of Law

An initiative of the
Computation Institute
at the University of Chicago
and Argonne National Laboratory

June 18, 2015

Dr. Edward Seidel
Principal Investigator
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
1205 West Clark Street
Urbana, IL 61801

Re: Letter of Collaboration for Midwest Big Data Hub

Dear Dr. Seidel,

It is with great pleasure that I write this letter of collaboration and support for your application to establish a Midwest Big Data Regional Innovation Hub. Your proposed Hub has great potential for developing new partnerships in Big Data focused on key challenges in the Midwest Region.

I serve as the Director of the Urban Center for Computation and Data (UrbanCCD) a joint initiative of the Computation Institute at the University of Chicago and Argonne National Laboratory. UrbanCCD combines the complementary strengths of Argonne National Laboratory in physical sciences and engineering with University of Chicago's expertise in social sciences, economics, and policy. The center creates computational research tools and leads initiatives that unite academic researchers, government agencies, architectural firms, private enterprise, and civic volunteers in ambitious efforts to understand and improve our cities. I am thus excited to serve as key personnel on your application. My institution is committed to the success of the Hub and has supported my involvement in the design of the partnerships and the spoke in Urban Science and Smart Cities. We have existing municipal, industry, and academic partnerships in the areas of urban data science, computational modeling, urban sensing, and public policy that would benefit from the Big Data Regional Innovation Hub that you propose.

In addition to partnerships, UrbanCCD, the Computation Institute, Argonne National Laboratory, and the University of Chicago are willing to collaborate in workshops to develop common interests and understanding of regional needs, participate in creating Big Data sharing policies and best practices, host guest lecturers and presenters to speak to regional audiences about Big Data, and participate in development of educational materials and opportunities.

UrbanCCD has considerable strengths that are relevant to the Urban Science and Smart Cities spoke. Since I founded the Center in 2012, we have developed a number of resources and tools that leverage big data to benefit cities and bring together interdisciplinary teams to address relevant challenges and opportunities. To name a few, through funding from a National Science Foundation EAGER grant we created Plenario (http://plenar.io) Plenario, currently in alpha, enables scientists to select a geographic area, determine what data is available about that area, and extract an integrated collection of selected data sets for a particular time period for further analysis. Additionally, we are finalizing the development of Array of Things (AoT). AoT)

An initiative of the
Computation Institute
at the University of Chicago
and Argonne National Laboratory

is a network of interactive, modular sensor boxes that collect real-time data on a city's environment, infrastructure, and activity for research and public use. The goal of the project is to better understand the natural and built environment of the city and its impact on livability with respect to climate, air quality, noise, and other factors -- effectively creating a "fitness tracker". Finally, UrbanCCD created the Urban Sciences Research Coordination Network (US-RCN), a National Science Foundation-funded effort, with the intention to develop an interdisciplinary, data-driven approach to urban research, analysis, and planning. Teams of computer scientists, mathematicians, public health and education experts, architects, urban planners, social scientists, and artists leverage a unique and growing collection of data sets from public and private sources to study the effects of policy decisions, investments, urban development, and other interventions on cities and residents.

I wish you success with your application and look forward to continuing our collaborations for the success of the Hub.

Sincerely,

Charlie Catlett
Director, Urban Center for Computation and Data
Senior Fellow, Computation Institute of the University of Chicago and Argonne National Laboratory
Senior Computer Scientist, Argonne National Laboratory
Visiting Artist, School of the Art Institute of Chicago
catlett@anl.gov

WAYNE STATE UNIVERSITY

INDUSTRIAL & SYSTEMS ENGINEERING

RATNA BABU CHINNAM, PH.D.

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June 11, 2015

Dr. Edward Seidel
Principal Investigator, Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
1205 West Clark Street, Urbana, IL 61801

Subject: Letter of Collaboration for Midwest Big Data Hub

Dear Dr. Seidel,

It is with great pleasure that I write this letter of collaboration and support for your application to establish a Midwest Big Data Regional Innovation Hub. Your proposed Hub has great potential for developing new partnerships in Big Data focused on key challenges in the Midwest Region.

I serve as the Director for the Big Data & Business Analytics Group at Wayne State University. It is a university-wide initiative with a charter to assist the business community and agencies in their Big Data adoption value extraction challenges. It actively promotes related research and offers education and training programs. The group is a premier center of innovation in Big Data Science and Business Analytics within the South-East Michigan area and has a strong focus on solving real-life business problems in active collaboration with regional industry while leveraging core strengths and research interests of our team. As you know, Big Data Management & Big Data Analytics require a slew of advanced concepts, tools, and technologies and a close collaboration among an interdisciplinary team of subject matter experts. Our group has assembled a cross-departmental team of experts who have extensive experience in successfully delivering and leading a variety of big data and business analytics projects and initiatives across several industries such as healthcare, manufacturing and automotive, retail, transportation, defense, and government. We also organize annual symposia on Big Data & Business Analytics, mostly targeting the business community. These symposia attract over 200 participants, mostly from industry, with participation from leading big data vendors.

In addition, we have extensive relationships with industry. I personally have extensive experience in analytics consulting and have worked with such companies/organizations as Chrysler, Ford, General Motors, Sirius Satellite Radio, General Dynamics Land Systems, Energy Conversion Devices, Dominos, CapGemini, Faurecia, Whirlpool, Steelcase, MRF Tyres, Urban Science, dFOUNDRY, MTS Technologies, and DataFactZ. We also have several ongoing research and development projects focused on Business Analytics with companies from a variety of industries/sectors.

I am excited to serve as the proposed lead for the Business Analytics Spoke as well as a member of the hub Steering Committee. I am also happy to serve as a Co-Lead for the Transportation and Urban Science / Smart Cities spokes. My institution is committed to the success of the Hub and has supported my involvement in the design of the proposed partnerships and sustainability. They have expressed strong willingness to continue their support.

I am also delighted to report that I have already obtained strong letters of collaboration for the proposed hub from such companies as General Motors, Henry Ford Health System, Urban Science, Veterans Administration, Loven Systems, Tech Town Detroit, Kyyba, as well as the City of Detroit.

I wish you success with your application and look forward to continuing our collaborations for the success of the Hub.

Sincerely,

Ratna Babu Chinnam, Ph.D.
Director, Big Data & Business Analytics Group

June 8, 2015

Dr. Edward Seidel
Principal Investigator
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
1205 West Clark Street
Urbana, IL 61801

Re: Letter of Collaboration for Midwest Big Data Hub

Dear Dr. Seidel,

It is with great pleasure that I write this letter of collaboration and support for your application to establish a Midwest Big Data Regional Innovation Hub. Your proposed Hub has great potential for developing new partnerships in Big Data focused on key challenges in the Midwest Region.

I serve as Director of the Computational Sciences Initiative at the University of Nebraska Lincoln. The Computational Sciences Initiative is a university-wide Program of Excellence in the data sciences focused on advancing both education and research in Big Data and data analytics, with a specific emphasis on the life sciences. We have several ongoing projects focused on metagenomics, host-microbial interactions, rumen virology and health, and precision agriculture. I am thus excited to serve as key personnel on your application. My institution is committed to the success of the Hub and has supported my involvement in the design of the partnerships and sustainability, the spoke in Digital Agriculture, and the ring in Data Sciences. They have expressed their willingness to continue their support, and I will be working with our Office of Industry Relations to identify, contact, and engage potential partners both in the State of Nebraska and nearby states. We have existing partnerships in the areas of digitial agriculture, advanced manufacturing, and transportation that would benefit from the Big Data Regional Innovation Hub that you propose.

In addition to industry partnerships, my Initiative and UNL are willing to collaborate in workshops to develop common interests and understanding of regional needs, participate in creating Big Data sharing policies and best practices, host guest lecturers and presenters to speak to regional audiences about Big Data, and participate in development of educational materials and opportunities. Over the past three years we have developed a new PhD program focused on Big Data in life sciences research and an undergraduate minor in Informatics, and the University of Nebraska at Omaha has developed a certificate in Data Sciences. Our partners may benefit from the courses and educational materials that have been developed for these programs, and for access to the students who are participating in these programs.

UNL has considerable strengths that are relevant to the spoke in Digital Agriculture; these strengths involve areas such as plant phenotyping, UAV/UAEs, advanced land and water management, and crop genomics. We look forward to working with the proposed Midwest Big Data Regional Innovation Hub as a means for sharing our expertise and collaborating with other

institutions to address critical agricultural challenges. We also have the UNL Holland Computing Center (HCC) for high performance computing and data storage. The HCC is part of the Open Science Grid and Internet 2, and has considerable experience in managing Big Data from its many years of collaboration with the CERN Light Hadron Collidor (LHC). HCC has expressed interest in the Hub and willingness to share expertise and resources for the benefit of new partnerships.

I wish you success with your application and look forward to continuing our collaborations for the success of the Hub.

With kind regards,

Jennifer Clarke, Ph.D.
Director, Computational Sciences Initiative
Associate Professor, Department of Statistics,
Department of Food Science and Technology
University of Nebraska-Lincoln
jclarke3@unl.edu

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

College of Agriculture and Life Sciences
Experiment Station
138 Curtiss Hall
Ames, Iowa 50011-1050
515 294-1823
FAX 515 294-6800

June 18, 2015

Edward Seidel
Director, National Center for Supercomputing Applications
University of Illinois at Urbana-Champaign

Dear Dr. Seidel:
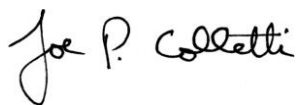
It is with great enthusiasm that I write to express my intent to collaborate on the project entitled: **BD Hubs: Midwest: "SEEDCorn: Sustainable Enabling Environment for Data Collaboration"** that you are submitting in response to NSF's Big Data Regional Innovation Hubs - (BD Hubs, NSF 15-562).

I am excited to collaborate on the Digital Agriculture (Spoke 4) aspect of the Midwest BDH proposal. With the goal of the DA spoke to integrate agriculturally-related sciences with data sciences, I believe that Iowa State University, and faculty from the college of Agriculture and Life Sciences in particular, are well positioned to address the multiple aspects of DA that include but not limited to precision agriculture, agroecosystem management, predictive biosciences, climate modeling, and integrated socio-economic-environmental modeling.

In the main, I believe that the DA research (and associated deployment of work products) will enhance the productivity, profitability, diversity and resiliency of the agroecosystem to produce desired market goods and non-market services. I am ready to take a leadership role with key faculty from the consortium with the DA research and development efforts and to ensure linkage with the BD Hub: Midwest so as to cause obtainment of the project's goals and objectives.

I look forward to working with you and the team!

Sincerely,

Joe P. Colletti
Senior Associate Dean &
Associate Director, Iowa Agriculture & Home Economics Experiment Station

SCHOOL OF NURSING
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UNIVERSITY OF MICHIGAN

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June 9, 2015

Dr. Edward Seidel
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications, UIUC
1205 West Clark Street
Urbana, IL 61801

RE: Midwest Big Data Regional Innovation Hub – Letter of Collaboration

Dear Dr. Seidel:

I am very excited to participate in the NSF Midwest Big Data Regional Innovation Hub proposal as part of the University of Michigan. This collaboration to establish a new Midwest Big Data Regional Innovation Hub will significantly increase the Midwest Region scope, depth and capabilities for developing innovative platforms and the enable the formation of partnerships in Big Data analytics.

I direct of the Statistics Online Computational Resource (SOCR), the Biostatistics Core of the Udall Center of Excellence in Parkinson's disease (PD) research, and co-direct of the Michigan Institute for Data Science (MIDAS) at the University of Michigan. SOCR designs, validates and freely disseminates knowledge. Specifically, it provides portable online resources for probability and statistics education, technology based instruction and high-throughput statistical computing. The Udall Center collects Big imaging, genetics, clinical, physiological and environmental data and conducts experimental, computational and human research to investigate the cause and progression of neuro-degeneration in the pathogenesis of gait dysfunction in PD. MIDAS is actively engaged in Data Science research addressing a gamut of Big Data driven challenges – from data management, to data curation, sharing, processing, high-throughput analytics, visualization, and interpretation. Like this Big Data Hub initiative, MIDAS is truly trans-disciplinary engaging faculty, students and investigators in the areas of astronomy, evolutionary biology, disease model discovery, health policy, materials synthesis, engineering, informatics, computational sciences, personalized medicine, and social sciences.

In the past year, the University of Michigan established a new undergraduate degree in data science and a graduate data science certificate program. The university has allocated over $42.5M for MIDAS and we expect to hire 45 new data science faculty in the next several years to support the intense research collaborations, student and trainee educational needs and to advance the fundamental methodological and exploratory data science analytics. As part of the Midwest Big Data Hub, I will collaborate with you and the multi-institution team to set priorities, allocate resources, develop infrastructure and design new data analysis methods for managing large, complex and heterogeneous datasets. I believe that this Hub will significantly contribute to the ongoing success of the national Big Data efforts and will advance the goals of the national clinical, research and education agencies, including NSF.

Best regards,

Ivo D. Dinov, Ph.D.
Assoc. Prof. and Director
Statistics Online Computational Resource (SOCR)
Email: statistics@mich.edu
URL: www.socr.umich.edu

Leading the way.

UNIVERSITY OF ILLINOIS
AT URBANA-CHAMPAIGN

Department of Mechanical Science and Engineering

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June 16, 2015

Dr. Edward Seidel
Principal Investigator
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
1205 West Clark Street
Urbana, IL 61801

Re: Letter of Collaboration for Midwest Big Data Hub

Dear Dr. Seidel,

It is with great pleasure that I write this letter of collaboration and support for your application to establish a Midwest Big Data Regional Innovation Hub. Your proposed Big Data Hub has great potential for developing new partnerships in Big Data focused on key challenges in the Midwest Region.

I serve as the Head of Mechanical Science and Engineering at Illinois and much of my research is focused on defining the next generation of manufacturing infrastructure which, clearly, will greatly depend on its ability to leverage the cyberinfrastructure. In the emerging paradigm of advanced digital manufacturing, the ability to store, access, and analyze vast amounts of data to support real-time decision making is a foundational capability. For example, in the DMDII (Digital Manufacturing and Design Innovation Institute) where I serve on the technical advisory board, the 'digital thread' – a complete, unambiguous record of design intent, detailed design, manufacturing plans, manufacturing execution, inspection and testing – is seen as a key enabler of advanced manufacturing. Cyberinfrastructure and big data are seen as key competitive advantages for US original equipment manufacturers. We have existing projects with companies through DMDII. Additionally, we have several projects pending, involving several multinational as well as small and medium size manufacturers. We believe the Midwest Big Data Regional Innovation Hub can play a defining role in articulating and demonstrating the dormant opportunity of the industrial internet and cyberphysical manufacturing. We look forward to working closely with you to defining the role and opportunity for big data in manufacturing

Sincerely,

Placid M. Ferreira
Department Head
Tungchao Julia Lu Professor
PMF:pkm

June 22, 2015

Re: Collaboration Letter for Midwest Big Data Regional Innovation Hub

Dear Dr. Seidel,

Thank you for the invitation to participate as Senior Personnel and on the Advisory Board for the Midwest Big Data Regional Innovation Hub. As you know I am excited about your plans for the Hub and believe that it will offer many interesting opportunities for collaboration on future large-scale data projects in the Midwest.

It is my honor to be invited to participate and I write this letter of support for your application for support for a Midwest Big Data Regional Innovation Hub. As Executive Director of the Institute for Computing in the Humanities, Arts and Social Sciences (I-CHASS) at the University of Illinois Urbana Champaign and a Senior Advisor to the NCSA Director for Diversity and Inclusion. I recognize the importance of establishing at the onset a diverse and inclusive partnership for such and major endeavor. I believe that my background, which includes expertise in diversity as well as computing, research and education will be an asset to the project team. I am excited to be considered a key personnel for your proposal.

I look forward to working with you on this project.

Sincerely,

Kevin D. Franklin

**Department of Operations, Business
Analytics & Information Systems
Carl H. Lindner College of Business**

University of Cincinnati
533 Lindner Hall
Cincinnati OH 45221-0130
Phone: (513) 556-0404
Email: mike.fry@uc.edu

June 11, 2015

Dr. Edward Seidel
Principal Investigator
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
1205 West Clark Street
Urbana, IL 61801

Re: Letter of Collaboration for Midwest Big Data Hub

Dear Dr. Seidel,

It is with great pleasure that I write this letter of collaboration and support for your application to establish a Midwest Big Data Regional Innovation Hub. Your proposed Hub has great potential for developing new partnerships in Big Data and Analytics focused on key challenges in the Midwest Region.

I serve as Director of the Center for Business Analytics and Department Head of the Operations, Business Analytics & Information Systems Department at the University of Cincinnati. The Center for Business Analytics is an affiliation between the University of Cincinnati and 20 member companies to advance research, teaching and recognition of analytics and applications of big data. The Center supports applied research, training events, and large symposium-type events that bring in world-renowned speakers on business analytics and big data topics. Corporate members of our Center for Business Analytics include Procter & Gamble, Kroger, Macy's, SAS, US Bank, EY, and many others. Many of these Center members have agreed to participate in this NSF effort, and all of our Center members have existing strengths and needs for additional university resources related to big data and analytics.

My department of Operations, Business Analytics and Information Systems in the Lindner College of Business at the University of Cincinnati has considerable expertise in statistics, operations-modeling, data management and other big data and analytics methodologies. Our faculty and students have a long track record as leading researchers and consultants to practitioners in analytics. Our Master of Science in Business Analytics program is one of the largest and oldest such programs in the country. Last year, we admitted 86 MS Business Analytics students; our program has existed for more than 30 years (previously known as MS in Quantitative Analysis). My department has additional graduate programs in Data Analytics and Data Science. Additionally, the University of Cincinnati has recently announced three areas of focus for university-wide research efforts with supporting cluster hires and millions of dollars in additional research efforts. These three areas are: cancer, water and analytics. Associated with this university-wide cluster hire, the University of Cincinnati will be

establishing an Institute of Analytics Innovation which will foster additional collaborative efforts in the area of analytics. Clearly, analytics and issues related to big data are areas of research focus and additional investment at the University of Cincinnati that builds on our existing strengths.

I look forward to collaborating on this NSF sponsored research and involving additional faculty and resources from the University of Cincinnati.

Sincerely,

Michael J. Fry, Ph.D.
Professor and Department Head
Operations, Business Analytics, & Information Systems
Director, Center of Business Analytics
Lindner College of Business
University of Cincinnati

THE UNIVERSITY OF CHICAGO

Robert Grossman, PhD

Chief Research Informatics Officer of the Division of the Biological Sciences

Director, Center for Data Intensive Science

Core Faculty and Senior Fellow, Institute for Genomics & Systems Biology

Core Faculty and Senior Fellow, Computation Institute

Professor of Medicine, Section of Genetic Medicine

June 12, 2015

Dr. Edward Siedel
Principal Investigator
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
1205 West Clark Street
Urbana, IL 61801

Re: Letter of Collaboration for Midwest Big Data Hub

Dear Dr. Sidel,

This letter is to convey my support and interest in collaboration with you in your application to establish a Midwest Big Data Regional Innovation Hub. I believe your application has amazing potential for developing new partnerships in Big Data and focusing on challenges in the Midwest Region.

As you know I am the Chief Research Informatics Officer for the Division of Biological Sciences at the University of Chicago and the founder of the Open Science Data Cloud (OSDC), which is operated jointly with the University of Chicago Center for Data Intensive Science and the Open Science Data Cloud (OCC), a 501 (c)(3) not-for-profit. The OSDC supports the scientific, environmental, medical, and health care related community. Our clouds host and provide over 2.5 PB of data to the research community and have provided compute and storage services to over 750 investigators working in data intensive science. The OSDC has provided services for over 700 research projects since its inception in 2010 and has a wide-reaching, multi-campus, multi-institutional, interdisciplinary user base. We have experience in operating multi-petabyte science clouds with access to multidisciplinary data commons. We are working to reduce the challenges of big data research by: 1) operating science clouds and data commons; 2) prototyping a national data peering infrastructure consisting of Data Exchange (DX) points so that a researcher using the resources of one data commons can access the data in another data commons that peers with it; 3) supporting the open source software that enables data commons and data peering so that it is easier for universities and other research organizations to set up data commons and data peering infrastructures.

My research focuses primarily on bioinformatics, especially developing systems, application, and algorithms so that large datasets of genomics data can be integrated and analyzed to obtain a deeper understanding of diseases. I also have a research group that focuses on bioinformatics, data mining, cloud computing, and data intensive computing.

We look forward to working with the proposed Midwest Big Data Regional Innovation Hub to share our expertise and collaborating with the other institutions to address big data challenges.

900 East 57th Street, Room 10142 · Chicago, Illinois 60637

Telephone: 773-702-5660 · Fax: 773-834-2877 · E-mail: robert.grossman@uchicago.edu

I wish you success with you application and look forward to continuing collaborations for the success of the Hub.

Best regards,

Robert L. Grossman, Ph.D

June 10, 2015

Dr. Edward Seidel
Principal Investigator
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
1205 West Clark Street
Urbana, IL 61801

Re: Letter of Collaboration for Midwest Big Data Hub

Dear Professor Seidel:

I am thrilled to write this letter of collaboration for your application to establish a Midwest Big Data Regional Innovation Hub. MBDH is an initiative that will have long and standing impact to big data research, education, and industry partners.

At KU I direct the Data Science and Computational Life Sciences Laboratory (DSCL) at KU Information and Telecommunication Technology Center (ITTC). In this laboratory we have 7 faculty members, about 20 graduate students and undergraduate students and we work on many aspects of data science including but not limited to machine learning, data mining, database, security and privacy, information retrieval, image analysis, computer vision, and data visualization. Below I highlight a couple of research initiatives that are highly complementary to MBDH. We are willing to share research challenges and research discovers with the large research community through MBDH.

KU DSCL laboratory has extensive collaboration with KU School of Pharmacy, KU Computational Biology Center, KU Bio Engineering program, KU Medical School. For example I serve as the director of the Cheminformatics Core of the KU NIH Specialized Chemistry, an institute established by a $20M grant from NIH. Through KU SCC, we have access to high throughput screen chemical biology data nationally. We have built comprehensive databases for chemical biology, recording the interactions of small molecules and biological systems at many levels.

Starting in 2015, we started a new initiative for Data Science in the Food, Energy, and Water (FEW) research. We have assembled a truly interdisciplinary team with more than 30 faculty members from three state flagship universities: the University of

Kansas, the Kansas State University, and the University of Arkansas. Project investigators are composed of both seasoned and junior investigators with complementary expertise, as needed to design and implement our plan.

KU, one of only 34 U.S. public institutions in the prestigious Association of American Universities, is a major research university with a distinguished record of research collaboration promoted through independent, multidisciplinary research centers that focus on common themes. I lead the KU Data Science Initiative with investigators from KU Business School, School of Education, the College of Liberal Arts and Sciences, Engineering, Pharmacy, and Medicine.

KU has investigated steadily on the big data infrastructure. With the strong support from KU I successfully led a team of over 12 scientists and IT professionals across the KU campus to secure a $4.6M G20 grant from NIH. The funding is utilized to renovate additional 1,300 sft space for ACF and has upgraded the power, cooling, and rack systems for ACF. Though the funding is specifically utilized for renovate the cold room of ACF and not to purchase any computing equipment, the updated facility now have the adequate power, cooling, and rack capacity to host additional 24,000 servers. The project is completed in 2013 and the registered users tripled since then. We are happy to share the resources that we have here in any capacity that we can.

Kansas City hosts many Fortune 500 companies including Sprint, Cerner, Black & Veatch among others. There is a strong and increasing demanding on workforce with data science skills. Recognizing that we are working with the KU Continuous Education to design education program meets local needs.

In summary we have been heavily involved in the research, education, and service components of big data and we are very happy to be included in MBD hub initiative and we expect to work with you closely to contribute our expertise in the domain.

Sincerely yours,

Jun Huan, Ph.D.
Professor, Department of Electrical Engineering and Computer Science,
Director, Data Science and Computational Life Sciences Laboratory
University of Kansas
Lawrence, KS, 66047, USA
Email: jhuan@ku.edu

WAYNE STATE UNIVERSITY

COLLEGE OF ENGINEERING

June 23, 2015

Dr. Edward Seidel
Principal Investigator, Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
1205 West Clark Street
Urbana, IL 61801

Subject: Letter of Collaboration for Midwest Big Data Hub

Dear Dr. Seidel,

I am very pleased to learn that you are leading a multi-institutional group to propose establishment of a Midwest Big Data Regional Innovation Hub. I am writing this letter of collaboration to support your application.

At Wayne State University, I am directing the Laboratory for Multiscale Complex Systems Science and Engineering. Over the past two decades, we have been studying the development of multiscale and complex systems theories, and sustainability science, with applied research on integrated material-product-process design and manufacturing, where sustainability principles are applied at different length-time scales. Our research has led to various successful industrial applications. At the national level, I have been leading an NSF funded RCN SEES project, titled Sustainable Manufacturing Advances in Research and Technology (SMART) Coordination Network, which has a collaboration of 21 domestic and foreign universities and 11 national organizations/university centers. It is our experience that Big Data and Advanced Analytics can revolutionize multiscale, sustainable design and manufacturing. It can streamline design activities and manufacturing value chains by finding the core determinants of material, product, process, and enterprise performance, and then taking action to continually improve them. In August 2013, the SMART Coordination Network held an NSF sponsored Sustainable Manufacturing Roadmap Development Workshop, where big data issues were discussed. On August 20-21 this year, we will organize another NSF workshop on Critical Research Needs in Sustainable Manufacturing, where big data and analytics will be a key area for discussion among 50 invited academic leading scholars, industrial leaders and governmental funding agency officers.

The Midwest Big Data Regional Innovation Hub you are leading to propose to NSF is very timely. I am very pleased to be part of the team for the Advanced Manufacturing Spoke. I wish you success with your application and look forward to continuing our collaborations for the success of the Hub.

Sincerely,

Yinlun Huang, Ph.D.
Professor, Chemical Engineering and Materials Science
Director, Laboratory for Multiscale Complex Systems Science and Engineering
Director, The NSF RCN-SEES SMART Coordination Network Project
Co-Director, Sustainable Engineering Graduate Certificate Program, College of Engineering

June 18, 2015

Professor Edward Seidel
Principal Investigator
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
1205 West Clark Street
Urbana, IL 61801

Re: Letter of Collaboration for Midwest Big Data Hub Proposal in response to NSF 15-562 Program Solicitation

Dear Ed,

I am pleased to provide this letter confirming my intent to collaborate in the *BD Hubs: Midwest: "SEEDCorn: Sustainable Enabling Environment for Data Collaboration"* proposal that you are submitting in response to the NSF 15-562 Program Solicitation. The Midwest BD Hub (MBDH) Collaboration will leverage activities and resources of current MBDH partners to build a sustainable framework to better coordinate existing projects and to initiate and launch numerous new partnerships. As a framework for developing and deeply linking collaborations, education, and services around data, MBDH will facilitate partnerships between diverse types of institutions (colleges and universities, including their libraries, non-profit organizations, foundations, national labs, companies, and local and state government agencies) in our region.

In July 2015, the University of Michigan (U-M) will launch a five-year Data Science Initiative by creating the Michigan Data Science Institute (MIDAS) and strengthening investments in Data Science Services and Infrastructure. MIDAS will be comprised of an interdisciplinary core faculty of ~40 data scientists (statistics and mathematics, computer science and engineering, information science and a range of data science intensive application experts). MIDAS will also include a Data Science Challenge Initiatives Program (Learning Analytics, Transportation, Social Sciences, Personalized Health), a Data Science Education and Training Program as well as an Industry Engagement Program.

As a member of the MIDAS leadership team, I participate on the Management Committee that provides oversight for the Institute's day-to-day activities. I also have responsibilities for the Transportation Challenge Initiative. These responsibilities are synergistic to my participation in the MBDH and the proposed *SEEDCorn* project.

I look forward to working with you and the *SEEDCorn* team to build new big data partnerships across the midwest region.

Sincerely,

H V Jagadish
Bernard A Galler Collegiate Professor of Electrical Engineering and Computer Science
University of Michigan

Diego Klabjan
Northwestern University
**Professor, Department of Industrial Engineering
and Management Sciences**
2145 Sheridan Road, Tech M239
Evanston, IL 60208
Tel: 847 491 0663
Email: d-klabjan@northwestern.edu
Director, Master of Science in Analytics

June 10, 2015

Re: Letter of Collaboration for Northwestern University

I am writing to express my commitment to the proposal about establishing a big data hub and to express my desire to collaborate on this effort.

As the founding and ongoing director of the Master of Science in Analytics program at Northwestern University I have abundant experience training students in analytics and data science. Each year the program graduates 32 students that undergo a rigorous curriculum in data science. The curriculum includes courses from database management and business intelligence to data mining, optimization, and machine learning. It also includes courses in big data analytics and a separate course in data visualization. Besides being the director of the program with the primary task of monitoring the curriculum (and originally putting it together), I also teach the big data analytics course.

I also have a very active Ph.D. research program advising 10 doctoral students on a regular basis and one or two post-doctoral students. The students conduct research in data science stretching from optimization to text analytics and big data algorithms. The research is mostly focused on developing new algorithms in optimization and machine learning. The motivation usually comes from either emerging computational platforms such as Hadoop or Spark or from a new business application, e.g., RFID sensors, social media.

If there are further questions, please do not hesitate to contact me by email or phone.

Sincerely,

Diego Klabjan
Professor

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

Wolfgang Kliemann
Office of the Vice President for Research
2610 Beardshear Hall
Ames, IA 50011-2036
515-294-6344
FAX 515-294-6100
Email: kliemann@iastate.edu

To: NSF Big Data Regional Innovation Hubs (BD Hubs) Program

From: Wolfgang Kliemann, Associate Vice President for Research

By signing below, I acknowledge that I am listed as a collaborator on this proposal, entitled "Midwest Big Data Hub (MBDH)", with Edward Seidel as the Principal Investigator. I agree to undertake the tasks assigned to me or my organization, as described in the project description of the proposal, and I commit to provide or make available the resources specified therein.

Signed

Organization: Iowa State University

Date: June 15, 2015

June 18, 2015

Professor Edward Seidel
Principal Investigator
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
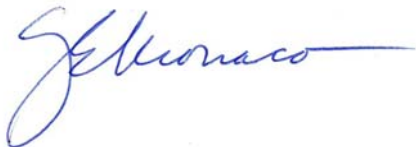1205 West Clark Street
Urbana, IL 61801

Re: Letter of Collaboration for Midwest Big Data Hub Proposal in response to NSF 15-562
Program Solicitation

Dear Ed,

I am pleased to provide this letter confirming my intent to collaborate in the *BD Hubs: Midwest: "SEEDCorn: Sustainable Enabling Environment for Data Collaboration"* proposal that you are submitting in response to the NSF 15-562 Program Solicitation. The Midwest BD Hub (MBDH) Collaboration will leverage activities and resources of current MBDH partners to build a sustainable framework to better coordinate existing projects and to initiate and launch numerous new partnerships. As a framework for developing and deeply linking collaborations, education, and services around data, MBDH will facilitate partnerships between diverse types of institutions (colleges and universities, including their libraries, non-profit organizations, foundations, national labs, companies, and local and state government agencies) in our region.

In July 2015, the University of Michigan (U-M) will launch a five-year Data Science Initiative by creating the Michigan Data Science Institute (MIDAS) and strengthening investments in Data Science Services and Infrastructure. MIDAS will be comprised of an interdisciplinary core faculty of ~40 data scientists (statistics and mathematics, computer science and engineering, information science and a range of data science intensive application experts). MIDAS will also include a Data Science Challenge Initiatives Program (Learning Analytics, Transportation, Social Sciences, Personalized Health), a Data Science Education and Training Program as well as an Industry Engagement Program.

As a member of the MIDAS Affiliate Faculty, I will participate in data science activities associated with the Institute and university more generally, with a focus on business analytics. This focus is synergistic with my participation in the MBDH and the proposed *SEEDCorn* project.

I look forward to working with you and the *SEEDCorn* team to build new big data partnerships across the midwest region.

Sincerely,

Jun Li, Ph.D.
Assistant Professor
Technology and Operations
Stephen M. Ross School of Business
University of Michigan

UNIVERSITY OF ILLINOIS
AT URBANA - CHAMPAIGN

Graduate School of Library and Information Science
501 East Daniel Street
Champaign, IL 61820-6211

National Center for Supercomputing Applications
1205 West Clark Street
Urbana, IL 61801

June 19, 2015

Dear Ed,

I am writing to confirm my intent to participate in the NSF Midwest Big Data Hub Innovation Hub (MBDH) team, led by UIUC, Iowa State University, the University of Michigan, Ann Arbor, Indiana University, and the University of North Dakota.

As the director of the Center for Informatics Research in Science & Scholarship (CIRSS) at the Illinois iSchool, and principal investigator on a number of relevant NSF awards (see Current & Pending), I commit to participating in the activities of the MBDH toward developing cross-cutting, synergistic activities between institutions, organizations, industrial partners and individuals, e.g., through the participation in conferences, workshops, and through developing partnerships between members. I authorize my name to be added as Senior Personnel on the grant proposal, and I look forward to participating in the activities of the Hub should the grant be awarded.

Sincerely,

Bertram Ludäscher

Dr. Bertram Ludäscher
Professor, Graduate School of Library and Information Science (GSLIS)
Director, Center for Informatics Research in Science & Scholarship (CIRSS)
Faculty Affiliate, NCSA and Department of Computer Science
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June 18, 2015

Dr. Edward Seidel
Principal Investigator
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
1205 West Clark Street
Urbana, IL 61801

Re: Letter of Collaboration for Midwest Big Data Hub

Dear Dr. Seidel,

It is my great pleasure to write this letter of collaboration and support for your application to establish a Midwest Big Data Regional Innovation Hub. Your proposed Hub has great potential for developing new partnerships in Big Data focused on key challenges in the Midwest Region. I am thus excited to serve as senior personnel on your application from Missouri University of Science and Technology, Rolla, MO.

I serve as the Site Director of the NSF I/UCRC on Net Centric and Cloud Systems and Software where we have industry support on various projects related to Big Data and Cloud Computing with respect to data security and management. The center would benefit from the Big Data Regional Innovation Hub that you propose to bring more partnerships. I also have a 3 years NSF grant on Big Data management for disaster applications to continue research in this area. My institution is committed to the success of the Hub and has supported my involvement in the Urban Planning and Smart City applications. They have expressed their willingness to continue their support, and I will be working to identify, contact, and engage potential partners in the State of Missouri. We also have Big Data certificates program which will benefit the educational component associated with Big Data Regional Innovation Hub. Our partners may benefit from the courses and educational materials that have been developed for these programs, and for access to the students who are participating in these programs.

In addition to industry partnerships, my Initiative and S & T are willing to collaborate in workshops to develop common interests and understanding of regional needs, participate in creating Big Data sharing policies and best practices, host guest lecturers and presenters to speak to regional audiences about Big Data.

We look forward to working with the proposed Midwest Big Data Regional Innovation Hub as a means for sharing our expertise and collaborating with others. We have other faculty who have expressed interest in the Hub and willingness to share expertise and resources for the benefit of new partnerships.

I wish you success with your application and look forward to continuing our collaborations for the success of the Hub. If you need any additional information, you can feel free to contact me by email, madrias@mst.edu.

Sincerely yours,

Sanjay K. Madria

Sanjay Madria, Professor and Associate Chair for Research
Site Director, NSF I/UCRC Center on Net-Centric System Software
Director, Web and Wireless Computing Lab

June 22, 2015

Dr. Edward Seidel
Principal Investigator
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
1205 West Clark Street
Urbana, IL 61801

RE: Letter of Collaboration for Midwest Big Data Hub

Dear Dr. Seidel,

This letter confirms my commitment to serve as senior personnel on the IU subcontract to the proposed National Science Foundation application, **BD Hubs: Midwest: "SEEDCorn: Sustainable Enabling Environment for Data Collaboration."** As Associate Dean for the IU Libraries and Deputy Director of the IU Data to Insight Center, I am able to identify and leverage resources that can facilitate the activities of Ring 1: Tools and Services and Ring 2: Data Science for the BD Hubs: Midwest proposal. In particular, the IU Libraries bring a long history of work in building and running enterprise-scale digital libraries and supporting data preservation, curation, and publishing. Additionally, we have a long-term partnership with the Office of the Vice-President for Information Technology and the IU UITS Research Technologies Division in working with long-lived digital collections as primary research resources. In my current role as the Deputy Director of the D2I Center I am actively involved in the NSF funded SEAD Project and the HathiTrust Research Center (HTRC) all of which have tools that would support Rings 1 and 2. I will also serve as a key liaison along with Sr. Personnel Rob Quick as representatives from the BD Hubs Midwest team to the IU UITS/Research Technologies Division to coordinate the use of the tools and services contributed by the IU campus cyberinfrastructure management team.

I look forward to participating in this exciting NSF initiative and to working with you and the other collaborators of the Midwest BD hub. If I can be of assistance in answering further questions concerning the *SEEDCorn* application, please do not hesitate to contact me.

Sincerely,

Robert H. McDonald
Associate Dean for Library Technologies
Deputy Director Data to Insight Center
Director Kuali OLE Community Development
Indiana University

June 18, 2015

Dr. Edward Seidel
Principal Investigator
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
1205 West Clark Street
Urbana, IL 61801

RE: Letter of Collaboration for Midwest Big Data Hub

Dear Dr. Seidel,

This letter confirms my commitment to serve as senior personnel on the IU subcontract to the proposed National Science Foundation application, **BD Hubs: Midwest: "SEEDCorn: Sustainable Enabling Environment for Data Collaboration."** I wear many hats at Indiana University: I am Founding Director of the Indiana University Center for Bioethics; Associate Dean and Professor of Bioethics, Indiana University School of Medicine; Director of the Bioethics and Subject Advocacy Program in the Indiana Clinical and Translational Sciences Institute; and a co-Director of the IU Center for Law Ethics and Applied Research in Health Information. Common to each of these responsibilities is a commitment to anticipate and address ethical, legal and social issues that arise at the intersection of science and society.

 In my 25 year career I have led research teams examining the ethics of health information technology, genomics, and health and science policy, led the ELSI program of the Human Genome Project and was Executive Director the National Bioethics Advisory Commission appointed by Bill Clinton. These titles and experiences have honed my interest in many areas, but I am particularly interested in addressing the ethical and policy issues that arise in the design, conduct, analysis, and dissemination of the big network data that is the focus of Spoke 6-Network Science. These issues are not only at the cutting edge of science and health, but they cry out for careful moral and regulatory assessments. I look forward to collaborating with the Midwest Big Data Regional Innovation Hub team and being part of this innovative NSF initiative.

Sincerely,

Eric M. Meslin, Ph.D.
Director, Indiana University Center for Bioethics
Associate Dean and Professor of Bioethics, Indiana University School of Medicine
Director, IU Center for Law, Ethics and Applied research in Health Information
Durecotr Bioethics and Subjct Advocacy Progam, Indiana Clinica and Translational Science Institute

June 12, 2015

Dr. Edward Seidel
Principal Investigator, Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
1205 West Clark Street
Urbana, IL 61801

Dear Ed,

I write this letter of collaboration and support for our application to establish a Midwest Big Data Regional Innovation Hub. The proposed Hub has great potential for developing new partnerships in Big Data focused on key challenges in the Midwest Region and I am pleased to be a member of the senior personnel for the project and to serve on the Steering Committee.

As you know, the Great Plains Network is a consortium of 25 universities, plus 7 state networks and the EROS Data Center (USGS). Twenty of our member universities are located in states covered by this project, including Kansas, Iowa, Minnesota, Missouri, Nebraska, South Dakota and Wisconsin. We provide network transport between our members and Internet2 and ESnet. We help to coordinate big data and high performance computing activities among our members as well as between our members and other regional and national organizations. We provide advanced training and outreach in topics such as data transport, data management and curation best practices, network optimization for data sharing and related topics through our professional development workshops and annual meeting.

Together with the Greater Western Library Alliance, GPN has formed a mini-hub known as DataFOUR (Data Federation Of University Research) that was originally funded by the Institute of Museum and Library Services and helps organize the joint GPN-GWLA consortial membership, culminating in a Big Data Summit held each Spring in Kansas City, MO.

GPN members have many programs in the areas of transportation, agriculture, health sciences, water resource management, advanced manufacturing and more that will benefit from the activities of the hub. GPN participation in the development and ongoing direction setting for the Midwest Hub will be vital to these programs and, ultimately, for the Midwest Hub. That is why GPN and our membership so strongly support my involvement in this project.

Best regards,

Gregory E. Monaco, Ph.D.

www.greatplains.net

William (Bill) Mitchell
Executive Director
bill@greatplains.net

Gregory E. Monaco, Ph.D.
Director for Research &
Cyberinfrastructure Initiatives
greg@greatplains.net

UNIVERSITY OF ILLINOIS
AT URBANA-CHAMPAIGN

Department of Computer Science

201 N. Goodwin
Urbana, IL 61801

June 23, 2015

Dr. Edward Seidel
Principal Investigator
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
1205 West Clark Street
Urbana, IL 61801

Re: Letter of Collaboration for Midwest Big Data Hub

Dr. Dr. Seidel,

This letter is to convey interest in collaboration with the Midwest Big Data Hub team and support the application to establish a Midwest Big Data Regional Innovation Hub. Your proposed Hub has great potential for developing new partnerships in Big Data focused on key data challenges in the Midwest Region. I am thus excited to serve as a senior personnel on your NSF proposal application from the University of Illinois, Urbana-Champaign (UIUC) location.

I serve as the Director of Coordinated Science Laboratory (CSL), which is an Interdisciplinary Research Unit in the College of Engineering at UIUC with concentration on computing, communication and control research areas. Big Data is one of the central themes for CSL with research projects ranging from Big Data mining algorithms, machine learning algorithms, to signal processing, cloud computing and networking, approximate computing, and other computational methods related to Big Data in domains such as health care, genomics, food-water-energy, smart cities, transportation, digital manufacturing and others. CSL brings together researchers from diverse cross-domain areas including engineering, sciences, and humanities to solve these major Big Data societal problems in smart cities, power grid, transportation, manufacturing, and health care. We in CSL have experiences in working on interdisciplinary projects. Examples are the SONIC center on approximate computing to assist Big Data applications, PCI (Parallel Computing Institute) on parallel algorithms, protocols, architectures and programming environments to assist Big Data applications, and CompGen Center on computational genomics algorithms to assist with machine learning algorithms, computer architectures, software, and hardware for real-time Big Data genomics analytics.

My own research is in real-time, ubiquitous and trustworthy data acquisition algorithms, and data transport, collection and aggregation protocols and frameworks for diverse cyber-physical systems such as energy, transportation, materials science, and health care.

I am looking forward to collaborate with the proposed Midwest Big Data Regional Innovation Hub team in creating Big Data sharing policies and best practices, to host guest lectures and presenters, and to speak to regional audiences about Big Data issues. I am also willing to provide connections between the Midwest Big Data Hub and computing organizations such as CCC (Computing Community Consortium), which is a subcommittee of CRA (Computing Research Association), and ACM, a professional computing association with many SIGs (Special Interest Groups), that have impact on the Big Data research community in academia, industry and government.

I wish you success with your grant application and look forward to continuing collaboration for the success of the Hub.

Best regards,

Klara Nahrstedt
Director of Coordinated Science Laboratory
Ralph and Catherine Fisher Professor
Department of Computer Science
University of Illinois at Urbana-Champaign

June 19, 2015

Edward Seidel
Director, National Center for Supercomputing Applications
University of Illinois at Urbana-Champaign

Dear Dr. Seidel:

On behalf of UI LABS, I am very pleased to express my intent to collaborate on the proposed Midwest Big Data Hub. To be called, "**SEEDCorn: Sustainable Enabling Environment for Data Collaboration,**" the hub will enable the Midwest region and nation to respond to the challenges and opportunities posed by big data, with a particular emphasis on interests and resources unique to the Midwest.

In my position as CEO of UI LABS, I recognize the critical need to build a sustainable framework to better coordinate existing projects and create a platform for launching new partnerships. I am excited to support SEEDCorn in its efforts to link collaborations, education and services around data. I believe in SEEDCorn's commitment to facilitating partnerships that ensure collaboration among diverse types of institutions (colleges and universities, non-profit organizations, foundations and national labs) to ensure a focus on addressing important problems and developing real-world, impactful solutions.

UI LABS focuses on complex technological challenges that, if overcome, will have the most significant and positive impact on society. We leverage locational advantages including access to and collaboration with top academic and research institutions, along with a unique partnership with the City of Chicago. This "smart cities" partnership includes a standing commitment regarding real world pilot deployment opportunities to accelerate implementations and advance our understandings from field deployments of urban infrastructure innovations. We also facilitate linkages with leading-edge private sector partners that enhance innovation, support deployment and testing, and drive scaling and impact.

Additionally, with a consortium of 100+ companies, universities, non-profits, and research labs, UI LABS leads the Digital Manufacturing and Design Innovation Institute in collaboration with the Department of Defense. DMDII creates a novel partnership between world-leading manufacturing experts and cutting-edge software companies to enable interoperability across the supply chain, develop enhanced digital capabilities to design and test new products, and reduce costs in manufacturing processes across multiple industries.

The SEEDCorn project has my strongest support. I believe the mission of the project is of critical importance to society at large. I look forward to working with the team upon funding of the project. Please do not hesitate to contact me to further discuss my interest and commitment to supporting this effort.

Sincerely,

Caralynn V. Nowinski, M.D.
Chief Executive Officer
Ph. (312) 927-3570

June 22, 2015

Dr. Edward Seidel
Principal Investigator
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
1205 West Clark Street
Urbana, IL 61801

RE: Letter of Collaboration for Midwest Big Data Hub

Dear Dr. Seidel,

This letter confirms my commitment to serve as senior personnel on the IU subcontract to the proposed National Science Foundation application, **BD Hubs: Midwest: "SEEDCorn: Sustainable Enabling Environment for Data Collaboration."**

As Director of Information Technology at the Indiana University Network Science Institute (IUNI), I bring expertise in the development and management of cyberinfrastructure services and computational systems and am enthusiastic to work with similarly engaged staff at the other Midwest hub institutions. My role on the IU subcontract includes facilitating engagement of IU personnel and resources and promoting the organization and sponsorship of workshops and host activities. These activities will foster and support the collaborative partnerships envisioned by the BD Hubs Governance Group.

I look forward to being part of this innovative NSF initiative and to working with you and the other collaborators of the Midwest BD hub.

Sincerely,

Valentin Pentchev
Director of Information Technology
Indiana University Network Science Institute

June 15, 2015

Dr. Edward Seidel
Principal Investigator
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
1205 West Clark Street
Urbana, IL 61801

RE: Letter of Collaboration for Midwest Big Data Hub

Dear Dr. Seidel,

This letter confirms my enthusiastic support for and my willingness to collaborate on the proposed National Science Foundation application, **BD Hubs: Midwest: "SEEDCorn: Sustainable Enabling Environment for Data Collaboration."** The plans for the Midwest site represent an exciting, innovative and important response to NSF's Big Data Regional Innovation Hubs Announcement - (BD Hubs, NSF 15-562). As a senior person, I see my role as bringing on and organizing in three distinct areas of the Midwest Hub – Spoke 6-Network Science; Spoke 2-Health Sciences, Life Sciences, Bioinformatics, Genomics; and Education & Training.

On Spoke 6, Network Science, I am able to bring the scientific talent and organizational foundation of the Indiana University Network Science Institute, a new 7 million dollar internally funded initiative to create a new style data-based scientific institute. As Lead 1, I have been able to bring on Network Science experts from across the Midwest. As a relatively new substantive and methodological area, we can build national strength in this promising area that has already documented breakthroughs in everything from understanding pandemic spread to the structure of national trade. Although more than a method, Network Science does bring a new set of analytic tools to data, has conquered the unique challenges of relational data, and has pioneered approaches to Big Data. This will be an important addition to the Data Sciences Ring of the Midwest BD Hub.

On Spoke 2, Health Sciences, Life Sciences, Bioinformatics, Genomics, Indiana University also brings expertise and unique data to the proposed project. Particularly in the areas of brain science and brain disorders (mental health, mental illness, Alzheimer's disease, substance use) as well as electronic health records (EHR) where Regenstrief Institute is a national and global leader.

Finally, Indiana University brings unique educational resources to this effort. With national leaders in legal issues of cybersecurity (Fred Cate, School of Law) and ethical issues in Big Data (Eric Meslin, School of Medicine), IU stands in an optimal position to provide workshops and instructional materials not only on Network Science but also on these issues.

I am excited that IU is in a leadership position on this important project. The NSF initiative is a forward thinking and critical resource for 21st century scientific progress. I look forward to working with you and the other collaborators of the Midwest BD Hub.

Best Wishes,

Bernice A. Pescosolido, Ph.D.
Distinguished Professor of Sociology
Co-Director, Indiana University Network Science Institute (IUNI)
Director, Indiana Consortium for Mental Health Services Research
Indiana University
1022 E. Third Street
Bloomington, IN 47405
Tel. (812) 855.3841
pescosol@indiana.edu

June 19, 2015

Dr. Edward Seidel
Principal Investigator
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
1205 West Clark Street
Urbana, IL 61801

RE: Letter of Collaboration for Midwest Big Data Hub

Dear Dr. Seidel,

This letter confirms my commitment to serve as senior personnel on the IU subcontract to the proposed National Science Foundation application, **BD Hubs: Midwest: "SEEDCorn: Sustainable Enabling Environment for Data Collaboration."** As the Manager of High Throughput Computing for the IU University Information Technology Services (UITS) Research Technologies Division, I am able to identify and leverage resources that can facilitate the activities of Ring 1: Tools and Services and Ring 2: Data Science for the BD Hubs: Midwest proposal. In particular, University Information Technology Services (UITS)-Research Technologies (RT) has a long history of supporting campus, national and international cyberinfrastructure services that will enable the collaborative partnerships envisioned by the BD Hubs Governance Group. This includes support of such computational systems as KARST, Big Red II, and JetStream and data systems such as DC-WAN, SDA, and RFS. I will also serve as a key liaison along with Sr. Personnel Robert McDonald as representatives from the BD Hubs Midwest team to the IU UITS/Research Technologies Division to coordinate the use of the tools and services contributed by the IU campus cyberinfrastructure management team.

I look forward to participating in this exciting NSF initiative and to working with you and the other collaborators of the Midwest BD hub. If I can be of assistance in answering further questions concerning the *SEEDCorn* application, please do not hesitate to contact me.

Sincerely,

Rob Quick
Manager High Throughput Computing
Operations Officer Open Science Grid
UITS-Research Technologies
Indiana University

Prof. Edward Seidel
Principal Investigator
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
1205 West Clark Street
Urbana, IL 61801

SUBJECT: Letter of Collaboration for Midwest Big Data Hub

I am delighted to write in support of the the NSF Midwest Big Data Innovation Hub (MBDH) team led by the University of Illinois at Urbana-Champaign, Iowa State University, the University of Michigan, Indiana University, and the University of North Dakota. The explosive growth of data, made possible by new tools, software and instrumentation in science, engineering, medicine, business and social interaction, is transforming how we see and understand our world. It brings an exciting set of opportunities and challenges, particularly as we consider how best to share data to create competitive intellectual and economic advantage, while concurrently ensuring the privacy of individuals, entities and institutions and securing the data itself. We must work together to build communities of shared purpose, create and manage rapidly growing data sets, and develop the tools and services needed to manage and access those data sets. For the University of Iowa, I am pleased to serve as our institutional lead and point of contact for the MDBH effort.

The success of our Big Data Hub will bring together the public and private sector in new partnerships, including industry, academia, state and local governments, national labs, foundations and non-profit organizations. Our collective strength derives from the unique resources each of us possesses. While we make no commitments of voluntary cost sharing (in compliance with the terms of the solicitation), the University of Iowa has significant resources that we believe will prove beneficial to the MBDH's success. This starts with the expertise and knowledge of our faculty, staff, and students – many of whom are already engaged in data analytics research and education, as well as community and private sector partnerships.

In addition, the University of Iowa has launched a major new, multidisciplinary hiring initiative in informatics (http://informatics.uiowa.edu). This activity builds on existing strengths in computer science, computer engineering, bioinformatics, and library and information science. It includes a specific focus in big data analytics and machine learning, with broad applicability to potential MBDH activities. Moreover, the university is investing in new infrastructure and facilities to host the faculty, staff and students associated with this informatics initiative, as a strategic institutional priority.

In addition to core informatics expertise and investments, the University of Iowa is home to several world-class research centers and institutes whose work depends deeply on managing and extracting insights from large-scale data. These include the Institute for Hydroscience and Engineering (IIHR,

http://www.iihr.uiowa.edu), which brings together faculty and student researchers, along with state partnerships, to understand and manage one of the world's great (and limited) resources – water. This work spans multidisciplinary computational models of the environment with distributed sensors for real-time capture and analysis of changing environmental conditions.

In addition, the University of Iowa is home to a renowned health affairs complex, whose research spans all aspects of human health. Major centers involved in big data include the Iowa Institute of Human Genetics (IIHG) and the Iowa Institute for Biomedical Imaging (IIBI). The latter is a collaborative partnership between engineering and medicine to apply leading edge techniques to diverse types of biomedical images. In addition to these and a host of other biomedical research centers, the University of Iowa Hospitals and Clinics conduct clinical trials and serve the state as the its only research and teaching hospital. In this environment, research studies often track the health of families and communities across multiple generations.

Iowa is also committed to training the next generation of technologists through a host of informatics-related undergraduate programs and interdisciplinary graduate programs in such diverse areas as bioinformatics and computational biology, geoinformatics, health informatics and information science. Our long-term success depends on a cadre of trained talent.

The university also has significant and relevant contacts with industry and other stakeholders that we intend to leverage to create and grow partnerships that will support the MBDH as well as benefit from the MBDH. Our UIPartners program engages small businesses across the state on IT needs, and our faculty members participate regularly in collaborative research with major manufacturers in the state such as Rockwell Collins and John Deere.

In summary, I fully expect a successful and dynamic big data hub will result in new discoveries, innovation, economic development and quality of life in the region and the nation. I look forward to being an integral member of the Midwest Big Data Innovation Hub should it be awarded to this team.

Sincerely,

Daniel A. Reed
Vice President for Research and Economic Development
University Computational Science and Bioinformatics Chair
Professor of Computer Science, Electrical and Computer Engineering, and Medicine

MICHIGAN STATE
U N I V E R S I T Y

Vallabh Sambamurthy
Eli Broad Professor and Chairperson
Telephone: (517) 432-2916
E-mail: sambamurthy@bus.msu.edu

June 12, 2015

Dr. Edward Seidel
Principal Investigator
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
1205 West Clark Street
Urbana, IL 61801

Re: Letter of Collaboration for Midwest Big Data Hub

Dear Dr. Seidel:

I am delighted to write this letter of collaboration and support for your application to establish a Midwest Big Data Regional Innovation Hub. The proposed hub will have great impact on research and practice around the development and utilization of Big Data in the Midwest Region.

I am associated with the leadership of programmatic and research center activities related to business analytics at the Broad College of Business at Michigan State University. We launched a Masters' program in Business Analytics three years ago with the intention of building the skills needed by firms in the region. The program has been very successful and one of its key aspects has been experiential learning, where students actively work on consulting projects for firms. The experiential learning has been solidified through partnerships with many of the leading firms in the Midwest and it has benefitted the firms in discovering the business potential of analytics in their value chain activities.

We have also recently launched a new Center for Business and Social Analytics, whose goal is to provide a multi-disciplinary platform for collaboration with industry on the advancement of research and practice. The Center is being built through industry partnerships as well as grantsmannship and is being positioned to advance the Broad College's recognition of business analytics as a strategic imperative. We are developing research projects and collaborations around supply chain analytics, sustainability, and health care informatics.

**Eli Broad
College of
Business**

Accounting &
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Michigan State University
North Business College
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632 Bogue Street
Room N270
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517-355-7486
Fax: 517-432-1101
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My institution is committed to the success of the Hub and has supported my involvement in the design and advancement of the Business Analytics spoke in the proposed Big Data Hub. I will be working to identify, contact, and engage potential partners both in the State of Michigan and the Midwest. We have existing partnerships in the areas of supply chain management, packaging, agriculture, and healthcare that would benefit from the Big Data Regional Innovation Hub that you propose.

In addition to industry partnerships, we are willing to collaborate in workshops to develop common interests and understanding of regional needs, participate in creating Big Data sharing policies and best practices, host guest lecturers and presenters to speak to regional audiences about Big Data, and participate in development of educational materials and opportunities.

Michigan State University and the Broad College have considerable strengths that are relevant to the spoke of Business Analytics; these strengths involve areas such as the top supply chain management program, emerging leadership in business analytics programs and research, and access to multidisciplinary expertise across the college and the university. We look forward to working with the proposed Midwest Big Data Regional Innovation Hub as a means for sharing our expertise and collaborating with other institutions.

I wish you success with your application and look forward to continuing our collaborations for the success of the Hub.

Vallabh Sambamurthy

June 18, 2015

Dr. Edward Seidel
Principal Investigator
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
1205 West Clark Street
Urbana, IL 61801

RE: Letter of Collaboration for Midwest Big Data Hub

Dear Dr. Seidel,

This letter confirms my commitment to serve as senior personnel on the IU subcontract to the proposed National Science Foundation application, ***BD Hubs: Midwest: "SEEDCorn: Sustainable Enabling Environment for Data Collaboration."***

As a collaborator I have a strong interest in providing input to advance the objectives of Spoke 6- Network Science and Spoke 2- Health Sciences, Life Sciences, Bioinformatics, Genomics. My current leadership position in the Indiana University Network Science Institute and as Director of the Indiana Alzheimer Disease Center and Director of the Indiana University Center for Neuroimaging allows me to draw on scientific talent, unique data, and an organizational foundation that has the potential to create synergistic partnerships with other Midwest hub collaborators and contribute to the establishment of a successful consortium.

I look forward to working with the Midwest Big Data Hub team and being part of this leading edge initiative.

Sincerely,

Andrew J. Saykin, PsyD, ABPP/ABCN
Raymond C. Beeler Professor of Radiology and Imaging Sciences
Professor of Medical and Molecular Genetics, Neurology and Psychiatry
Director, Indiana University Center for Neuroimaging
Director, Indiana Alzheimer Disease Center
Leadership Team, Indiana University Network Science Institute
Leader, ADNI Genetics Core
Editor-in-Chief, *Brain Imaging and Behavior*

IU Health Neuroscience Center | 355 West 16th Street, Indianapolis, IN 46202 | Tel: (317) 963-7501 Fax: (317) 963-7547 email: asaykin@iupui.edu

Indiana University – Purdue University Indianapolis

Edward Seidel
Director, National Center for Supercomputing Applications
University of Illinois at Urbana-Champaign

Dear Dr. Seidel:

This letter confirms my enthusiastic commitment to serve as *senior personnel* on the IU subcontract to the proposed National Science Foundation application, **BD Hubs: Midwest: "SEEDCorn: Sustainable Enabling Environment for Data Collaboration."**

My group has expertise in analysis of large networks with emphasis on the development and study of network-based epidemic models. For this reason we plan to contribute to the Spoke 6 - Network Science.

I look forward to working with you and your team!

Sincerely,

Dr. Caterina Scoglio
Professor
Department of Electrical and Computer Engineering
Kansas State University
2069 Rathbone Hall
Manhattan, Kansas 66506-5204
Tel: +785 532 4646
URL: http://ece.k-state.edu/people/faculty/scoglio/index.html

<u>To the courtesy attention:</u>

Dr. Edward Seidel,
Principal Investigator
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
1205 West Clark Street
Urbana, IL 61801

Re: Letter of Collaboration for Midwest Big Data Hub

Dear Dr. Seidel,

This letter is to confirm that I am committed to serve as a senior personnel on the proposed Midwest Big Data regional hub. As a collaborator I am highly interested in contributing to the hub's educational agenda, and in particular to the development of Big Data undergraduate education that will be suitable for the needs of teaching-oriented institutes of higher education.

I am interested in developing and applying high-impact practices leading to student engagement and hands-on learning. In particular, I am enthusiastic about research-based undergraduate education allowing students and instructors at teaching-oriented institutes to practice their ability to apply computational tools to solve real-world Big Data problems, with the participation of domain scientists. I am also interested in utilizing the hub to provide smaller institutes with access to resources they need to develop effective educational programs in Big Data.

Small institutes of higher education are normally underrepresented in initiatives such as the Midwest regional big data hub, but are responsible for the training of the majority of the IT workforce. My main goal is therefore to provide the insight of smaller universities to ensure the hub's resources and activities are of benefit to a large population of students.

Another goal of mine is to develop educational methodology relevant to increasing the participation of underrepresented minorities in STEM, where I will use the methodology I developed and experience I earned while working on my TIDES (Teaching to Increase Diversity and Equity in STEM) program.

I am looking forward to working with you and with the other collaborators of the Big Data hub.

Sincerely,

Lior Shamir

Lior Shamir
Dept. of Math. & Comp. Sci.,
Lawrence Tech University
21000 W Ten Mile Rd., Southfield, MI 48075
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UNIVERSITY OF MINNESOTA

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June 16th, 2015

TO: Dr. Edward Seidel

Principal Investigator

Midwest Big Data Regional Innovation Hub

Director, National Center for Supercomputing Applications

1205 West Clark Street

Urbana, IL 61801

SUBJECT: NSF proposal titled "BD Hubs: Midwest: "SEEDCorn: Sustainable Enabling Environment for Data Collaboration"

Dear Dr. Seidel,

It is a pleasure to provide this letter of collaboration and support for your application to establish a Midwest Big Data Regional Innovation Hub. Your proposed Hub has great potential for developing new partnerships in Big Data focused on key challenges in the Midwest Region.

I am a professor of Computer Science at the University of Minnesota and the director of the Spatial Databases and Spatial Data Mining research laboratory. I am serving as the principal investigator of a NSF grant titled "Investigating Spatial Big Data for Next Generation Routing Services" with research activities in the area of spatial and spatio-temporal big data arising from connected vehicles and transportation. For example, via the Center for Transportation Studies at the University of Minnesota, we are collaborating with the Metro Transit, the public transportation authority in Twin Cities, to collect and support datasets using data logger systems in 300 buses in its fleet. Data logging devices collect data from the vehicle engine control units (ECU). Recorded parameters in the dataset has 1 Hz resolution consisting of around 130 columns including time, GPS location, speed, ambient conditions, emissions, engine operating parameters, transmission state, and vehicle loading.

University of Minnesota has a rich collection of research and educational initiatives in the area of big data. The interdisciplinary MS in Data Science program (datascience.umn.edu) in the University of Minnesota provides a strong foundation in the science of Big Data and its analysis by gathering in a single program the knowledge, expertise, and educational assets in data collection and management, data analytics, scalable data-driven pattern discovery, and the fundamental concepts behind these methods. I serve on the graduate faculty of MS in Data Science program.

The Minnesota Population Center (www.pop.umn.edu) is a leading developer and disseminator of demographic data from numerous countries over several decades is serving over 60,000 demographic researchers worldwide. Members of MPC share a commitment to cross-disciplinary research and a focus on the analysis of demographic behavior across time and space and

much of their work involves large-scale data analysis and policy-relevant research. Notable datasets include the IPUMS-USA: (harmonized microdata from US Census and American Community Survey from 1850), the IPUMS-CPS (harmonized Current Population Survey March files from 1962), and the NHGIS: (tabular U.S. census data and GIS boundary files from 1790 to 2000). It is also home to a NSF Datanet project, Terra Populus (www.terrapop.org), which is integrating data on population and environment. I am a co-PI of the Terra Populus project.
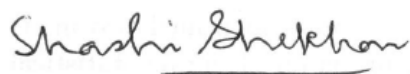
The Minnesota Supercomputing Institute (www.msi.umn.edu/) provides access to high-performance computing resources and user support to facilitate successful and cutting-edge research in all disciplines, contribute to undergraduate and graduate education, and benefit the broader community. MSI facilitates interdisciplinary research by providing big compute resources and user support. Representative compute resources include HP Supercomputer "Mesabi" with 16,848 compute cores (702 nodes with Intel Haswell E5-2680v3) and a 67TB of total memory, "Itasca" with 1,134 nodes and a total of 2,186 Intel Xeon X5560 processors and 31.3 TB main memory, Hadoop Clusters with 39 nodes with Intel E5-2620 processors and 8GB memory on each node, and "Cascade" with GPGPU nodes. Software includes but not limited to Octave, MatLab, R, SAS, CUDA, etc. MSI is committed to facilitating University-industry collaboration and to promoting technology transfer and has considerable experience in managing Big Data. I am a fellow of the Minnesota Supercomputing Institute.

I am thus excited to serve as key personnel on the mid-west big data hub proposal to the NSF. We are committed to the success of the Hub and we will be working to identify, contact, and engage potential partners in Minnesota. In addition, we are willing to collaborate in workshops to develop common interests and understanding of regional needs, participate in creating Big Data sharing policies and best practices, host guest lecturers and presenters to speak to regional audiences about Big Data, and participate in development of educational materials and opportunities. Our partners may benefit from the M.S. in Data Science program including the courses and educational materials that have been developed for this program, and access to the students who are participating in these programs.

I wish you success with your application and look forward to working with the proposed Midwest Big Data Regional Innovation Hub as a means for sharing our expertise and collaborating with other institutions to address critical Big Data challenges.

Please do not hesitate to contact me if there are any questions.

Sincerely,

Shashi Shekhar

(Prof. Shashi Shekhar)
McKnight Distinguished University Professor
University of Minnesota

June 18, 2015

Professor Edward Seidel
Principal Investigator
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
1205 West Clark Street
Urbana, IL 61801

Re: Letter of Collaboration for Midwest Big Data Hub Proposal in response to NSF 15-562 Program Solicitation

Dear Ed,
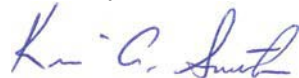
I am pleased to provide this letter confirming my intent to participate in the *BD Hubs: Midwest: "SEEDCorn: Sustainable Enabling Environment for Data Collaboration"* proposal that you are submitting in response to the NSF 15-562 Program Solicitation. The Midwest BD Hub (MBDH) Collaboration will leverage activities and resources of current MBDH partners to build a sustainable framework to better coordinate existing projects and to initiate and launch numerous new partnerships. As a framework for developing and deeply linking collaborations, education, and services around data, MBDH will facilitate partnerships between diverse types of institutions (colleges and universities, including their libraries, non-profit organizations, foundations, national labs, companies, and local and state government agencies) in our region.

In July 2015, the University of Michigan (U-M) will launch a five-year Data Science Initiative by creating the Michigan Data Science Institute (MIDAS) and strengthening investments in Data Science Services and Infrastructure. MIDAS will be comprised of an interdisciplinary core faculty of ~40 data scientists (statistics and mathematics, computer science and engineering, information science and a range of data science intensive application experts). MIDAS will also include a Data Science Challenge Initiatives Program (Learning Analytics, Transportation, Social Sciences, Personalized Health), a Data Science Education and Training Program as well as an Industry Engagement Program.

I have been an active participant in planning the Michigan Institute for Data Science and will have a leadership role in the Institute when it launches in July. I will work with Dr. Athey, MIDAS Co-Director, to ensure that MIDAS will actively engage in all MBDH activities.

I look forward to working with you and the *SEEDCorn* team to build new big data partnerships across the midwest region.

Sincerely,

Kevin A. Smith, M.S.
Director, Department of Computational Medicine & Bioinformatics
University of Michigan Medical School

INDIANA UNIVERSITY
NETWORK SCIENCE INSTITUTE

June 15, 2015

Dr. Edward Seidel
Principal Investigator
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
1205 West Clark Street
Urbana, IL 61801

RE: Letter of Collaboration for Midwest Big Data Hub

Dear Dr. Seidel,

This letter confirms my commitment to serve as senior personnel on the IU subcontract to the proposed National Science Foundation application, **BD Hubs: Midwest: "SEEDCorn: Sustainable Enabling Environment for Data Collaboration."** As Co-Director of the Indiana University Network Science Institute (IUNI), I am able to identify and leverage IUNI resources that can facilitate the activities of Spoke 6 – Network Science and Spoke 2 -- Health Sciences, Life Sciences, Bioinformatics, Genomics, as well as the Education & Training component. With a budget of 7 million over the next three years, IUNI is optimally positioned to provide the organizational and fiscal foundation for administrative support of a regional consortium. In particular, IUNI has the organizational capacity to provide workshops and instructional materials not only on Network Science methods, analytic techniques and visualizations, but also on issues of cybersecurity, data privacy, and bioethics.

I look forward to participating in this exciting NSF initiative and to working with you and the other collaborators of the Midwest BD hub.

Sincerely,

Olaf Sporns, Ph.D.
Distinguished Professor, Psychological & Brain Sciences
Co-Director, Indiana University Network Science Institute

National Center for Supercomputing Applications
1008 NCSA Building
1205 West Clark Street
Urbana, IL 61801

June 24, 2015

Dr. Edward Seidel
Principal Investigator
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
1205 West Clark Street
Urbana, IL 61801

Dear Dr. Seidel:

It is with great enthusiasm that I write to express my commitment to the project titled *BD Hubs: Midwest: "SEEDCorn: Sustainable Enabling Environment for Data Collaboration" that you are submitting in response to NSF's "Big Data Regional Innovation Hubs (BD Hubs): Accelerating the Big Data Innovation Ecosystem" (NSF 15-562)*. Data science and services are critical to the future of the nation and national infrastructures such as XSEDE and the National Data Service (NDS), to the university, and to NCSA. NCSA spearheaded the National Data Service Consortium last year, is home to the Blue Waters and XSEDE projects.

With this context, as detailed below, *I write in four capacities: (a) as Executive Director of Science & Technology at NCSA, (b) as the interim Director of the National Data Service, and (c) as the PI and Project Director of XSEDE, as they relate to (d) the capacity of Senior Personnel (SP) to be involved personally in the project.*

As Executive Director, Science & Technology at NCSA, I am pleased to support the commitments of the organization to work in numerous ways to support the goals of the project; these are summarized in the letter provided by Ed Seidel and are not recounted here.

As interim Director of the National Data Service, I am pleased to support the commitments of the NDS to *SEEDCorn* as outlined in my letter regarding this. In brief, this includes providing full access the NDS Labs environment for development and access to the NDS Share environment for the developed tools and services to be transitioned into for prediction use by the community.

As PI and Project Director of XSEDE, I am pleased to support the commitments of XSEDE to *SEEDCorn* as outlined in my letter regarding this. In brief, this includes assisting this project through the process of federating with XSEDE and in supporting research teams leveraging your services and XSEDE resources with staff from our Extended Collaborative Support Service (ECSS).

As SP in the project, I commit to work specifically with the various cyberinfrastructure providers nationally and internationally including the National Data Service, XSEDE, and partners of those organization such as Open Science Grid, EUdat, the Australian National Data Service, Compute Canada and Research Data Canada. In addition, I will work too in my capacity as a participant in the Research Data Alliance to foster collaborative relationships.

Sincerely,

John Towns
Interim Director, National Data Service
PI and Project Director, XSEDE
Executive Director, Science & Technology
National Center for Supercomputing Applications
University of Illinois

Matthew Turk
National Center for Supercomputing Applications
1008 NCSA Building
1205 West Clark Street
Urbana, IL 61801

June 19, 2015

Dear Prof. Seidel,

I am writing to confirm my intent to participate in the Midwest Big Data Hub (MBDH) initiative team led by you at the University of Illinois at Urbana-Champaign. I am a Research Scientist at the National Center for Supercomputing Applications with a background in astronomy, data analysis, and data visualization.

As a technical lead in the NDS Labs initiative and a member of the National Data Service Consortium, as well as a researcher at the University of Illinois in data-related activities and scholarship, I commit to participating in the activities of the MBDH toward developing cross-cutting, synergistic activities between institutions, organizations, industrial partners and individuals; this includes conferences, workshops, and developing partnerships between members. I authorize my name to be added as Senior Personnel on the grant proposal, and I look forward to participating in the activities of the Hub should the grant be awarded.

Sincerely,

Matthew Turk
Research Scientist, NCSA
Research Assistant Professor, Astronomy

Department of Geography and
Geographic Information Science

Computing Applications Building, Second Floor
605 East Springfield Avenue, MC 150
Champaign, Illinois 61820

June 14, 2015

Edward Seidel
Director, National Center for Supercomputing Applications (NCSA)
University of Illinois at Urbana-Champaign

Dear Dr. Seidel:

It is with great enthusiasm that I write to express my intent to collaborate on the project titled:
"*BD Hubs: Midwest: SEEDCorn: Sustainable Enabling Environment for Data Collaboration*"
that you are submitting in response to NSF's Big Data Regional Innovation Hubs - (BD Hubs, NSF 15-562). The BD Hubs project proposes to establish a critical and innovative big data infrastructure for achieving transformative progress on broad data- and compute-intensive sciences.

The collaboration will have my strong commitment to contribute to research and development of geospatial big data capabilities and associated geospatial science drivers.

I look forward to working with you and your team!

Sincerely,

Shaowen Wang, Ph.D.
Professor, *Department of Geography and Geographic Information Science (Primary);*
        Department of Computer Science; Department of Urban and Regional Planning; and
        Graduate School of Library and Information Science
Centennial Scholar, *College of Liberal Arts and Sciences*
Founding Director, *CyberGIS Center for Advanced Digital and Spatial Studies;*
        CyberInfrastructure and Geospatial Information Laboratory
Associate Director *for CyberGIS* and Interim Lead *of Earth & Environment Theme*, *NCSA*

Scott Wilkin
National Center for Supercomputing Applications
1008 NCSA Building
1205 West Clark Street
Urbana, IL 61801

June 19, 2015

Dear Prof. Seidel,

I am writing to confirm my intent to participate in the Midwest Big Data Hub (MBDH) initiative team led by you at the University of Illinois at Urbana-Champaign. I am the New Business Development Director at the National Center for Supercomputing Applications with a background in driving large corporate projects.

I commit to participating in the activities of the MBDH toward developing cross-cutting, synergistic activities between institutions, organizations, industrial partners and individuals; this includes conferences, workshops, and developing partnerships between members. I authorize my name to be added as Senior Personnel on the grant proposal, and I look forward to participating in the activities of the Hub should the grant be awarded.

Sincerely,

Scott Wilkin
Associate Director, NCSA

UNIVERSITY OF ILLINOIS
AT URBANA - CHAMPAIGN

National Center for Supercomputing Applications
1008 NCSA Building
1205 West Clark Street
Urbana, IL 61801

June 15, 2015

Dr. Edward Seidel
Principal Investigator
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
1205 West Clark Street, Urbana, IL 61801

Re: Letter of Collaboration for Midwest Big Data Hub

Dear Dr. Seidel,

Your proposed Innovation Hub has great potential to harness the tsunami of Big Data for academic research and for our Midwest Region. With this letter of collaboration and support, I am happy to participate and contribute whatever I could to the success of the Midwest Big Data Regional Innovation Hub.

With Professor Scott Poole, I work on NSF-supported GroupScope audiovisual analysis of people interactions and ARL-supported multi-team performance experimentation. With a larger team or teams of collaborators needed to carry out scientific research, communication and teamwork analysis with Network Science perspective could play a beneficial role in assisting team performance. In addition to being an analytic and explanatory method, Network Science investigates natural phenomena of the interconnectedness of things. The interrelatedness phenomena in Big Data are studied in Data Sciences but Network Science can bring a new perspective. Network Science depends on a unique set of data that is relational. It is however a relatively young field and so I connected with University of Indiana's Network Science Institute http://iuni.iu.edu —and Spoke 6 Network Science and its ring in Data Sciences.

Our research team here at NCSA has existing working relationships with BBN-Raytheon and ARL. ARL has funded a research program in Network Science, the Network Science Collaborative Technology Alliance http://www.ns-cta.org/ns-cta-blog. The program has run for 5 years and contributed to the advance of the Network Science field. Some of the research results are potentially transferrable to Midwest Big Data Hub in which network phenomena in the Hub--and in Midwest communities in which the Hub lives--can be studied. Network Science investigation results will be of interest to "Social Network" Internet companies such as local Yahoo! in Champaign and LinkedIn for enhancing Midwest local professional networks.

I wish you success with your Innovation Hub application.

Sincerely,

Alex Yahja, Ph.D.
National Center for Supercomputing Applications
1205 West Clark St., Urbana, IL 61801
alexy@uiuc.edu

June 2, 2015

Michael J. Fry, Ph.D.
Professor and Department Head, Operations, Business Analytics and Information Systems
Interim Director, Center for Business Analytics
University of Cincinnati
Cincinnati, OH 45221

RE: Letter of Collaboration for Midwest Big Data Hub

Dear Professor Fry,

84.51° is pleased to provide this letter confirming our commitment to collaborate with the proposed Midwest Big Data Innovation Hub (MBDH) team.   Our company/organization is extremely interested in working with the universities driving this valuable effort to establish a cross-cutting Big Data Hub focused on key Big Data challenges and opportunities for the region.

84.51° was founded on one simple principle: Put the customer at the center of every business decision. It enriches peoples' lives and builds sustainable growth for our partners. The 84.51° team is fanatically devoted to helping our partners—leading CPG manufacturers and retailers—develop, nurture and embrace customer-driven relationships. By using a sophisticated suite of tools and technology, our fearless people navigate the complex data landscape to reveal relevant customer patterns. We find big opportunity by exploring the smallest of details.

With the hub and spoke design of this Big Data effort, 84.51° has a strong interest in the domain of business analytics. We employ hundreds of people with years of experience navigating the challenge of Big Data and applied customer-based analytics. We will work with the MBDH leadership team to add our expertise in the spokes that most closely align with our business interests.
The success of such a Big Data Hub will depend on new collaborations being established between the private and public sectors, including industry, academia, state and local governments, national labs,

84.51°

100 W. 5th Street
Cincinnati, OH 45202
8451.com

foundations and non-profit organizations. Our company recognizes this and looks forward to leveraging our expertise, established collaborative programs and capabilities to complement and inform the MBDH's activities. We believe we can collaborate in the following manner:

- As warranted and consistent with company policies, providing access to large data sets under terms and conditions that will allow us to protect our interests and that of our stakeholders and yet, as part of a cross-hub effort, create the potential for new knowledge and opportunities of interest
- Participate in creating Big Data sharing policies, Big Data licensing guidelines and the development of Big Data best practices at the spoke, hub and national level
- As warranted and optimal, providing guest lecturers and presenters to seminar series and classes to share our expertise, as well as continue to mentor student interns
- If applicable, hosting center researchers and students for extended stays and intellectual exchanges to explore mutually beneficial topics to advance Big Data capabilities
- Support private start-up companies in the Big Data space by hosting them in our facilities and providing expert mentorship
- Sharing of employee expertise (data, information, and knowledge) as appropriate and consistent with our company's policies.

We are enthusiastic about collaborating with the Midwest Big Data Regional Innovation Hub team and being part of this novel forward-looking national initiative. We look forward to being invited, being part of the partnerships, and providing input in order to establish a successful hub for our home region.

Sincerely,

Stuart Aitken
CEO

84.51°
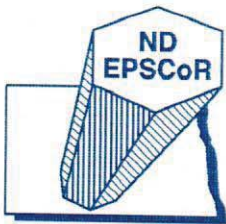
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June 21, 2015

Dr. Edward Seidel
Principal Investigator
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
1205 West Clark Street
Urbana, IL 61801

Re: Letter of Collaboration for Midwest Big Data Hub

Dear Dr. Seidel,

The North Dakota EPSCoR (Experimental Program to Stimulate Competitive Research) at the University of North Dakota is pleased to provide this letter confirming our commitment to collaborate with the proposed Midwest Big Data Innovation Hub (MBDH) team. Our office is extremely interested in working with other universities driving this valuable effort to establish a cross-cutting Big Data Hub focused on key Big Data challenges and opportunities for the region. In addition to supporting the two research themes in our current NSF Track-1 grant, which I understand are keenly interested in the success of the Big Data Hub, my office will help support planned workshops / conferences involving Big Data on the UND campus.

In the hub and spoke design of this effort our office has a strong interest in several of the domains below, but will work with the leadership team to add our expertise in the spokes that most closely align with all of our interests.

- Water-energy-food nexus
- Health sciences, Life sciences, Bioinformatics, Genomics
- Digital agriculture (precision farming, phenomics, remote/sensing, sustainability)
- Advanced manufacturing
- Transportation

The success of such a Big Data Hub will depend on new collaborations being established between the private and public sectors, including industry, academia, state and local governments, national labs, foundations and non-profit organizations. Our office

recognizes this and looks forward to leveraging our expertise, established collaborative programs and capabilities to complement and inform the MBDH's activities. We believe we can collaborate in the following manner:

- Taking part in and sponsoring, as resources allow, workshops to develop a common understanding of regional Big Data needs for spokes of interest to us with an emphasis on data sharing and access requirements, workforce development and professional training requirements.
- As warranted and optimal, encouraging faculty to be guest lecturers and presenters to seminar series and classes as well as mentors to student interns
- Taking part in the refinement of collaboration plans and initiatives that will bring value to participants and lead to the longer-term sustainability of the regional Hub.

We are enthusiastic about collaborating with the Midwest Big Data Regional Innovation Hub team and being part of this novel forward-looking national initiative. We look forward to being invited and be part of the partnerships, and provide input in order to establish a successful hub.

Sincerely,

Mark R. Hoffmann
Chester Fritz Distinguished Professor
Associate Vice President for Research Capacity Building
Associate Project Director, ND EPSCoR
mark.hoffmann@email.und.edu
701-777-2492

Date: June 22 , 2015

Dr. Edward Seidel
Principal Investigator
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
1205 West Clark Street
Urbana, IL 61801

Re: Letter of Collaboration for Midwest Big Data Hub

Dear Dr. Seidel,

The Center for Regional Climate Studies (CRCS) is pleased to provide this letter confirming
our commitment to collaborate with the proposed Midwest Big Data Innovation Hub (MBDH)
team. CRCS is extremely interested in working with the universities driving this valuable effort
to establish a cross-cutting Big Data Hub focused on key Big Data challenges and
opportunities for the region. In the hub and spoke design of this effort our center has a strong
interest in Digital agriculture (precision farming, phenomics, remote/sensing, sustainability).

The success of such a Big Data Hub will depend on new collaborations being established
between the private and public sectors, including industry, academia, state and local
governments, national labs, foundations and non-profit organizations. Our center recognizes
this and looks forward to leveraging our expertise, established collaborative programs and
capabilities to complement and inform the MBDH's activities. We believe we can collaborate
in the following manner:

- Taking part, as resources allow, in workshops to develop a common understanding of
  regional Big Data needs for spokes of interest to us with an emphasis on data sharing
  and access requirements, workforce development and professional training
  requirements.
- Taking part in the refinement of collaboration plans and initiatives that will bring value
  to participants and lead to the longer-term sustainability of the regional Hub.

We are enthusiastic about collaborating with the Midwest Big Data Regional Innovation Hub
team and being part of this novel forward-looking national initiative. We look forward to being
invited and be part of the partnerships, and provide input in order to establish a successful hub.

Sincerely,

Associate Professor
Department of Atmospheric Sciences
John D. Odegard School of Aerospace Sciences
Clifford Hall Room 412
4149 University Avenue Stop 9006
Grand Forks, ND 58202-9006
701/777-6342 • FAX 701/777-5032

Jianglong Zhang,
CRCS director & Associate Professor

Associate Professor
Department of Atmospheric Sciences
John D. Odegard School of Aerospace Sciences
Clifford Hall Room 412
4149 University Avenue Stop 9006
Grand Forks, ND 58202-9006
701/777-6342 • FAX 701/777-5032

AGRIBLE

5/19/2015

Dr. Edward Seidel
Principal Investigator
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
1205 West Clark Street
Urbana, IL 61801

Re: Letter of Collaboration for Midwest Big Data Hub

Dear Dr. Seidel,

Company/Organization ABC is pleased to provide this letter confirming our commitment to collaborate with the proposed Midwest Big Data Innovation Hub (MBDH) team. Our company/organization is extremely interested in working with the universities driving this valuable effort to establish a cross-cutting Big Data Hub focused on key Big Data challenges and opportunities for the region.

In the hub and spoke design of this effort our company has a strong interest in several of the domains below, but will work with the leadership team to add our expertise in the spokes that most closely align with our business interests.

- Water-energy-food nexus
- Digital agriculture (precision farming, phenomics, remote/sensing, sustainability)
- Business analytics

The success of such a Big Data Hub will depend on new collaborations being established between the private and public sectors, including industry, academia, state and local governments, national labs, foundations and non-profit organizations. Our company recognizes this and looks forward to leveraging our expertise, established collaborative programs and capabilities to complement and inform the MBDH's activities. We believe we can collaborate in the following manner:

- Taking part, as resources allow, in workshops to develop a common understanding of regional Big Data needs for spokes of interest to us with an emphasis on data sharing and access requirements, workforce development and professional training requirements.
- Participate in creating Big Data sharing policies, Big Data licensing policies and guidelines and the development of Big Data best practices at the spoke, hub and national level
- As warranted and optimal, providing guest lecturers and presenters to seminar series and classes as well as mentors to student interns

60 Hazelwood Dr. Ste 230D I Champaign, Illinois 61820 I www.agrible.com

- As warranted and consistent with company policies, providing access to large data sets under terms and conditions that will allow us to protect our interests and that of our stakeholders and yet, as part of a cross-hub effort, create the potential for new knowledge and opportunities of interest
- Sharing of employee expertise (data, information, and knowledge) as appropriate and consistent with our company's policies.
- Taking part in the refinement of collaboration plans and initiatives that will bring value to participants and lead to the longer-term sustainability of the regional Hub.

We are enthusiastic about collaborating with the Midwest Big Data Regional Innovation Hub team and being part of this novel forward-looking national initiative. We look forward to being invited and be part of the partnerships, and provide input in order to establish a successful hub.

Sincerely,

Christopher M. Harbourt, Ph.D.
Co-Founder and CEO
Chris@agrible.com
(217)-840-8199

Alcatel·Lucent (logo)

June 2, 2015

Dr. Edward Seidel
Principal Investigator
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
1205 West Clark Street
Urbana, IL 61801

Re: Letter of Collaboration for Midwest Big Data Hub

Dear Dr. Seidel,

Alcatel-Lucent is pleased to provide this letter confirming our commitment to collaborate with the proposed Midwest Big Data Innovation Hub (MBDH) team. Our company/organization is extremely interested in working with the universities driving this valuable effort to establish a cross-cutting Big Data Hub focused on key Big Data challenges and opportunities for the region.

In the hub and spoke design of this effort Alcatel-Lucent has a strong interest in several of the domains below, but will work with the leadership team to add our expertise in the spokes that most closely align with our business interests:

- Advanced manufacturing
- Business analytics

The success of such a Big Data Hub will depend on new collaborations being established between the private and public sectors, including industry, academia, state and local governments, national labs, foundations and non-profit organizations. Alcatel-Lucent recognizes this and looks forward to leveraging our expertise, established collaborative programs and capabilities to complement and inform the MBDH's activities. We believe we can collaborate in the following manner:

- Taking part, as resources allow, in workshops to develop a common understanding of regional Big Data needs for spokes of interest to us with an emphasis on data sharing and access requirements, workforce development and professional training requirements.
- Participate in creating Big Data sharing policies, Big Data licensing policies and guidelines and the development of Big Data best practices at the spoke, hub and national level

- Sharing of employee expertise (data, information, and knowledge) as appropriate and consistent with our company's policies.

We are enthusiastic about collaborating with the Midwest Big Data Regional Innovation Hub team and being part of this novel forward-looking national initiative. We look forward to being invited and be part of the partnerships, and provide input in order to establish a successful hub.

Sincerely,

Paul Baniewicz
Vice President Optical Business Development
Paul.Baniewicz@alcatel-lucent.com
972-567-7440(cell)

CATERPILLAR®

Caterpillar Inc.

Champaign Simulation Center
1901 S. First Street
Champaign, Illinois 61820 USA
(217) 255-8500
Fax (217) 255-8505

June 15, 2015

Dr. Edward Seidel
Principal Investigator
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
1205 West Clark Street
Urbana, IL 61801

Re: Letter of Collaboration for Midwest Big Data Hub

Dear Dr. Seidel,

Caterpillar is pleased to provide this letter confirming our commitment to collaborate with the proposed Midwest Big Data Innovation Hub (MBDH) team. Caterpillar is extremely interested in working with the universities driving this valuable effort to establish a cross-cutting Big Data Hub focused on key Big Data challenges and opportunities for the region.

In the hub and spoke design of this effort our company has a strong interest in several of the domains below, but will work with the leadership team to add our expertise in the spokes that most closely align with our business interests.

- Internet of Things (How to integrate big data from multiple sources)
- Analytics for Product Development (Telematics, Digital Manufacturing, etc)
- Digital agriculture (precision farming, phenomics, remote/sensing, sustainability)
- Advanced manufacturing
- Network science
- Transportation
- Business analytics

The success of such a Big Data Hub will depend on new collaborations being established between the private and public sectors, including industry, academia, state and local governments, national labs, foundations and non-profit organizations. Our company recognizes this and looks forward to leveraging our expertise, established collaborative programs and capabilities to complement and inform the MBDH's activities. We believe we can collaborate in the following manner:

- Taking part, as resources allow, in workshops to develop a common understanding of regional Big Data needs for spokes of interest to us with an emphasis on data sharing and access requirements, workforce development and professional training requirements.
- Participate in creating Big Data sharing policies, Big Data licensing policies and

guidelines and the development of Big Data best practices at the spoke, hub and national level

• As warranted and optimal, providing guest lecturers and presenters to seminar series and classes as well as mentors to student interns
• As warranted and consistent with company policies, providing access to large data sets under terms and conditions that will allow us to protect our interests and that of our stakeholders and yet, as part of a cross-hub effort, create the potential for new knowledge and opportunities of interest
• If applicable, hosting center researchers and students for extended stays and intellectual exchanges
• Sharing of employee expertise (data, information, and knowledge) as appropriate and consistent with our company's policies.
• Taking part in the refinement of collaboration plans and initiatives that will bring value to participants and lead to the longer-term sustainability of the regional Hub.

We are enthusiastic about collaborating with the Midwest Big Data Regional Innovation Hub team and being part of this novel forward-looking national initiative. We look forward to being invited and be part of the partnerships, and provide input in order to establish a successful hub.

Sincerely,

Chaille Becker
Analytics Division Manager
Caterpillar Inc.
309-494-5995
becker_chaille_j@cat.com

June 15, 2015

Charlie Catlett
Director, Urban Center for Computation and Data
Computation Institute
The University of Chicago and Argonne National Laboratory
5735 S. Ellis Avenue
Chicago, IL 60637

Re: Letter of Collaboration for Midwest Big Data Hub

Dear Mr. Catlett

The City of Chicago Department of Innovation & Technology is pleased to provide this letter confirming our commitment to collaborate with the proposed Midwest Big Data Innovation Hub (MBDH) team. Our department and city-wide Advanced Analytics Program is extremely interested in working with the universities driving this valuable effort to establish a cross-cutting Big Data Hub focused on key Big Data challenges and opportunities for the region.

In the hub and spoke design of this effort our City has a strong interest in several of the domains below, but will work with the leadership team to add our expertise in the spokes that most closely align with our residents' needs.

- Water-energy-resource nexus
- Urban science/Smart cities
- Advanced manufacturing
- Transportation
- Business analytics

The success of such a Big Data Hub will depend on new collaborations being established between the private and public sectors, including industry, academia, state and local governments, national labs, foundations and non-profit organizations. Chicago recognizes this and looks forward to leveraging our expertise, established collaborative programs and capabilities to complement and inform the MBDH's activities. We believe we can collaborate in the following manner:

- Taking part, as resources allow, in workshops to develop a common understanding of regional Big Data needs for spokes of interest to us with an emphasis on data sharing and access requirements, workforce development and professional training requirements.
- Participate in creating Big Data sharing policies, Big Data licensing policies and guidelines and the development of Big Data best practices at the spoke, hub and national level.
- As warranted and optimal, providing guest lecturers and presenters to seminar series and classes as well as mentors to student interns.
- As warranted and consistent with City policies, providing access to large data sets under terms and conditions that will allow us to protect our interests and that of our stakeholders and yet, as part of a cross-hub effort, create the potential for new knowledge and opportunities of interest. This point is specifically supported by the City's extensive open data portal.
- If applicable, hosting center researchers and students for extended stays and intellectual exchanges.
- Sharing of employee expertise (data, information, and knowledge) as appropriate and consistent with our City's policies.
- Taking part in the refinement of collaboration plans and initiatives that will bring value to participants and lead to the longer-term sustainability of the regional Hub.

We are enthusiastic about collaborating with the Midwest Big Data Regional Innovation Hub team and being part of this novel forward-looking national initiative. We look forward to being invited and being part of the partnerships, and to providing input in order to establish a successful hub.

Sincerely,

Brenna M. Berman
Chief Information Officer and Commissioner
Department of Innovation & Technology
City of Chicago
312-744-9363
Brenna.Berman@cityofchicago.org

CITY OF DETROIT
INFORMATION TECHNOLOGY SERVICES DEPARTMENT

1301 3RD STREET, SUITE 426
DETROIT, MICHIGAN 48226
PHONE 313•224•2900
FAX 313•224•2158
WWW.DETROITMI.GOV

May 20, 2015

Ratna Babu Chinnam, Ph.D.
Director, Big Data & Business Analytics Group
Professor, Industrial & Systems Engineering Department
Wayne State University
4815 Fourth Street
Detroit, MI 48201

Re: Letter of Collaboration for Midwest Big Data Hub

Dear Dr. Chinnam,

The City of Detroit Department of Innovation and Technology (DoIT) is pleased to provide this letter confirming our commitment to collaborate with the proposed Midwest Big Data Innovation Hub (MBDH) team. Our company/organization is extremely interested in working with the universities driving this valuable effort to establish a cross-cutting Big Data Hub focused on key Big Data challenges and opportunities for the region.

In the hub and spoke design of this effort our company has a strong interest in several of the domains below, but will work with the leadership team to add our expertise in the spokes that most closely align with our business interests.

- Urban science/Smart cities
- Network science
- Business analytics

The success of such a Big Data Hub will depend on new collaborations being established between the private and public sectors, including industry, academia, state and local governments, national labs, foundations and non-profit organizations. Our company recognizes this and looks forward to leveraging our expertise, established collaborative programs and capabilities to complement and inform the MBDH's activities. We believe we can collaborate in the following manner:

- Taking part, as resources allow, in workshops to develop a common understanding of regional Big Data needs for spokes of interest to us with an emphasis on data sharing and access requirements, workforce development and professional training requirements.
- Participate in creating Big Data sharing policies, Big Data licensing policies and guidelines and the development of Big Data best practices at the spoke, hub and national level.

- As warranted and optimal, providing guest lecturers and presenters to seminar series and classes as well as mentors to student interns
- As warranted and consistent with company policies, providing access to large data sets under terms and conditions that will allow us to protect our interests and that of our stakeholders and yet, as part of a cross-hub effort, create the potential for new knowledge and opportunities of interest
- If applicable, hosting center researchers and students for extended stays and intellectual exchanges
- Sharing of employee expertise (data, information, and knowledge) as appropriate and consistent with our company's policies.
- Taking part in the refinement of collaboration plans and initiatives that will bring value to participants and lead to the longer-term sustainability of the regional Hub.

We are enthusiastic about collaborating with the Midwest Big Data Regional Innovation Hub team and being part of this novel forward-looking national initiative. We look forward to being invited and be part of the partnerships, and provide input in order to establish a successful hub.

Sincerely,

Beth Niblock
Chief Information Officer
City of Detroit
niblockb@detroitmi.gov
(313) 224-2900

June 15, 2015

Ratna Babu Chinnam, Ph.D.
Director, Big Data & Business Analytics Group
Professor, Industrial & Systems Engineering Department
Wayne State University
4815 Fourth Street
Detroit, MI 48201

Re: Letter of Collaboration for Midwest Big Data Hub

Dear Dr. Chinnam,

Cleo Communications is pleased to provide this letter confirming our commitment to collaborate with the proposed Midwest Big Data Innovation Hub (MBDH) team. Our company/organization is extremely interested in working with the universities driving this valuable effort to establish a cross-cutting Big Data Hub focused on key Big Data challenges and opportunities for the region.

In the hub and spoke design of this effort our company has a strong interest in several of the domains below, but will work with the leadership team to add our expertise in the spokes that most closely align with our business interests.

- Health sciences, Life sciences, Bioinformatics, Genomics
- Urban science/Smart cities
- Advanced manufacturing
- Network science
- Transportation
- Business analytics

The success of such a Big Data Hub will depend on new collaborations being established between the private and public sectors, including industry, academia, state and local governments, national labs, foundations and non-profit organizations. Our company recognizes this and looks forward to leveraging our expertise, established collaborative programs and capabilities to complement and inform the MBDH's activities. We believe we can collaborate in the following manner:

- Taking part, as resources allow, in workshops to develop a common understanding of regional Big Data needs for spokes of interest to us with an emphasis on data sharing and access requirements, workforce development and professional training requirements.
- Participate in creating Big Data sharing policies, Big Data licensing policies and guidelines and the development of Big Data best practices at the spoke, hub and national level
- As warranted and optimal, providing guest lecturers and presenters to seminar series and classes as well as mentors to student interns
- As warranted and consistent with company policies, providing access to large data sets under terms and conditions that will allow us to protect our interests and that of our stakeholders and yet, as part of a cross-hub effort, create the potential for new knowledge and opportunities of interest
- If applicable, hosting center researchers and students for extended stays and intellectual exchanges
- Sharing of employee expertise (data, information, and knowledge) as appropriate and consistent with our company's policies.

Cleo
4203 Galleria Drive
Love Park, IL 61111

P 800.233.2536
  815.282.7600
F 815.654.8294

cleo.com

- Taking part in the refinement of collaboration plans and initiatives that will bring value to participants and lead to the longer-term sustainability of the regional Hub.

We are enthusiastic about collaborating with the Midwest Big Data Regional Innovation Hub team and being part of this novel forward-looking national initiative. We look forward to being invited and be part of the partnerships, and provide input in order to establish a successful hub.

Sincerely,

Mahesh Rajasekharan
Chief Executive Officer
Cleo Communications

Cleo
4203 Galleria Drive
Love Park, IL 61111

P 800.233.2536
  815.282.7600
F 815.654.8294

cleo.com

Columbia University in the City of New York | *New York, NY 10027*

KATHLEEN McKEOWN
HENRY AND GERTRUDE ROTHSCHILD PROFESSOR
DIRECTOR, INSTITUTE FOR DATA SCIENCES AND ENGINEERING
(212) 939-7118
kathy@cs.columbia.edu
http://www.cs.columbia.edu/~kathy/

Department of Computer Science
450 Computer Science Building

(212) 939-7000
Fax: (212) 666-0140

June 23, 2015

To Whom It May Concern,

As the PI of the Northeast Big Data Innovation Hub, I am pleased to provide a strong letter of collaboration. We are looking forward to working closely with you and the other hubs. We want to express our strong support of your proposal to establish the Midwest Big Data Innovation Hub.

We are planning to work with you to jointly develop communities around complex problems in data, as well as to develop common data sharing tools and services. We look forward to participating in a cross-hub committee to plan how to provide national data services spanning all the BD Hubs.

I am pleased to be working together on this important national initiative for the Big Data community.

Sincerely,

Kathleen McKeown
Henry and Gertrude Rothschild Professor of Computer Science
Director, Data Science Institute
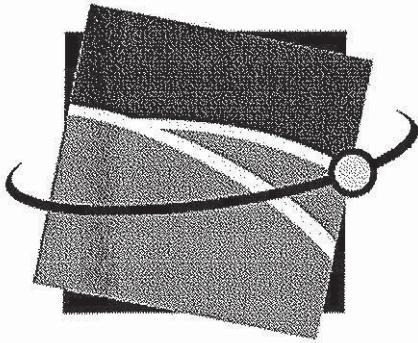
Dakota Precision Ag Center

June 22, 2015

Dr. Edward Seidel
Principal Investigator
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
1205 West Clark Street
Urbana, IL 61801

Re: Letter of Collaboration for Midwest Big Data Hub

Dear Dr. Seidel,

The Dakota Precision Ag Center (DPAC), located at Lake Region State College, is pleased to provide this letter confirming our commitment to collaborate with the proposed Midwest Big Data Innovation Hub (MBDH) team. The DPAC is keenly interested in collaborating with universities driving this valuable effort to establish a cross-cutting *Big Data Hub* focused on <u>key</u> Big Data challenges and opportunities for the region, particularly those found within production agriculture.

We have been at the forefront of Big Data in production agriculture and have years of experience imaging and stitching together field-level data. Recently, at the invitation of the United Kingdom which convened an initial European conclave exploring this subject, the DPAC joined like-minded academics and agribusiness spokespersons in Europe. Interestingly, we were the only U.S. institution in attendance. Hence, we are intrigued by your "hub and spoke" design for this effort. While our Center has a strong interest in several of the proposed domains, we would likely work with the leadership team to add our expertise in the following spokes:
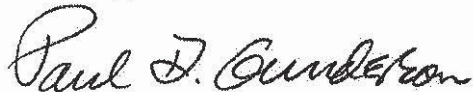
- Digital agriculture (precision farming, phenomics, remote/sensing, management information analytics)
- Network science and its implications for rural digital infrastructures
- The water-energy-food nexus

Our entire Center effort was launched as a private-public sector initiative in 2004. Hence, we believe the success of the proposed Big Data Hub will depend on new collaborations being established between the private and public sectors, including industry, academia, state and local governments, relevant national labs, foundations and non-profit organizations. The DPAC looks forward to leveraging our expertise, established collaborative effort and capabilities to complement and inform the MBDH's activities. We believe we can collaborate in the following manner:

- Taking part, as resources allow, in workshops to develop a common understanding of regional Big Data needs for spokes of interest to us with an emphasis on data sharing and access requirements, workforce development and professional training requirements.
- Participate in creating Big Data sharing policies, Big Data licensing policies and guidelines and the development of Big Data best practices at the spoke, hub and national level.
- As warranted and consistent with North Dakota University System (NDUS) policy, providing access to large data sets under terms and conditions that protect confidentiality of agricultural producers and other stakeholders and yet, as part of a cross-hub effort, create the potential for new knowledge and opportunities of interest.
- Sharing of employee expertise (data, information, and knowledge as guest lecturers and presenters) as appropriate and consistent with NDUS policy.
- Taking part in the refinement of collaboration plans and initiatives that will bring value to participants and lead to longer-term sustainability of the regional Hub.
- Mentoring student interns.

We are enthusiastic about collaborating with the Midwest Big Data Regional Innovation Hub team and being part of this novel forward-looking national initiative. We look forward to being invited and be part of the partnerships, and provide input in order to establish a successful hub.

Sincerely,

Paul D. Gunderson, Ph.D.
Director
(701)662-1652
Paul.D.Gunderson.1@lrsc.edu

Brittany Hanson, M.S.
Training Support Specialist
(701) 665-4611
brittany.r.hanson@lrsc.edu

June 15, 2015

Charlie Catlett
Director, Urban Center for Computation and Data
Computation Institute
The University of Chicago and Argonne National Laboratory
5735 S. Ellis Avenue
Chicago, IL 60637

Re: Letter of Collaboration for Midwest Big Data Hub

Dear Mr. Catlett

The City of Chicago Department of Innovation & Technology is pleased to provide this letter confirming our commitment to collaborate with the proposed Midwest Big Data Innovation Hub (MBDH) team.   Our department and city-wide Advanced Analytics Program is extremely interested in working with the universities driving this valuable effort to establish a cross-cutting Big Data Hub focused on key Big Data challenges and opportunities for the region.

In the hub and spoke design of this effort our City has a strong interest in several of the domains below, but will work with the leadership team to add our expertise in the spokes that most closely align with our residents' needs.

- Water-energy-resource nexus
- Urban science/Smart cities
- Advanced manufacturing
- Transportation
- Business analytics

The success of such a Big Data Hub will depend on new collaborations being established between the private and public sectors, including industry, academia, state and local governments, national labs, foundations and non-profit organizations. Chicago recognizes this and looks forward to leveraging our expertise, established collaborative programs and capabilities to complement and inform the MBDH's activities. We believe we can collaborate in the following manner:

- Taking part, as resources allow, in workshops to develop a common understanding of regional Big Data needs for spokes of interest to us with an emphasis on data sharing and access requirements, workforce development and professional training requirements.
- Participate in creating Big Data sharing policies, Big Data licensing policies and guidelines and the development of Big Data best practices at the spoke, hub and national level.
- As warranted and optimal, providing guest lecturers and presenters to seminar series and classes as well as mentors to student interns.
- As warranted and consistent with City policies, providing access to large data sets under terms and conditions that will allow us to protect our interests and that of our stakeholders and yet, as part of a cross-hub effort, create the potential for new knowledge and opportunities of interest. This point is specifically supported by the City's extensive open data portal.
- If applicable, hosting center researchers and students for extended stays and intellectual exchanges.
- Sharing of employee expertise (data, information, and knowledge) as appropriate and consistent with our City's policies.
- Taking part in the refinement of collaboration plans and initiatives that will bring value to participants and lead to the longer-term sustainability of the regional Hub.

We are enthusiastic about collaborating with the Midwest Big Data Regional Innovation Hub team and being part of this novel forward-looking national initiative. We look forward to being invited and being part of the partnerships, and to providing input in order to establish a successful hub.

Sincerely,

Brenna M. Berman
Chief Information Officer and Commissioner
Department of Innovation & Technology
City of Chicago
312-744-9363
Brenna.Berman@cityofchicago.org

DEPARTMENT OF VETERANS AFFAIRS
VA Center for Applied Systems Engineering
RICHARD L. ROUDEBUSH VA MEDICAL CENTER
1481 WEST 10th STREET
INDIANAPOLIS, IN 46202

June 12, 2015

Ratna Babu Chinnam, Ph.D.
Director, Big Data & Business Analytics Group
Professor, Industrial & Systems Engineering Department
Wayne State University
4815 Fourth Street
Detroit, MI 48201

Re: Letter of Collaboration for Midwest Big Data Hub

Dear Dr. Chinnam,

VA Center for Applied Systems Engineering (VA-CASE) is pleased to provide this letter confirming our commitment to collaborate with the proposed Midwest Big Data Innovation Hub (MBDH) team. Our organization is extremely interested in working with the universities driving this valuable effort to establish a cross-cutting Big Data Hub focused on key Big Data challenges and opportunities for the region.

In the hub and spoke design of this effort our organization has a strong interest in several of the domains below, but will work with the leadership team to add our expertise in the spokes that most closely align with our business interests.

- Health sciences, Life sciences, Bioinformatics, Genomics
- Network science
- Business analytics

The success of such a Big Data Hub will depend on new collaborations being established between the private and public sectors, including industry, academia, state and local governments, national labs, foundations and non-profit organizations. Our organization recognizes this and looks forward to leveraging our expertise, established collaborative programs and capabilities to complement and inform the MBDH's activities. We believe we can collaborate in the following manner:

- Taking part, as resources allow, in workshops to develop a common understanding of regional Big Data needs for spokes of interest to us with an emphasis on data sharing and access requirements, workforce development and professional training requirements.
- Participate in creating Big Data sharing policies, Big Data licensing policies and guidelines and the development of Big Data best practices at the spoke, hub and national level
- As warranted and optimal, providing guest lecturers and presenters to seminar series and classes as well as mentors to student interns

- As warranted and consistent with organization policies, providing access to large data sets under terms and conditions that will allow us to protect our interests and that of our stakeholders and yet, as part of a cross-hub effort, create the potential for new knowledge and opportunities of interest
- If applicable, hosting center researchers and students for extended stays and intellectual exchanges
- Sharing of employee expertise (data, information, and knowledge) as appropriate and consistent with our organization's policies.
- Taking part in the refinement of collaboration plans and initiatives that will bring value to participants and lead to the longer-term sustainability of the regional Hub.

We are enthusiastic about collaborating with the Midwest Big Data Regional Innovation Hub team and being part of this novel forward-looking national initiative. We look forward to being invited and to be part of the partnerships, and provide input in order to establish a successful hub.

Sincerely,

Heather Woodward-Hagg, PhD
Acting National Director, Veterans Engineering Resource Centers (VERC)
Director, VA Center for Applied Systems Engineering (VA-CASE)
317-430-5613

June 15, 2015

Ratna Babu Chinnam, Ph.D.
Director, Big Data & Business Analytics Group
Professor, Industrial & Systems Engineering Department
Wayne State University
4815 Fourth Street
Detroit, MI 48201

Re: Letter of Collaboration for Midwest Big Data Hub

Dear Dr. Chinnam,

Dominos Pizza is pleased to provide this letter confirming our commitment to collaborate with the proposed Midwest Big Data Innovation Hub (MBDH) team. Our company/organization is extremely interested in working with the universities driving this valuable effort to establish a cross-cutting Big Data Hub focused on key Big Data challenges and opportunities for the region.

In the hub and spoke design of this effort our company has a strong interest in several of the domains below, but will work with the leadership team to add our expertise in the spokes that most closely align with our business interests.

- Advanced manufacturing
- Network science
- Transportation
- Business analytics

The success of such a Big Data Hub will depend on new collaborations being established between the private and public sectors, including industry, academia, state and local governments, national labs, foundations and non-profit organizations. Our company recognizes this and looks forward to leveraging our expertise, established collaborative programs and capabilities to complement and inform the MBDH's activities. We believe we can collaborate in the following manner:

- Taking part, as resources allow, in workshops to develop a common understanding of regional Big Data needs for spokes of interest to us with an emphasis on data sharing and access requirements, workforce development and professional training requirements.

- Participate in creating Big Data sharing policies, Big Data licensing policies and guidelines and the development of Big Data best practices at the spoke, hub and national level
- As warranted and optimal, providing guest lecturers and presenters to seminar series and classes as well as mentors to student interns
- As warranted and consistent with company policies, providing access to large data sets under terms and conditions that will allow us to protect our interests and that of our stakeholders and yet, as part of a cross-hub effort, create the potential for new knowledge and opportunities of interest
- If applicable, hosting center researchers and students for extended stays and intellectual exchanges
- Sharing of employee expertise (data, information, and knowledge) as appropriate and consistent with our company's policies.
- Taking part in the refinement of collaboration plans and initiatives that will bring value to participants and lead to the longer-term sustainability of the regional Hub.

We are enthusiastic about collaborating with the Midwest Big Data Regional Innovation Hub team and being part of this novel forward-looking national initiative. We look forward to being invited and be part of the partnerships, and provide input in order to establish a successful hub.

Sincerely,

Henry Benedetto
Senior Data Scientist, Business Insights
Dominos Pizza LLC

June 15th, 2015

Ratna Babu Chinnam, Ph.D.
Director, Big Data & Business Analytics Group
Professor, Industrial & Systems Engineering Department
Wayne State University
4815 Fourth Street
Detroit, MI 48201

Re: Letter of Collaboration for Midwest Big Data Hub

Dear Dr. Chinnam,

Ford Motor Company is pleased to provide this letter confirming our commitment to collaborate with the proposed Midwest Big Data Innovation Hub (MBDH) team.   Our company is interested in working with the universities driving this valuable effort to establish a cross-cutting Big Data Hub focused on key Big Data challenges and opportunities for the region.

In the hub and spoke design of this effort, Ford Motor Company has a vested interest in several of the domains below, but will work with the leadership team to add our expertise in the spokes that most closely align with our business interests.

- Urban science/Smart cities
- Advanced manufacturing
- Network science
- Transportation
- Business analytics

The success of such a Big Data Hub will depend on new collaborations being established between the private and public sectors, including industry, academia, state and local governments, national labs, foundations and non-profit organizations. Ford Motor Company recognizes this and looks forward to leveraging our expertise, established collaborative programs and capabilities to complement and inform the MBDH's activities. We believe we can collaborate in the following manner:

- Taking part, as resources allow, in workshops to develop a common understanding of regional Big Data needs for spokes of interest to us with an emphasis on data sharing and access requirements, workforce development and professional training requirements.

- Participate in creating Big Data sharing policies, Big Data licensing policies and guidelines and the development of Big Data best practices at the spoke, hub and national level
- As warranted and optimal, providing guest lecturers and presenters to seminar series and classes as well as mentors to student interns

We are enthusiastic about collaborating with the Midwest Big Data Regional Innovation Hub team and being part of this novel forward-looking national initiative. We look forward to being invited and be part of the partnerships, and provide input in order to establish a successful hub.

Sincerely,

John M. Ginder
Manager, Advanced Operational Analytics
Global Data, Insight and Analytics
Ford Motor Company

Contact: Michael Cavaretta
Manager, Connectivity Analytics
Global Data, Insight and Analytics
Ford Motor Company
mcavaret@ford.com

GE Aviation
Information Technology

Jude Schramm
Chief Information Officer, Digital

One Neumann Way
F155
Cincinnati, OH 45215
USA

T+1 513 739-9036

May 29, 2015

Michael J. Fry, Ph.D.
Professor and Department Head, Operations, Business Analytics and Information Systems
Interim Director, Center for Business Analytics
University of Cincinnati
Cincinnati, OH 45221

Re: Letter of Collaboration for Midwest Big Data Hub

Dear Professor Fry,

GE Aviation is pleased to provide this letter confirming our commitment to collaborate with the proposed Midwest Big Data Innovation Hub (MBDH) team. Our organization is extremely interested in working with the universities driving this valuable effort to establish a cross-cutting Big Data Hub focused on key Big Data challenges and opportunities for the region.

In the hub and spoke design of this effort our company has a strong interest in the domains of business analytics, network science and advanced manufacturing. Additionally, we will work with the leadership team to add our expertise in the spokes that most closely align with our business interests.

The success of such a Big Data Hub will depend on new collaborations being established between the private and public sectors, including industry, academia, state and local governments, national labs, foundations and non-profit organizations. Our company recognizes this and looks forward to leveraging our expertise, established collaborative programs and capabilities to complement and inform the MBDH's activities. We believe we can collaborate in the following manner:

- Taking part, as resources allow, in workshops to develop a common understanding of regional Big Data needs for spokes of interest to us with an emphasis on data sharing and access requirements, workforce development and professional training requirements.
- As warranted and optimal, providing guest lecturers and presenters to seminar series and classes as well as mentors to student interns
- As warranted and consistent with company policies, providing access to large data sets under terms and conditions that will allow us to protect our interests and that of our

stakeholders and yet, as part of a cross-hub effort, create the potential for new knowledge and opportunities of interest
- If applicable, hosting center researchers and students for extended stays and intellectual exchanges
- Sharing of employee expertise (data, information, and knowledge) as appropriate and consistent with our company's policies.
- Taking part in the refinement of collaboration plans and initiatives that will bring value to participants and lead to the longer-term sustainability of the regional Hub.

We are enthusiastic about collaborating with the Midwest Big Data Regional Innovation Hub team and being part of this novel forward-looking national initiative. We look forward to being invited and be part of the partnerships, and provide input in order to establish a successful hub.

Sincerely,

Jude Schramm

June 1, 2015

Ratna Babu Chinnam, Ph.D.
Director, Big Data & Business Analytics Group
Professor, Industrial & Systems Engineering Department
Wayne State University
4815 Fourth Street
Detroit, MI 48201

Re: Letter of Collaboration for Midwest Big Data Hub

Dear Dr. Chinnam,

General Motors is pleased to provide this letter expressing our interest in collaborating
with the proposed Midwest Big Data Innovation Hub (MBDH) team.   Our
company/organization is extremely interested in working with the universities driving
this valuable effort to establish a cross-cutting Big Data Hub focused on key Big Data
challenges and opportunities for the region.

In the hub and spoke design of this effort our company has a strong interest in several of
the domains below, but will work with the leadership team to add our expertise in the
spokes that most closely align with our business interests.

- Urban science/Smart Cities
- Advanced Manufacturing
- Transportation
- Business Analytics

The success of such a Big Data Hub will depend on new collaborations being established
between the private and public sectors, including industry, academia, state and local
governments, national labs, foundations and non-profit organizations. Our company
recognizes this and looks forward to leveraging our expertise, established collaborative
programs and capabilities to complement and inform the MBDH's activities. We believe
we can collaborate in the following manner:

- Taking part, as resources allow, in workshops to develop a common
  understanding of regional Big Data needs for spokes of interest to us with an

emphasis on data sharing and access requirements, workforce development and professional training requirements.

- Participate in creating Big Data sharing policies, Big Data licensing policies and guidelines and the development of Big Data best practices at the spoke, hub and national level.
- As warranted and optimal, providing guest lecturers and presenters to seminar series and classes as well as mentors to student interns.
- As warranted and consistent with company policies, providing access to large data sets under terms and conditions that will allow us to protect our interests and that of our stakeholders and yet, as part of a cross-hub effort, create the potential for new knowledge and opportunities of interest.
- If applicable, hosting center researchers and students for extended stays and intellectual exchanges.
- Sharing of employee expertise (data, information, and knowledge) as appropriate and consistent with our company's policies.
- Taking part in the refinement of collaboration plans and initiatives that will bring value to participants and lead to the longer-term sustainability of the regional Hub.

We are enthusiastic about the opportunity and look forward to being invited to be part of the partnerships and providing input in order to establish a successful hub.

Sincerely,

Daniel D. Vivian
Executive Director – PD Analytics
Daniel.Vivian@gm.com
(586) 533-0691

June 23, 2015

Edward Seidel
Founder Professor of Physics, Professor of Astronomy
Director, National Center for Supercomputing Applications
University of Illinois

To Prof. Seidel,

As PIs of the South Big Data Regional Innovation Hub proposal, we are pleased to provide this letter of collaboration. We are looking forward to working closely with you and the other hubs. We want to express our strong support of your proposal to establish the Midwest Big Data Innovation Hub.

We are planning to work with you to jointly develop communities around complex problems in data, as well as to develop common data sharing tools and services. We look forward to participating in a cross-hub committee to plan how to provide national data services spanning all the BD Hubs.

We are pleased to be working together on this important national initiative for the Big Data community.

Sincerely,

Prof. Srinivas Aluru
School of Computational Science and Engineering
Co-Director, Strategic Initiative in Data Engineering and Science
Georgia Institute of Technology

Dr. Ashok Krishnamurthy
Deputy Director, Renaissance Computing Institute
University of North Carolina at Chapel Hill

Great American Tower Floor 17
301 East Fourth Street
Cincinnati, OH 45202
GreatAmericanInsuranceGroup.com

Kevin Kelley
Divisional Vice President, Predictive Analytics
direct 513 419 8863
kjkelley@gaig.com

Michael J. Fry, Ph.D.
Professor and Department Head, Operations, Business Analytics and Information Systems
Interim Director, Center for Business Analytics
University of Cincinnati
Cincinnati, OH 45221

Re: Letter of Collaboration for Midwest Big Data Hub

Dear Professor Fry,

Great American Insurance Group is pleased to provide this letter confirming our commitment to collaborate with the proposed Midwest Big Data Innovation Hub (MBDH) team. Our company/organization is extremely interested in working with the universities driving this valuable effort to establish a cross-cutting Big Data Hub focused on key Big Data challenges and opportunities for the region.

In the hub and spoke design of this effort our company has a strong interest in the domain of Business Analytics, but will work with the leadership team to add our expertise in the spokes that most closely align with our business interests.

The success of such a Big Data Hub will depend on new collaborations being established between the private and public sectors, including industry, academia, state and local governments, national labs, foundations and non-profit organizations. Our company recognizes this and looks forward to leveraging our expertise, established collaborative programs and capabilities to complement and inform the MBDH's activities. We believe we can collaborate in the following manner:

- Taking part, as resources allow, in workshops to develop a common understanding of regional Big Data needs for spokes of interest to us with an emphasis on data sharing and access requirements, workforce development and professional training requirements.
- As warranted and optimal, providing guest lecturers and presenters to seminar series and classes as well as mentors to student interns
- As warranted and consistent with company policies, providing access to large data sets under terms and conditions that will allow us to protect our interests and that of our stakeholders and yet, as part of a cross-hub effort, create the potential for new knowledge and opportunities of interest
- If applicable, hosting center researchers and students for extended stays and intellectual exchanges
- Sharing of employee expertise (data, information, and knowledge) as appropriate and consistent with our company's policies.
- Taking part in the refinement of collaboration plans and initiatives that will bring value to participants and lead to the longer-term sustainability of the regional Hub.

We are enthusiastic about collaborating with the Midwest Big Data Regional Innovation Hub team and being part of this novel forward-looking national initiative. We look forward to being invited and part of the partnerships and to provide input in order to establish a successful hub.

Sincerely,

Kevin Kelley

June 15, 2015

Ratna Babu Chinnam, Ph.D.
Director, Big Data & Business Analytics Group
Professor, Industrial & Systems Engineering Department
Wayne State University
4815 Fourth Street
Detroit, MI 48201

Re: Letter of Collaboration for Midwest Big Data Hub

Dear Dr. Chinnam,

The Henry Ford Health System is pleased to provide this letter confirming our commitment to collaborate with the proposed Midwest Big Data Innovation Hub (MBDH) team. Our company/organization is extremely interested in working with the universities driving this valuable effort to establish a cross-cutting Big Data Hub focused on key Big Data challenges and opportunities for the region.

In the hub and spoke design of this effort our company has a strong interest in several of the domains below, but will work with the leadership team to add our expertise in the spokes that most closely align with our business interests.

- Health sciences, Life sciences, Bioinformatics, Genomics
- Business analytics

The success of such a Big Data Hub will depend on new collaborations being established between the private and public sectors, including industry, academia, state and local governments, national labs, foundations and non-profit organizations. Our company recognizes this and looks forward to leveraging our expertise, established collaborative programs and capabilities to complement and inform the MBDH's activities. We believe we can collaborate in the following manner:

- Taking part, as resources allow, in workshops to develop a common understanding of regional Big Data needs for spokes of interest to us with an emphasis on data sharing and access requirements, workforce development and professional training requirements.
- Participate in creating Big Data sharing policies, Big Data licensing policies and guidelines and the development of Big Data best practices at the spoke, hub and national level
- As warranted and optimal, providing guest lecturers and presenters to seminar series and classes as well as mentors to student interns

- As warranted and consistent with company policies, providing access to large data sets under terms and conditions that will allow us to protect our interests and that of our stakeholders and yet, as part of a cross-hub effort, create the potential for new knowledge and opportunities of interest
- Sharing of employee expertise (data, information, and knowledge) as appropriate and consistent with our company's policies.
- Taking part in the refinement of collaboration plans and initiatives that will bring value to participants and lead to the longer-term sustainability of the regional Hub.

We are enthusiastic about collaborating with the Midwest Big Data Regional Innovation Hub team and being part of this novel forward-looking national initiative. We look forward to being invited and be part of the partnerships, and provide input in order to establish a successful hub.

Sincerely,

Josephine Molle
VP, Information Technology Applications
Jmolle1@hfhs.org

June 15, 2015

Ratna Babu Chinnam, Ph.D.
Director, Big Data & Business Analytics Group
Professor, Industrial & Systems Engineering Department
Wayne State University
4815 Fourth Street
Detroit, MI 48201

Re: Letter of Collaboration for Midwest Big Data Hub

Dear Dr. Chinnam,

IHS Automotive is pleased to provide this letter confirming our commitment to
collaborate with the proposed Midwest Big Data Innovation Hub (MBDH) team.   Our
company is extremely interested in working with the universities driving this valuable
effort to establish a cross-cutting Big Data Hub focused on key Big Data challenges and
opportunities for the region.

In the hub and spoke design of this effort our company has a strong interest in several of
the domains below, but will work with the leadership team to add our expertise in the
spokes that most closely align with our business interests.

- Network science
- Transportation
- Business analytics

The success of such a Big Data Hub will depend on new collaborations being established
between the private and public sectors, including industry, academia, state and local
governments, national labs, foundations and non-profit organizations. Our company
recognizes this and looks forward to leveraging our expertise, established collaborative
programs and capabilities to complement and inform the MBDH's activities. We believe
we can collaborate in the following manner:

- Taking part, as resources allow, in workshops to develop a common
  understanding of regional Big Data needs for spokes of interest to us with an
  emphasis on data sharing and access requirements, workforce development and
  professional training requirements.
- Participate in creating Big Data sharing policies, Big Data licensing policies and
  guidelines and the development of Big Data best practices at the spoke, hub and
  national level

- As warranted and optimal, providing guest lecturers and presenters to seminar series and classes as well as mentors to student interns
- As warranted and consistent with company policies, providing access to large data sets under terms and conditions that will allow us to protect our interests and that of our stakeholders and yet, as part of a cross-hub effort, create the potential for new knowledge and opportunities of interest
- Sharing of employee expertise (data, information, and knowledge) as appropriate and consistent with our company's policies.
- Taking part in the refinement of collaboration plans and initiatives that will bring value to participants and lead to the longer-term sustainability of the regional Hub.

We are enthusiastic about collaborating with the Midwest Big Data Regional Innovation Hub team and being part of this novel forward-looking national initiative. We look forward to being invited and be part of the partnerships, and provide input in order to establish a successful hub.

Sincerely,

Kathy Schroeder

Kathy Schroeder
Sr. Director, IS&S Production Operations
IHS Automotive, driven by Polk
Kathy.Schroeder@IHS.com

ILLINOIS INSTITUTE OF TECHNOLOGY

Ophir Trigalo
Vice Provost and Chief Information
Officer

Illinois Institute of Technology
10 West 35th Street, Room 8F3-1
Chicago, Illinois 60616-3793

Telephone 312.567.3290
E-mail trigalo@iit.edu

June 17, 2015

Prof. Edward Seidel
Principal Investigator
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
1205 West Clark Street
Urbana, IL 61801

Re: Letter of Collaboration for Midwest Big Data Hub

Dear Prof. Seidel (Ed):

On behalf of Illinois Institute of Technology, I am pleased to provide this letter confirming our intent to participate in the NSF Midwest Big Data Innovation Hub (MBDH) team led by the University of Illinois at Urbana-Champaign, Iowa State University, the University of Michigan, Ann Arbor, Indiana University, and the University of North Dakota. We are pleased to be one of a diverse group (public, private; small, large; R1, educational) of Midwest academic institutions working together to establish a cross-cutting "Big Data Hub" focused on key challenges and opportunities for the region in a truly novel public-private partnership. Big data research, education, and development of services are all rapidly growing in importance to our institutions. The development of accessible, reliable, and trustworthy datasets, and the building of communities around them through the use of efficient tools and services is critical to research and education, as well as the economic development of the region. We are enthusiastic and committed to the success of this national initiative. For our institution, the lead and point of contact for the MBDH effort will be Vice Provost and Chief Information Officer, Ophir Trigalo, Office of Technology Services, Illinois Institute of Technology (IIT).

The success of our Big Data Hub will bring together the public and private sectors in new partnerships, including industry, academia, state and local governments, national labs, foundations, and non-profit organizations. All these organizations can be expected to have significant resources that can be leveraged to ensure the MBDH's success.

While we make no commitments of voluntary cost sharing (in compliance with the terms of the solicitation), Illinois Institute of Technology has significant resources that will be leveraged and prove beneficial to the MBDH's success. This starts with the expertise and knowledge of our faculty, staff, and students, many of whom are already immersed in addressing grand challenges using big data and dedicated to developing education programs that address those challenges and related workforce development needs.

Numerous data-intensive research and education programs and externally-funded projects will benefit from and, in many cases, provide benefit to the MBDH. For example:
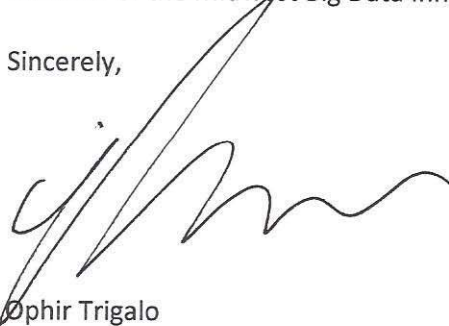
The IIT Medical Imaging Research Center (MIRC), which engages in specialized research of "technological issues relating to medical imaging and its applications, including image processing, image analysis, image acquisition, kinetic modeling, and machine learning," is storing, analyzing, and processing the full range of medical imaging. MIRC is leveraging funding totaling nearly $30 million from the National Science Foundation (NSF), National Institutes of Health (NIH), and numerous other agencies.

The IIT Wanger Institute for Sustainable Energy Research (WISER) continues to improve quality of life and positively impacts society by cultivating close collaboration within and outside of IIT to preserve our natural resources and the environment for future generations. Their efforts reduce our dependence on fossil fuels and, at the same time, provide sufficient and affordable sources of clean energy and water.

IIT also has significant and relevant contacts with industry and government that we intend to leverage to create and grow partnerships that will support the MBDH as well as benefit from the MBDH. For example, the Institute for Food Safety and Health (IFSH) is a world-class research institute that produces knowledge-based outcomes in the areas of food safety, food defense, and nutrition for stakeholders in government, industry, and academia. IFSH builds on and expands the vital work of the National Center for Food Safety and Technology (NCFST), a unique research consortium of IIT, the U.S. Food and Drug Administration (FDA), and the food industry represented by approximately 70 of the leading food manufacturers.

We fully expect a successful and dynamic hub will result in new discoveries, innovation, economic development, and quality of life in the region and the nation. We look forward to being an integral member of the Midwest Big Data Innovation Hub should it be awarded to this team.

Sincerely,

Ophir Trigalo

Vice Provost and Chief Information Officer
Illinois Institute of Technology

INDIANA
BIOSCIENCES
RESEARCH
INSTITUTE

June 22, 2015

Dr. Edward Seidel
Principal Investigator
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
1205 West Clark Street
Urbana, IL 61801

Re: Letter of Support and Collaboration for Midwest Big Data Hub

Dear Dr. Seidel,

The Indiana Biosciences Research Institute (IBRI) is pleased to provide this letter of support confirming our commitment to collaborate with the proposed Midwest Big Data Innovation Hub (MBDH) team.   Our Institution is extremely interested in working with the stakeholders throughout the Midwest to establish a collaborative "Big Data Hub" focused on key computational analytic challenges and opportunities for the region.

Already working in collaboration with Indiana's strong life science companies including Eli Lilly and Company, Roche, Cook Medical, and Dow Agro Sciences, the Institute has identified several areas of common interest where the IBRI, working with a "Big Data Hub" would be of mutual interest. Of particular interest are the following:

- Developing complementary bioinformatics tools that leverage existing "-omics" databases across companies to help scientists design computational experiments
- Integrating personal information across multiple health-care delivery systems to effect outcomes that improve the metabolic health of patients
- Building collaborative models for "technology" scientists and engineers to work with their "life science" colleagues in developing next generation innovation
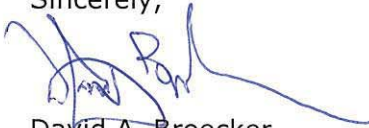
The success of such a Big Data Hub will depend on new collaborations being established between the private and public sectors, including industry, academia, state and local governments, national labs, foundations and non-profit organizations. The IBRI represents a unique model for this type of collaboration. Founded by Indiana's life sciences companies, the IBRI is the first industry-driven research institution in the country. Our stakeholders already recognize the value of collaboration. As our own "Big Data" initiatives evolve, we would be very willing to participate in multiple ways including;

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INSTITUTE**

- Taking part, as resources allow, in workshops to develop a common understanding of regional Big Data needs for spokes of interest to us with an emphasis on data sharing and access requirements, workforce development and professional training requirements.
- As warranted and optimal, providing guest lecturers and presenters to seminar series and classes as well as mentors to student interns
- If applicable, hosting center researchers and students for extended stays and intellectual exchanges
- Taking part in the refinement of collaboration plans and initiatives that will bring value to participants and lead to the longer-term sustainability of the regional Hub.

We are enthusiastic about collaborating with the Midwest Big Data Regional Innovation Hub team and being part of this novel forward-looking national initiative. We look forward to being invited and be part of the partnerships, and provide input in order to establish a successful hub.

Sincerely,

David A. Broecker
President and CEO
Indiana Biosciences Research Institute

June 21, 2015

Professor H. Edward Seidel
Principal Investigator
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
1205 West Clark Street
Urbana, IL 61801

Re: Letter of Collaboration for Midwest Big Data Hub

Dear Professor Seidel (Ed):

On behalf of Indiana University, I am pleased to provide this letter confirming our intent to participate in the NSF Midwest Big Data Innovation Hub (MBDH) team led by the University of Illinois at Urbana-Champaign, Iowa State University, the University of Michigan, Ann Arbor, Indiana University, and the University of North Dakota. We are pleased to be one of a diverse group of Midwest academic institutions working together to establish a crosscutting "Big Data Hub" focused on key challenges and opportunities for the region in a truly novel public-private partnership.

Big data research, education and development of services are all rapidly growing in importance to our institutions. The development of accessible, reliable, and trustworthy datasets, and the building of communities around them through the use of efficient tools and services that are supported by central core services is critical to research, education, and economic development of the region. We are enthusiastic and committed to the success of this national initiative. For our institution, the institutional leads and point of contacts for the MBDH effort will be Professor Beth Plale, School of Informatics and Computing and IU Data to Insight Center and Professor Bernice Pescosolido, Department of Sociology and IU Network Science Institute.

The success of MBDH will bring together the public and private sector in new partnerships including industry, academia, state and local governments, national labs, foundations and non-profit organizations. All these organizations can be expected to have significant resources that can be leveraged to ensure the MBDH's success. While we make no commitments of voluntary cost sharing (in compliance with the terms of the solicitation), Indiana University has significant resources that will be leveraged, and prove beneficial to the MBDH's success. This starts with the expertise and knowledge of our faculty, staff, and students – many of whom are already immersed in addressing grand challenges using big data and dedicated to developing education programs that address those challenges and related workforce development needs.

In addition, MBDH can leverage the new Data Science Program (MS and PhD) at the Indiana University School of Informatics and Computing, the IU Data to Insight Center, and the IU Network Science Institute to attract a wide-array of graduate students and researchers who are dedicated to the challenges of Big Data and Society.

Numerous data intensive research and education programs and externally funded projects will benefit from, and in many cases, provide benefit to the MBDH. For example, IU is leading the way in the development of services to manage and disseminate large amounts of data related to the National Center for Genome Analysis Support, the Polar Grid, the One Degree Imager Pipeline, and the SEAD DataNet workflow for sustainability data. IU is committed to the size and scope of these projects and through its centralized campus cyberinfrastructure provides a wide-array of tools and services that can support large-scale data management, curation, preservation, and publication for use in data sharing, replication and knowledge advancement. This includes such resources as the IU ScholarWorks Institutional Repository, the IU Scholarly Data Archive, the IU Research File System, and the Data Capacitor Wide-Area-Network. IU also supports several large-scale local computational resources including Big Red II, KARST and national resources such as JetStream.

Indiana University is also a leader in the development of the Research Data Alliance (RDA). Through the leadership of PI Beth Plale, RDA has grown in size and scope and supports data sharing activities that can be leveraged for the MBDH. This overlap activity can move regional initiatives that are ready to move to a more national or international scale to a forum that will bring in the benefit of international review and support.

Through the IU Network Science Institute, IU is bringing transformative scientific understanding of complex global, interactive systems through the interdisciplinary study of global-scale network data. This will enable a long-term transformative affect for MBDH on the understanding of problems that transcend institutional and societal boundaries such as resilience, trust and sustainability that are relevant to a wide range of complex network systems.

IU also has significant and relevant contacts with industry and other stakeholders that we intend to leverage from the state of Indiana for regional MBDH needs. This will enable MBDH to create and grow partnerships that will support the MBDH as well as benefit from the regional foci of the MBDH program. For example, IU has received corporate letters of support from Eli Lilly and Co., OrthoWorx, the Indiana Biosciences Research Institute, and Cook Medical.

We fully expect a successful and dynamic hub will result in new discoveries, innovation, economic development and quality of life in the region and the nation. We look forward to being an integral member of the Midwest Big Data Innovation Hub should it be awarded to this team.

Sincerely,

Jorge V. José, Dr. Sc.
Vice President for Research
Indiana University

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

Office of the Vice President for Research
2610 Beardshear Hall
Ames, Iowa 50011-2036
515 294-6344
FAX 515 294-6100

June 12, 2015

Prof. Edward Seidel
Principal Investigator
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
1205 West Clark Street
Urbana, IL 61801

Re: Letter of Collaboration for Midwest Big Data Hub

Dear Ed:

On behalf of Iowa State University, I am pleased to provide this letter confirming our intent to participate in the NSF Midwest Big Data Innovation Hub (MBDH) team led by the University of Illinois at Urbana-Champaign, Iowa State University, the University of Michigan, Ann Arbor, Indiana University, and the University of North Dakota. We are pleased to be one of a diverse group (public, private; small, large; R1, educational) of Midwest academic institutions working together to establish a cross-cutting Big Data Hub focused on key challenges and opportunities for the region in a truly novel public-private partnership. Big data research, education and development of services are all rapidly growing in importance to our institutions. The development of accessible, reliable, and trustworthy datasets, and the building of communities around them through the use of efficient tools and services is critical to research and education as well as the economic development of the region. We are enthusiastic and committed to the success of this national initiative. For our institution, the institutional lead and point of contact for the MBDH effort will be Sarah Nusser, Vice President for Research.

The success of our Big Data Hub will bring together the public and private sector in new partnerships including industry, academia, state and local governments, national labs, foundations and non-profit organizations. All these organizations can be expected to have significant resources that can be leveraged to ensure the MBDH's success.

While we make no commitments of voluntary cost sharing (in compliance with the terms of the solicitation), Iowa State University has significant resources that will be leveraged, and prove beneficial to the MBDH's success. This starts with the expertise and knowledge of our faculty, staff, and students – many of whom are already immersed in addressing grand challenges using big data and dedicated to developing education programs that address those challenges and related workforce development needs. In addition, MBDH will leverage an Iowa State research

development program, the Data Driven Science Initiative, that is expected to invest approximately $4.5 million over the next five years to build interdisciplinary research groups in the area of big data, together with outreach, engagement and educational components.

Numerous data intensive research and education programs and externally funded projects will benefit from, and in many cases, provide benefit to the MBDH. For example, Iowa State hired 13 new faculty last year in the area of Big Data, and we expect to hire another group of at least 8 – 10 faculty in the area for August 2015. The Data Driven Science Initiative on campus includes about 170 faculty and P&S researchers who collaborate on projects for external funding; on seminars, workshops, and retreats; and on education and engagement issues.

All these initiatives are also coordinated with the Steering Committee for High Performance Computing on campus that oversees purchasing and operation of large computer clusters, as well as HPC education initiatives. The integration and coordination of activities for the Data Driven Science Initiative is addressed through a central steering council that includes the Vice President for Research, Vice President for Outreach and Extension, Vice President for Industry Relations and Business Engagement, Deans, Chief Information Office, and Chairs of the Steering Committees for Research and for Education.

We also have significant and relevant contacts with industry and other stakeholders that we intend to leverage to create and grow partnerships that will support the MBDH as well as benefit from the MBDH. For example, we are collaborating with ISU Economic Development and Industry Relations and the Technology Association of Iowa to develop an engagement program with its member CTOs and CIOs and other interested parties. Our community, government and commercial contacts span the entire range of spokes proposed for the MBDH, including agriculture, advanced manufacturing, financial and data-related companies.

We fully expect a successful and dynamic hub will result in new discoveries, innovation, economic development and quality of life in the region and the nation. We look forward to being an integral member of the Midwest Big Data Innovation Hub should it be awarded to this team.

Sincerely,

Sarah M. Nusser, PhD
Vice President for Research
Iowa State University

JOHN DEERE

Moline Technology Innovation Center
1 John Deere Place
Moline, IL. 61265 USA
Phone: 309-765-5228
E-mail: ReidJohnF@JohnDeere.com

John Reid
Director,
Enterprise Product Innovation & Technology

4 June 2015

Dr. Edward Seidel
Principal Investigator
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
1205 West Clark Street
Urbana, IL 61801

Re: Letter of Collaboration for Midwest Big Data Hub

Dear Dr. Seidel,

Deere & Co. is pleased to provide this letter confirming our commitment to collaborate with the proposed Midwest Big Data Innovation Hub (MBDH) team. Our company/organization is extremely interested in working with the universities driving this valuable effort to establish a cross-cutting Big Data Hub focused on key Big Data challenges and opportunities for the region.

In the hub and spoke design of this effort our company has a strong interest in several of the domains below, but will work with the leadership team to add our expertise in the spokes that most closely align with our business interests.

- Life sciences
- Digital agriculture (precision farming, phenomics, remote/sensing, sustainability)
- Advanced manufacturing
- Business analytics
- Water-energy-food nexus

The success of such a Big Data Hub will depend on new collaborations being established between the private and public sectors, including industry, academia, state and local governments, national labs, foundations and non-profit organizations. Our company recognizes this and looks forward to leveraging our expertise, established collaborative programs and capabilities to complement and inform the MBDH's activities. We believe we can collaborate in the following manner:

- Taking part, as resources allow, in workshops to develop a common understanding of regional Big Data needs for spokes of interest to us with an

emphasis on data sharing and access requirements, workforce development and professional training requirements.

- Participate in creating Big Data sharing policies, Big Data licensing policies and guidelines and the development of Big Data best practices at the spoke, hub and national level
- As warranted and optimal, providing guest lecturers and presenters to seminar series and classes as well as mentors to student interns
- If applicable, hosting center researchers and students for extended stays and intellectual exchanges
- Sharing of employee expertise (data, information, and knowledge) as appropriate and consistent with our company's policies.
- Taking part in the refinement of collaboration plans and initiatives that will bring value to participants and lead to the longer-term sustainability of the regional Hub.

We are enthusiastic about collaborating with the Midwest Big Data Regional Innovation Hub team and being part of this novel forward-looking national initiative. We look forward to being invited and being part of the partnerships, and providing input in order to establish a successful hub.

Sincerely,

John Reid
Director, Enterprise Product Innovation & Technology
Moline Technology Innovation Center
Deere & Co.

Tel Ganesan
President & CEO
Kyyba, Inc.
28230 Orchard Lake Rd.
Farmington Hills, MI 48334

May 21, 2015

Ratna Babu Chinnam, Ph.D.
Director, Big Data & Business Analytics Group
Professor, Industrial & Systems Engineering Department
Wayne State University
4815 Fourth Street
Detroit, MI 48201

Re: Letter of Collaboration for Midwest Big Data Hub

Dear Dr. Chinnam,

Kyyba, Inc. is pleased to provide this letter confirming our commitment to collaborate
with the proposed Midwest Big Data Innovation Hub (MBDH) team. Our
company/organization is extremely interested in working with the universities driving
this valuable effort to establish a cross-cutting Big Data Hub focused on key Big Data
challenges and opportunities for the region.

In the hub and spoke design of this effort our company has a strong interest in several of
the domains below, but will work with the leadership team to add our expertise in the
spokes that most closely align with our business interests.

- Advanced manufacturing
- Network science
- Transportation
- Business analytics

The success of such a Big Data Hub will depend on new collaborations being established
between the private and public sectors, including industry, academia, state and local
governments, national labs, foundations and non-profit organizations. Our company
recognizes this and looks forward to leveraging our expertise, established collaborative
programs and capabilities to complement and inform the MBDH's activities. We believe
we can collaborate in the following manner:

- Taking part, as resources allow, in workshops to develop a common
  understanding of regional Big Data needs for spokes of interest to us with an

emphasis on data sharing and access requirements, workforce development and professional training requirements.

- Participate in creating Big Data sharing policies, Big Data licensing policies and guidelines and the development of Big Data best practices at the spoke, hub and national level
- As warranted and optimal, providing guest lecturers and presenters to seminar series and classes as well as mentors to student interns
- As warranted and consistent with company policies, providing access to large data sets under terms and conditions that will allow us to protect our interests and that of our stakeholders and yet, as part of a cross-hub effort, create the potential for new knowledge and opportunities of interest
- If applicable, hosting center researchers and students for extended stays and intellectual exchanges
- Sharing of employee expertise (data, information, and knowledge) as appropriate and consistent with our company's policies.
- Taking part in the refinement of collaboration plans and initiatives that will bring value to participants and lead to the longer-term sustainability of the regional Hub.

We are enthusiastic about collaborating with the Midwest Big Data Regional Innovation Hub team and being part of this novel forward-looking national initiative. We look forward to being invited and be part of the partnerships, and provide input in order to establish a successful hub.

Sincerely,

Tel Ganesan
President & CEO
tel@kyyba.com
248-910-4954

June 09, 2015

Dr. Edward Seidel
Principal Investigator
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
1205 West Clark Street
Urbana, IL 61801

Re: Letter of Collaboration for Midwest Big Data Hub

Dear Dr. Seidel,

Company/Organization ABC is pleased to provide this letter confirming our desire to collaborate with the proposed Midwest Big Data Innovation Hub (MBDH) team. Our company/organization is interested in working with the universities driving this valuable effort to establish a cross-cutting Big Data Hub focused on key Big Data challenges and opportunities for the region.

In the hub and spoke design of this effort our company has an interest in several of the domains below, and will work with the leadership team to address spokes that most closely align with our business interests.

- Water-energy-food nexus
- Health sciences, Life sciences, Bioinformatics, Genomics
- Urban science/Smart cities
- Digital agriculture (precision farming, phenomics, remote/sensing, sustainability)
- Network science
- Business analytics

The success of such a Big Data Hub will depend on new collaborations being established between the private and public sectors, including industry, academia, state and local governments, national labs, foundations and non-profit organizations. Our company recognizes this and looks forward to helping to establish collaborative programs and capabilities to complement and inform the MBDH's activities in ways that are consistent with our business goals. We believe we can collaborate in the following manner:

- Taking part, as resources allow, in workshops to develop a common understanding of regional Big Data needs for spokes of interest to us with an emphasis on data sharing and access requirements, workforce development and professional training requirements.

LI-COR, inc.
4421 Superior Street
Lincoln, NE 68504 USA
Phone: 402-467-3576
Toll Free U.S. & Canada: 800-447-3576
Fax: 402-467-2819
www.licor.com
envsales@licor.com

- Participate in creating Big Data sharing policies, Big Data licensing policies and guidelines and the development of Big Data best practices at the spoke, hub and national level
- As warranted and optimal, providing guest lecturers and presenters to seminar series and classes as well as mentors to student interns
- As warranted and consistent with company policies, providing access to large data sets under terms and conditions that will allow us to protect our interests and that of our stakeholders and yet, as part of a cross-hub effort, create the potential for new knowledge and opportunities of interest
- If applicable, hosting center researchers and students for extended stays and intellectual exchanges
- Sharing of employee expertise (data, information, and knowledge) as appropriate and consistent with our company's policies.
- Taking part in the refinement of collaboration plans and initiatives that will bring value to participants and lead to the longer-term sustainability of the regional Hub.

We are pleased to collaborate with the Midwest Big Data Regional Innovation Hub team and to be part of this novel forward-looking national initiative. We look forward to being invited to join the partnerships, and to provide input in order to establish a successful hub.
Sincerely,

Dayle McDermitt, Ph. D
Vice President Research and Development
LI-COR, Inc.
4647 Superior Street
Lincoln, NE 68504

LOVEN
S Y S T E M S

Date: May 28, 2015

To,

Ratna Babu Chinnam, Ph.D.
Director, Big Data & Business Analytics Group
Professor, Industrial & Systems Engineering Department
Wayne State University
4815 Fourth Street
Detroit, MI 48201

Re: Letter of Collaboration for Midwest Big Data Hub

Dear Dr. Chinnam,

DataFactZ is pleased to provide this letter confirming our commitment to collaborate with the proposed Midwest Big Data Innovation Hub (MBDH) team. Our company/organization is extremely interested in working with the universities driving this valuable effort to establish a cross-cutting Big Data Hub focused on key Big Data challenges and opportunities for the region.

In the hub and spoke design of this effort our company has a strong interest in several of the domains below, but will work with the leadership team to add our expertise in the spokes that most closely align with our business interests.

- Urban science/Smart cities
- Advanced manufacturing
- Network science
- Transportation
- Business analytics

The success of such a Big Data Hub will depend on new collaborations being established between the private and public sectors, including industry, academia, state and local governments, national labs, foundations and non-profit organizations. Our company recognizes this and looks forward to leveraging our expertise, established collaborative programs and capabilities to complement and inform the MBDH's activities. We believe we can collaborate in the following manner:

- Taking part, as resources allow, in workshops to develop a common understanding of regional Big Data needs for spokes of interest to us with an emphasis on data sharing and access requirements, workforce development and professional training requirements.
- Participate in creating Big Data sharing policies, Big Data licensing policies and guidelines and the development of Big Data best practices at the spoke, hub and national level

- As warranted and optimal, providing guest lecturers and presenters to seminar series and classes as well as mentors to student interns
- As warranted and consistent with company policies, providing access to large data sets under terms and conditions that will allow us to protect our interests and that of our stakeholders and yet, as part of a cross-hub effort, create the potential for new knowledge and opportunities of interest
- If applicable, hosting center researchers and students for extended stays and intellectual exchanges
- Sharing of employee expertise (data, information, and knowledge) as appropriate and consistent with our company's policies.
- Taking part in the refinement of collaboration plans and initiatives that will bring value to participants and lead to the longer-term sustainability of the regional Hub.

We are enthusiastic about collaborating with the Midwest Big Data Regional Innovation Hub team and being part of this novel forward-looking national initiative. We look forward to being invited and be part of the partnerships, and provide input in order to establish a successful hub.

Sincerely,

Venkat Gone
Vice-President
Loven Systems, LLC
Phone: (248) 504 6870

June 15, 2015

Michael J. Fry, Ph.D.
Professor and Department Head, Operations, Business Analytics and Information Systems
Interim Director, Center for Business Analytics
University of Cincinnati
Cincinnati, OH 45221

Re: Letter of Interest in Proposed Midwest Big Data Hub

Dear Professor Fry,

This letter is written to highlight the interest of Macy's Corporate Services, Inc. ("Macy's") in the proposed Midwest Big Data Innovation Hub ("Big Data Hub"). Macy's is interested in the possibility of working with participating universities to establish a comprehensive Big Data Hub focused on key Big Data challenges and opportunities for this region.

Macy's understands that the Big Data Hub is divided into different domains and Macy's is specifically interested in the domains of business analytics, network science and advanced manufacturing. Macy's also appreciates that the success of the proposed Big Data Hub depends largely on new collaborations between private and public sectors, including, industry, academia, state and local governments, national labs, foundations and non-profit organizations. Macy's anticipates that we can participate in the Big Data Hub in the following manner:

- Participating, as Macy's resources allow, in workshops to develop a common understanding of regional Big Data needs for areas of interest to Macy's with an emphasis on workforce development and professional training requirements.

- As determined by Macy's, providing guest lecturers and presenters to seminar series and classes as well as mentor student interns.

- As necessary, share the expertise of Macy's employees consistent with Macy's policies and procedures.

- Adding input to assist with the refinement of the Big Data Hub plans and initiatives that will bring value to participants and lead to the long-term sustainability of the regional Hub.

Macy's looks forward to the establishment of the Big Data Hub.

Sincerely,

Ginny Walls

Ginny Walls
Director, HR Analytics
Macy's
ginny.walls@macys.com

MAYO CLINIC

200 First Street SW
Rochester, Minnesota 55905
507-284-2511

June 5, 2015

Dr. Edward Seidel
Principal Investigator
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
1205 West Clark Street
Urbana, IL 61801

Re: Letter of collaboration for Midwest Big Data Hub

Dear Dr. Seidel,

Mayo Clinic is pleased to provide this letter confirming our commitment to collaborate with the proposed Midwest Big Data Innovation Hub (MBDH) team. Our company is extremely interested in working with the universities driving this valuable effort to establish a cross-cutting Big Data Hub focused on key Big Data challenges and opportunities for the region.

In the hub and spoke design of this effort, our company has a strong interest in several of the domains below, but will work with the leadership team to add our expertise in the spokes that most closely align with our business interests.

- Health sciences, Life sciences, Bioinformatics, Genomics
- Business analytics

The success of such a Big Data Hub will depend on new collaborations being established between the private and public sectors, including industry, academia, state and local governments, national labs, foundations and non-profit organizations. Our company recognizes this and looks forward to leveraging our expertise, established collaborative programs and capabilities to complement and inform the MBDH's activities. We believe we can collaborate in the following manner:
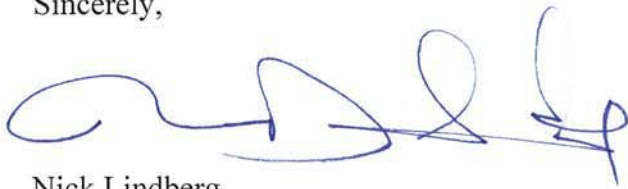
- Taking part, as resources allow, in workshops to develop a common understanding of regional Big Data needs for spokes of interest to us with an emphasis on data sharing and access requirements, workforce development and professional training requirements.
- Participate in creating Big Data sharing policies, Big Data licensing policies and guidelines and the development of Big Data best practices at the spoke, hub and national level
- As warranted and consistent with company policies, providing access to large data sets under terms and conditions that will allow us to protect our interests and that of our stakeholders and yet, as part of a cross-hub effort, create the potential for new knowledge and opportunities of interest

- Taking part in the refinement of collaboration plans and initiatives that will bring value to participants and lead to the longer-term sustainability of the regional Hub.

We are enthusiastic about collaborating with the Midwest Big Data Regional Innovation Hub team and being part of this novel forward-looking national initiative. We look forward to being invited, being part of the partnerships, and to provide input in order to establish a successful hub.

Sincerely,

Jean-Pierre Kocher, Ph.D.
Associate Professor of Biomedical Informatics
Chair, Division of Biomedical Statistics and Informatics
Department of Health Sciences Research

Keith Stewart, M.B., Ch.B.
Carlson and Nelson Endowed Director, Center for Individualized Medicine
Vasek and Anna Maria Polak Professor of Cancer Research
Professor of Medicine

James D. Buntrock
Vice Chair, Information Technology
Information Management and Analytics
Instructor of Medical Informatics
Mayo Clinic

June 12, 2015

Dr. Edward Seidel
Principal Investigator
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
1205 West Clark Street
Urbana, IL 61801

Re: Letter of Collaboration for Midwest Big Data Hub

Dear Dr. Seidel,

The Milwaukee Institute, one of the only institutional partners in NCSA's Private Sector Program (PSP), is pleased to provide this letter confirming our commitment to collaborate with the proposed Midwest Big Data Innovation Hub (MBDH) team. Our organization is extremely interested in working with the universities driving this valuable effort to establish a cross-cutting Big Data Hub focused on key Big Data challenges and opportunities for the region, and can bring to bear a significant network of commercial entities in southeast Wisconsin.

In the hub and spoke design of this effort our institution has a strong interest in several of the domains below, but will work with the leadership team to add our expertise in the spokes that most closely align with our business interests.

- Health sciences, Life sciences, Bioinformatics, Genomics
- Urban science/Smart cities
- Advanced manufacturing
- Network science

The success of such a Big Data Hub will depend on new collaborations being established between the private and public sectors, including industry, academia, state and local governments, national labs, foundations and non-profit organizations. The Milwaukee Institute recognizes this and looks forward to leveraging our expertise, established collaborative programs with small, medium and enterprise businesses, and computing capabilities to complement and inform the MBDH's activities. We believe we can collaborate in the following manner:

- Taking part, as resources allow, in workshops to develop a common understanding of regional Big Data needs for spokes of interest to us with an

emphasis on data sharing and access requirements, workforce development and professional training requirements.

- Participate in creating Big Data sharing policies, Big Data licensing policies and guidelines and the development of Big Data best practices at the spoke, hub and national level
- As warranted and optimal, providing guest lecturers and presenters to seminar series and classes as well as mentors to student interns
- If applicable, hosting center researchers and students for extended stays and intellectual exchanges
- Sharing of our industry partner's employee expertise (data, information, and knowledge) as appropriate and consistent with our company's policies.
- Taking part in the refinement of collaboration plans and initiatives that will bring value to participants and lead to the longer-term sustainability of the regional Hub.

We are enthusiastic about collaborating with the Midwest Big Data Regional Innovation Hub team and being part of this novel forward-looking national initiative. Our local network of manufacturing and design companies in Wisconsin, including Rockwell Automation, Briggs & Stratton, and SC Johnson, will provide a very important resource for encapsulating relevant big data topics here in the Midwest. We look forward to being invited to and being part of said partnerships, and being able to provide input in order to establish a successful Midwest hub, the success of which is vital to growing and keeping industry here in the Midwest.

Sincerely,

Nick Lindberg
Director of Engineering
nlindberg@mkei.org
414-727-6413

June 18, 2015

Dr. Edward Seidel
Principal Investigator
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
1205 West Clark Street
Urbana, IL 61801

Re: Letter of Collaboration for Midwest Big Data Hub

Dear Dr. Seidel,

It is my great pleasure to write this letter of collaboration and support for your application to establish a Midwest Big Data Regional Innovation Hub. Your proposed Hub has great potential for developing new partnerships in Big Data focused on key challenges in the Midwest Region. I am thus excited to serve as senior personnel on your application from Missouri University of Science and Technology, Rolla, MO.

I serve as the Site Director of the NSF I/UCRC on Net Centric and Cloud Systems and Software where we have industry support on various projects related to Big Data and Cloud Computing with respect to data security and management. The center would benefit from the Big Data Regional Innovation Hub that you propose to bring more partnerships. I also have a 3 years NSF grant on Big Data management for disaster applications to continue research in this area. My institution is committed to the success of the Hub and has supported my involvement in the Urban Planning and Smart City applications. They have expressed their willingness to continue their support, and I will be working to identify, contact, and engage potential partners in the State of Missouri. We also have Big Data certificates program which will benefit the educational component associated with Big Data Regional Innovation Hub. Our partners may benefit from the courses and educational materials that have been developed for these programs, and for access to the students who are participating in these programs.

In addition to industry partnerships, my Initiative and S & T are willing to collaborate in workshops to develop common interests and understanding of regional needs, participate in creating Big Data sharing policies and best practices, host guest lecturers and presenters to speak to regional audiences about Big Data.

We look forward to working with the proposed Midwest Big Data Regional Innovation Hub as a means for sharing our expertise and collaborating with others. We have other faculty who have expressed interest in the Hub and willingness to share expertise and resources for the benefit of new partnerships.

I wish you success with your application and look forward to continuing our collaborations for the success of the Hub. If you need any additional information, you can feel free to contact me by email, madrias@mst.edu.

Sincerely yours,

Sanjay Madria, Professor and Associate Chair for Research
Site Director, NSF I/UCRC Center on Net-Centric System Software
Director, Web and Wireless Computing Lab

Nebraska Public Power District

"Always there when you need us"

Patrick L Pope
President & CEO
(402) 563-5029
plpope@nppd.com

June 17, 2015

Dr. Edward Seidel
Principal Investigator
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
1205 West Clark Street
Urbana, IL 61801

Re: Letter of Collaboration for Midwest Big Data Hub

Dear Dr. Seidel,

Nebraska Public Power District (NPPD) is pleased to provide this letter confirming our commitment to collaborate with the proposed Midwest Big Data Innovation Hub (MBDH) team. Our organization is extremely interested in working with the universities driving this valuable effort to establish a cross-cutting Big Data Hub focused on key Big Data challenges and opportunities for the region.

In the hub and spoke design of this effort, our organization has a strong interest in several of the domains below, but will work with the leadership team to add our expertise in the spokes that most closely align with our business interests.

- Water-energy-food nexus
- Health sciences, Life sciences, Bioinformatics, Genomics
- Urban science/Smart cities
- Digital agriculture (precision farming, phenomics, remote/sensing, sustainability)
- Advanced manufacturing
- Network science
- Transportation
- Electric utility smart grid
- Business analytics

The success of such a Big Data Hub will depend on new collaborations being established between the private and public sectors, including industry, academia, state and local governments, national labs, foundations and non-profit organizations. Our organization recognizes this and looks forward to leveraging our expertise, established collaborative programs and capabilities to complement and inform the MBDH's activities. We believe we can collaborate in the following manner:

- Taking part, as resources allow, in workshops to develop a common understanding of regional Big Data needs for spokes of interest to us with an emphasis on data sharing and access requirements, workforce development and professional training requirements.
- Participate in creating Big Data sharing policies, Big Data licensing policies and guidelines and the development of Big Data best practices at the spoke, hub and national level
- As warranted and optimal, providing guest lecturers and presenters to seminar series and classes as well as mentors to student interns
- As warranted and consistent with our organization's policies, providing access to large data sets under terms and conditions that will allow us to protect our interests and that of our stakeholders and yet, as part of a cross-hub effort, create the potential for new knowledge and opportunities of interest
- If applicable, hosting center researchers and students for extended stays and intellectual exchanges
- Sharing of employee expertise (data, information, and knowledge) as appropriate and consistent with our organization's policies.
- Taking part in the refinement of collaboration plans and initiatives that will bring value to participants and lead to the longer-term sustainability of the regional Hub.

We are enthusiastic about collaborating with the Midwest Big Data Regional Innovation Hub team and being part of this novel forward-looking national initiative. We look forward to being invited and be part of the partnerships, and provide input in order to establish a successful hub.

Sincerely,

Patrick L. Pope
President and CEO

cc: Alan L. Dostal - NPPD
    Thomas J. Kent – NPPD
    David W. Webb - NPPD
    Michael A. Nastasi - Director, Nebraska Center for Energy Sciences Research

June 16, 2015

Professor Edward Seidel
Principal Investigator
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
1205 West Clark Street
Urbana, IL 61801

Re: Letter of Collaboration for Midwest Big Data Hub Proposal in response to NSF 15-562
        Program Solicitation

Dear Professor Seidel:

On behalf of the University of Michigan, I am pleased to provide this letter confirming our intent
to participate in the NSF Midwest Big Data Innovation Hub (MBDH) team led by the University
of Illinois at Urbana-Champaign, Iowa State University, the University of Michigan, Ann Arbor,
Indiana University, and the University of North Dakota. We are pleased to be one of a diverse
group (public, private; small, large; R1, educational) of midwest academic institutions working
together to establish a cross-cutting "Big Data Hub" focused on key challenges and opportunities
for the region in a truly novel public-private partnership. Big data research, education and
development of services are all rapidly growing in importance to our institutions. The
development of accessible, reliable, and trustworthy datasets, and the building of communities
around them through the use of efficient tools and services is critical to research and education as
well as the economic development of the region. We are enthusiastic and committed to the
success of this national initiative. For our institution, the institutional lead and point of contact
for the MBDH effort will be Brian Athey, PhD, Professor and Chair, Department of
Computational Medicine & Bioinformatics (DCM&B) at the University of Michigan Medical
School.

The success of our Big Data Hub will bring together the public and private sector in new
partnerships including industry, academia, state and local governments, national labs,
foundations and non-profit organizations. All of these organizations can be expected to have
significant resources that can be leveraged to ensure the MBDH's success.

While we make no commitments of voluntary cost sharing (in compliance with the terms of the
solicitation), the University of Michigan has significant resources that will be leveraged, and
prove beneficial to the MBDH's success. This starts with the expertise and knowledge of our
faculty, staff, and students – many of whom are already immersed in addressing grand challenges

using big data and dedicated to developing education programs that address those challenges and related workforce development needs.

In July 2015, the University of Michigan (U-M) will launch a five-year Data Science Initiative by creating the Michigan Data Science Institute (MIDAS) and strengthening investments in Data Science Services and Infrastructure. The U-M Office of Advanced Research Computing (ARC) includes MIDAS, the Michigan Institute for Computational Discovery and Engineering (MICDE) and two technical and consulting service organizations. MIDAS will be comprised of an interdisciplinary core faculty of ~40 data scientists (statistics and mathematics, computer science and engineering, information science and a range of data science intensive application experts). MIDAS will also include a Data Science Challenge Initiatives Program (Learning Analytics, Transportation, Social Sciences, Personalized Health), a Data Science Education and Training Program as well as an Industry Engagement Program. It is expected that the U-M Data Science Initiative will position the university as a national leader in data science, benefiting the campus, state and nation by advancing the interdisciplinary field of data science, development of new and enhanced educational programs and world-class data science services and infrastructure.

The University of Michigan has a long and rich history of interdisciplinary collaboration. Selected examples of recent interdisciplinary partnerships that the University is involved with are:

- The Institute for Social Research (ISR) is the world's largest academic social science survey and research organization. A leader in developing and applying new social science methods, ISR is composed of five research centers that include the Center for Political Studies, Inter-university Consortium for Political and Social Research (ICPSR), Population Studies Center, Research Center for Group Dynamics and the Survey Research Center.

- The Institute for Healthcare Policy and Innovation (IHPI) unites more than 430 health services researchers from across the University of Michigan, several nonprofit and private sector partners, to help solve the country's thorniest healthcare problems -- improving the quality, safety, equity, and affordability of health care services.

- Sustainable Environment Actionable Data (SEAD) is an NSF-sponsored project to create data services designed to meet the needs of sustainability science research. Sustainability science requires reliable cyberinfrastructure and an enhanced ability to manage, integrate, interpret, share, curate, and preserve data across a broad range of physical and social science disciplines. Launched in 2011, SEAD began public rollout of tools and services in November 2013 that include SEAD's Data Services, Project Spaces, Virtual Archive and Research Network.

- The Mobility Transformation Center (MTC) is a public/private R&D partnership that will lead a revolution in mobility by developing the foundations for a commercially viable ecosystem of connected and automated vehicles. One of the central goals is to develop

and implement an advanced system of connected and automated vehicles in Ann Arbor by 2021. Founding partners include 13 global corporations in auto manufacturing, suppliers, ITS, insurance, telecommunications, data management, and mobility services.

The University of Michigan's interests in a regional consortium are bi-directional. The U-M will develop industry and academic partnerships that draw on consortium-wide special capabilities and opportunities, including joint projects that apply data science to solve real world problems, and to train the next-generation of interdisciplinary scientists. The University (MIDAS) will contribute intellectually to the proposed consortium by providing access to world-class experts in data science disciplines. The University is committed to serving on consortium steering or advisory committees. The University will consider other contributions and potential partnerships as the consortium is established.

We fully expect a successful and dynamic hub will result in new discoveries, innovation, economic development and quality of life in the region and the nation. We look forward to being an integral member of the Midwest Big Data Innovation Hub should it be awarded to this team.

Sincerely,

S. Jack Hu

June 22, 2015

Prof. Edward Seidel
Principal Investigator
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
1205 West Clark Street
Urbana, IL 61801

Re: Letter of Collaboration for Midwest Big Data Hub

Dear Prof. Seidel:

On behalf of the University of Missouri, I am pleased to provide this letter confirming our intent to participate in the NSF Midwest Big Data Innovation Hub (MBDH) team led by the University of Illinois at Urbana-Champaign, Iowa State University, the University of Michigan, Ann Arbor, Indiana University, and the University of North Dakota. We are pleased to be one of a diverse group (public, private; small, large; R1, educational) of midwest academic institutions working together to establish a cross-cutting "Big Data Hub" focused on key challenges and opportunities for the region in a truly novel public-private partnership. Big data research, education and development of services are all rapidly growing in importance to our institutions. The development of accessible, reliable, and trustworthy datasets, and the building of communities around them through the use of efficient tools and services is critical to research and education as well as the economic development of the region. We are enthusiastic and committed to the success of this national initiative. For our institution, the institutional lead and point of contact for the MBDH effort will be Timothy Middelkoop, Director of Research Computing Support Services, Division of IT and Assistant Teaching Professor department of Industrial and Manufacturing Systems Engineering.

The success of our Big Data Hub will bring together the public and private sector in new partnerships including industry, academia, state and local governments, national labs, foundations and non-profit organizations. All these organizations can be expected to have significant resources that can be leveraged to ensure the MBDH's success.

While we make no commitments of voluntary cost sharing (in compliance with the terms of the solicitation), the University of Missouri has significant resources that will be leveraged, and prove beneficial to the MBDH's success. This starts with the expertise and knowledge of our faculty, staff, and students – many of whom are already immersed in addressing grand challenges using big data and dedicated to developing education programs that address those challenges and related workforce development needs. The University of Missouri will soon be offering a certificate program in big data science.

Numerous data intensive research and education programs and externally funded projects will benefit from, and in many cases, provide benefit to the MBDH. For example, the University of Missouri, through a CMS Health Care Innovation Award and follow-up studies, compiled emergency medical record (EMR) data and claims data on 10,000 Medicare and Medicaid beneficiaries. These data involve over 19,000 attributes per patient, so data mining and availability for additional studies will require the high performance computing capabilities and a big data environment like that proposed for the MBDH. Numerous research projects support big data collections and data analysis networks. The soybean knowledge base project (SoyKB), a comprehensive all-inclusive web resource for soybean omics research. SoyKB is designed to handle the storage and integration of the gene, genomics, EST, microarray, transcriptomics,

proteomics, metabolomics, pathway and phenotype data from national and international studies. SoyKB (soykb.org) provides an informatics-based social network system to build connections among soybean researchers, producers and consumers. Research sponsored by the NIH, the NSF and the DOE has focused on developing and applying computational methods and models (e.g., machine learning, data mining and optimization techniques) to analyze big biomedical data and address fundamental problems in biomedical sciences. Currently, MU faculty and students are developing bioinformatics algorithms and tools for protein structure and function prediction, systems biology, genomics and epigenomics. We have active projects in protein structure and function prediction, 3D genome structure modeling, inference and simulation of biological networks and systems (e.g., gene regulatory networks, metabolic networks, signal transduction networks, protein-protein interaction networks, and gene-gene interaction networks), protein interaction and docking, biological sequence alignments, RNAseq and microarray gene expression data analysis, genomics, epigenomics, proteomics, and plant and animal bioinformatics and systems biology. MU has also been a leader in the development of The Center for Applied Research and Environmental Systems (CARES), which has a long history of building mapping, reporting, and collaboration systems that enable public and nonprofit sector organizations to effectively address social, economic and environmental issues. Expertise includes developing systems with low bandwidth connectivity in mind. Competencies in knowledge management, GIS, and data management and visualization are manifested in Community Commons (www.communitycommons.org). These and other projects at the University of Missouri will work with and add capacity to the proposed MBDH.

We also have significant and relevant contacts with industry and other stakeholders that we intend to leverage to create and grow partnerships that will support the MBDH as well as benefit from the MBDH. For example, the University of Missouri has worked closely with Cerner Health to create a Cerner HealthFacts database, which catalogs de-identified electronic medical records (EMR) data from 47 million patients, including 2.8 billion lab results and 357 million medication orders. This database is housed at the University of Missouri and steps are being taken to create viable access for the biomedical and healthcare industries. As part of the University of Missouri affiliation within the M. D. Anderson cancer network, a new project is developing with Roche Diagnostics to integrate EMR data to optimize oncologic care. This application will eventually involve next generation sequencing integration (precision medicine) into a big data environment that will benefit from and feed its association with the MBDH.

We fully expect a successful and dynamic hub will result in new discoveries, innovation, economic development and quality of life in the region and the nation. We look forward to being an integral member of the Midwest Big Data Innovation Hub should it be awarded to this team.

Sincerely,

Henry C. Foley, Ph.D.
UM System Executive Vice President for
  Academic Affairs, Research and Economic Development
MU Senior Vice Chancellor for Research and Graduate Studies

c: Gary Allen, Vice President, Information Technology, UM
        Mark McIntosh, Associate Vice Chancellor for Research and Strategic Initiatives, MU

PARDEE RAND GRADUATE SCHOOL

June 15, 2015

Prof. Edward Seidel
Principal Investigator
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
1205 W. Clark Street
Urbana, IL 61801

Dear Prof. Seidel,

I am pleased to support the proposal for the Midwest Big Data Regional Innovation Hub coordinated by the University of Illinois, Urbana-Champaign. The proposed NSF sponsored hub (NSF 15-562) would provide a unique opportunity for collaboration between RAND, the industrial/academic partners, and other stakeholders. Dr. Carter Price from our Department of Engineering and Applied Sciences will serve as RAND's organizational representative for the Midwest Big Data Hub.

For years RAND has provided leadership in data science activities and our analytical work now includes Big Data tools and methodologies for processing larger and more varied data sets. Recent Big Data analysis at RAND includes a National Institute of Justice funded project on digital evidence forensics that is employing Apache Spark as well a project that helped the Navy address its growing quantity of sensor data. In addition, RAND's Robust Decision Making (RDM) method and software was used to support Louisiana's 2012 Comprehensive Master Plan and RAND researchers recently led a U.S. DOT Federal Highway Administration webinar series on Big Data for Transportation Modeling and Planning.

We recognize that by participating in this effort, we will have the opportunity to play an active role in catalyzing a vibrant and robust Big Data ecosystem. RAND has deep experience in bringing together multiple stakeholders from government, industry, and academia; we are positioned to help drive national collaboration through our participation in several geographic hubs. In this regard, we can offer expertise in wide ranging public policy fields through several components of the RAND Corporation. In particular, we will leverage students and faculty of the Pardee RAND Graduate School (the largest public policy Ph.D. program in the nation). This includes the policy technologist concentration we are establishing and the data science-relevant courses (such as Big Data for Public Policy and Predictive Analytics). We will also leverage RAND's recent creation of six Methods Centers, including the Scalable Computing and Analysis Methods Center that is helping shape the incorporation of Big Data techniques and practices into RAND's data science activities.

We expect great research opportunities and breakthrough innovations through the Midwest Big Data Hub activities. The RAND Corporation is committed to supporting these activities and we look forward to collaborating with you and other stakeholders in the coming years.

Sincerely,

Susan L. Marquis
Dean, Pardee RAND Graduate School

cc: Carter Price
        Mathematician, RAND Corporation
        price@rand.org
        703.413.1100 x5421

Be the answer

June 12th, 2015

Dr. Edward Seidel
Principal Investigator
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
1205 West Clark Street
Urbana, IL 61801

Re: Letter of Collaboration for Midwest Big Data Hub

Dear Dr. Seidel,

QuesTek Innovations LLC is pleased to provide this letter confirming our commitment to collaborate with the proposed Midwest Big Data Innovation Hub (MBDH) team. Our company is extremely interested in working with the universities driving this valuable effort to establish a cross-cutting Big Data Hub focused on key Big Data challenges and opportunities for the region.

QuesTek is a global leader in Integrated Computational Materials Engineering (ICME) approaches that are a part of the Materials Genome Initiative. We are currently leading a 3.25 year, multimillion dollar contract under DARPA's Simplifying Complexity in Scientific Discovery (SIMPLEX) program. The goal of SIMPLEX is to develop tools for scientific data analysis to facilitate big hypothesis generation and accelerate scientific discovery. QuesTek's role will be to apply these ideas to materials science, leveraging QuesTek's extensive and proven experience in metal alloy systems design to develop powerful new machine learning materials discovery tools and apply them to the problem of high-performance thermoelectric materials.

We will leverage these experiences during our participation in the MBDH team. In the hub and spoke design of this effort we have a strong interest in several of the domains below, but our expertise will enable us to contribute greatly to the *advanced manufacturing* activities harnessing our experiences in materials design in both traditional and novel manufacturing techniques (including 3D printing, etc).

The success of such a Big Data Hub will depend on new collaborations being established between the private and public sectors, including industry, academia, state and local governments, national labs, foundations and non-profit organizations. Our company recognizes this and looks forward to leveraging our expertise, established collaborative programs and capabilities to complement and inform the MBDH's activities. We believe we can collaborate in the following manner:

CREATING MATERIALS BY DESIGN

- Taking part, as resources allow, in workshops to develop a common understanding of regional Big Data needs for spokes of interest to us with an emphasis on data sharing and access requirements, workforce development and professional training requirements.
- Participate in creating Big Data sharing policies, Big Data licensing policies and guidelines and the development of Big Data best practices at the spoke, hub and national level
- As warranted and optimal, providing guest lecturers and presenters to seminar series and classes as well as mentors to student interns
- As warranted and consistent with company policies, providing access to large data sets under terms and conditions that will allow us to protect our interests and that of our stakeholders and yet, as part of a cross-hub effort, create the potential for new knowledge and opportunities of interest
- If applicable, hosting center researchers and students for extended stays and intellectual exchanges
- Sharing of employee expertise (data, information, and knowledge) as appropriate and consistent with our company's policies.
- Taking part in the refinement of collaboration plans and initiatives that will bring value to participants and lead to the longer-term sustainability of the regional Hub.

We are enthusiastic about collaborating with the Midwest Big Data Regional Innovation Hub team and being part of this novel forward-looking national initiative. We look forward to being invited and be part of the partnerships, and provide input in order to establish a successful hub.

Sincerely,

Nicholas Hatcher, Ph.D.
Materials Design Engineer
QuesTek Innovations, LLC
1820 Ridge Avenue
Evanston, IL 60201
Office: (847) 425-8226
Email: nhatcher@questek.com

CREATING MATERIALS BY DESIGN

1820 Ridge Avenue
Evanston, IL 60201
847.328.5800
847.328.5855 fax
www.questek.com

6/10/15

Ratna Babu Chinnam, Ph.D.
Director, Big Data & Business Analytics Group
Professor, Industrial & Systems Engineering Department
Wayne State University
4815 Fourth Street
Detroit, MI 48201

Re: Letter of Collaboration for Midwest Big Data Hub

Dear Dr. Chinnam,

Quicken Loans is pleased to provide this letter confirming our commitment to collaborate
with the proposed Midwest Big Data Innovation Hub (MBDH) team.   Our
company/organization is extremely interested in working with the universities driving
this valuable effort to establish a cross-cutting Big Data Hub focused on key Big Data
challenges and opportunities for the region.

In the hub and spoke design of this effort our company has a strong interest in several of
the domains below, but will work with the leadership team to add our expertise in the
spokes that most closely align with our business interests.

- Business analytics
- Network science

The success of such a Big Data Hub will depend on new collaborations being established
between the private and public sectors, including industry, academia, state and local
governments, national labs, foundations and non-profit organizations. Our company
recognizes this and looks forward to leveraging our expertise, established collaborative
programs and capabilities to complement and inform the MBDH's activities. We believe
we can collaborate in the following manner:

- Taking part, as resources allow, in workshops to develop a common
  understanding of regional Big Data needs for spokes of interest to us with an
  emphasis on data sharing and access requirements, workforce development and
  professional training requirements.
- Participate in creating Big Data sharing policies, Big Data licensing policies and
  guidelines and the development of Big Data best practices at the spoke, hub and
  national level
- As warranted and optimal, providing guest lecturers and presenters to seminar
  series and classes as well as mentors to student interns
- Sharing of employee expertise (data, information, and knowledge) as appropriate
  and consistent with our company's policies.

- Taking part in the refinement of collaboration plans and initiatives that will bring value to participants and lead to the longer-term sustainability of the regional Hub.

We are enthusiastic about collaborating with the Midwest Big Data Regional Innovation Hub team and being part of this novel forward-looking national initiative. We look forward to being invited and be part of the partnerships, and provide input in order to establish a successful hub.

Sincerely,

LisaJPhillip

Lisa Phillip
Director, Business Intelligence – Advanced Analytics (Foresight 20/20)
Direct: (313) 373-4307
LisaPhillip@quickenloans.com

June 19, 2015

Dr. Edward Seidel
Principal Investigator
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
1205 West Clark Street
Urbana, IL 61801

Re: Letter of Collaboration for Midwest Big Data Hub

Dear Dr. Seidel,

The Red River Valley Research Corridor (RRVRC) is pleased to provide this letter confirming our commitment to collaborate with the proposed Midwest Big Data Innovation Hub (MBDH) team. RRVRC is extremely interested in working with the universities driving this valuable effort to establish a cross-cutting Big Data Hub focused on key Big Data challenges and opportunities for the region.

In the hub and spoke design of this effort the Research Corridor has a strong interest in many of the domains below,

- Water-energy-food nexus
- Health sciences, Life sciences, Bioinformatics, Genomics
- Smart cities
- Digital agriculture (precision farming, phenomics, remote/sensing, sustainability)
- Advanced manufacturing
- Network science
- Business analytics

The success of such a Big Data Hub will depend on new collaborations being established between the private and public sectors, including industry, academia, state and local governments, national labs, foundations and non-profit organizations. RRVRC recognizes this and looks forward to leveraging our expertise, established collaborative programs and capabilities to complement and inform the MBDH's activities. The multi-state collaboration aspects of the proposed project are of particular importance from our perspective.

We will gladly collaborate in the following key areas:

- Taking part, as resources allow, in workshops to develop a common understanding of regional Big Data needs for spokes of interest to us with an emphasis on data sharing and access requirements, workforce development and professional training requirements.
- Taking part in the refinement of collaboration plans and initiatives that will bring value to participants and lead to the longer-term sustainability of the regional Hub.

We are enthusiastic about collaborating with the Midwest Big Data Regional Innovation Hub team and being part of this important forward-looking national initiative. We look forward to being invited and be part of the partnerships, and provide input in order to establish a successful hub.

Sincerely,

Delore Zimmerman, Ph.D.
Executive Director

delore@theresearchcorridor.com

Dr. Edward Seidel
Principal Investigator
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomuting Applications
1205 West Clark Street
Urbana, IL 61801

Re: Letter of Collaboration for Midwest Big Data Hub

Dear Dr. Seidel,

The Renaissance Computing Institute (RENCI) at the University of North Carolina Chapel Hill is pleased to provide this letter confirming our commitment to collaborate with the proposed Midwest Big Data Innovation Hub (MBDH) team. The MBDH, by bringing together the Big Data community in the Midwest, can be the focal point for Big Data resources for the area, including access to a variety of data sets of economic, social and scientific interest.

The integrated Rule Oriented Data System (iRODS) is open source data management software used by research organizations and government agencies worldwide to manage, share, make-discoverable and searchable distributed data sets in a federated manner. iRODS implements data virtualization, automates workflows, and enables secure collaboration. RENCI is home to the iRODS Consortium, and along with the Consortium has played a key role in releasing iRODS as a production-level distribution aimed at deployment in mission critical environments.

As you are aware, RENCI, along with the Georgia Institute of Technology, is submitting a proposal to the NSF to develop the South Big Data Innovation Hub (South BD Hub.) iRODS will be a critical part of the cross-cutting cyber-infrastructure for data management for the South BD Hub. We will be very pleased to work with the MBDH to make iRODS available for data federation for the NDS Labs. This cross-hub activity will be an important step in creating a national data infrastructure across all the BD Hubs.

We look forward to working together on this important national initiative for the Big Data community.

Sincerely,

Dr. Ashok Krishnamurthy
Deputy Director
Renaissance Computing Institute
100 Europa Drive, Suite 540,
Chapel Hill, NC 27517
Phone: 919-445-9643
email: ashok@renci.org

Division of Research and Economic Development

SAD 200, Box 2201
SDSU
Brookings, SD 57007-1998
Phone: 605-688-5642

Kevin.Kephart@sdstate.edu

South Dakota State University

June 16, 2015

Prof. Edward Seidel
Principal Investigator
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
1205 West Clark Street
Urbana, IL 61801

Re: Letter of Collaboration for Midwest Big Data Hub

Dear Prof. Seidel:

On behalf of South Dakota State University (SDSU), I am pleased to provide this letter confirming our intent to participate in the NSF Midwest Big Data Innovation Hub (MBDH) team led by the University of Illinois at Urbana-Champaign, Iowa State University, the University of Michigan, Ann Arbor, Indiana University, and the University of North Dakota. We are pleased to be part of a diverse group (public, private; small, large; R1, educational) of Midwest academic institutions working together to establish a cross-cutting "Big Data Hub" focused on key challenges and opportunities for the region in a novel public-private partnership.

Big data research and education will continue to be very important to our institution and other institutions that we collaborate with. The development of accessible, reliable, secure, and trustworthy datasets, and the building of communities around them through the use of efficient tools and services is critical to research and education as well as the economic development of the region. We are enthusiastic and committed to the success of this national initiative. The point of contact at SDSU for the MBDH effort will be our Vice President for Technology and Security, Dr. Michael Adelaine.

South Dakota State has significant resources that will be leveraged, and prove beneficial to the MBDH's success. This starts with the expertise and knowledge of our faculty, staff, and students – many of whom are already addressing significant challenges using big data in the current environment.

Numerous data intensive research and education programs and externally funded projects will benefit from, and in many cases, provide benefit to the MBDH. We have numerous projects creating and using big data collections, such as the Geospatial Science Center of Excellence and the EPSCoR-funded BioSNTR.

The synergies created by MBDH will result in new discoveries, innovation, economic development, and improved quality of life in the region and the nation. We look forward to being an integral member of the Midwest Big Data Innovation Hub should it be awarded to this team.

Sincerely,

Kevin D. Kephart, Ph.D.
Vice President for Research and Economic Development

CC: Michael Adelaine, Ph.D., Vice President for Technology and Security

May 20, 2015

Ratna Babu Chinnam, Ph.D.
Director, Big Data & Business Analytics Group
Professor, Industrial & Systems Engineering Department
Wayne State University
4815 Fourth Street
Detroit, MI 48201

Re: Letter of Collaboration for Midwest Big Data Hub

Dear Dr. Chinnam,

TechTown Detroit is pleased to provide this letter confirming our commitment to collaborate with the proposed Midwest Big Data Innovation Hub (MBDH) team.   Our company/organization is extremely interested in working with the universities driving this valuable effort to establish a cross-cutting Big Data Hub focused on key Big Data challenges and opportunities for the region.

In the hub and spoke design of this effort our company has a strong interest in several of the domains below, but will work with the leadership team to add our expertise in the spokes that most closely align with our business interests in the areas of health and life sciences, urban science/smart cities, advanced manufacturing and business analytics.

The success of such a Big Data Hub will depend on new collaborations being established between the private and public sectors, including industry, academia, state and local governments, national labs, foundations and non-profit organizations.   Our company recognizes this and looks forward to leveraging our expertise, established collaborative programs and capabilities to complement and inform the MBDH's activities. We believe we can collaborate in the following manner:

- Taking part, as resources allow, in workshops to develop a common understanding of regional Big Data needs for spokes of interest to us with an emphasis on data sharing and access requirements, workforce development and professional training requirements.
- Participate in creating Big Data sharing policies, Big Data licensing policies and guidelines and the development of Big Data best practices at the spoke, hub and national level
- As warranted and consistent with company policies, providing access to large data sets under terms and conditions that will allow us to protect our interests and that

of our stakeholders and yet, as part of a cross-hub effort, create the potential for new knowledge and opportunities of interest

- If applicable, hosting center researchers and students for extended stays and intellectual exchanges
- Sharing of employee expertise (data, information, and knowledge) as appropriate and consistent with our company's policies.
- Taking part in the refinement of collaboration plans and initiatives that will bring value to participants and lead to the longer-term sustainability of the regional Hub.

We are enthusiastic about collaborating with the Midwest Big Data Regional Innovation Hub team and being part of this novel forward-looking national initiative. We look forward to being invited and be part of the partnerships, and provide input in order to establish a successful hub.

Sincerely,

Paul Riser, Jr.
Managing Director of Tech-Based Entrepreneurship, TechTown Detroit
Email: paul@techtowndetroit.org
Phone: 313.399.7565

June 23, 2015

Ed Seidel
Director
National Center for Supercomputing Applications
University of Illinois
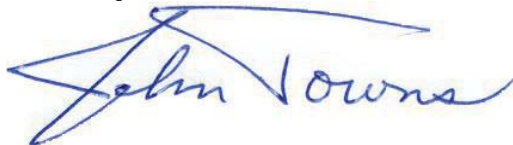
Dear Dr. Seidel:

The National Data Service (NDS), of which I am the Interim Director, is pleased to commit to collaborating with you on your proposal, , which you are submitting in response to the Big Data Regional Innovation Hubs (BD Hubs): Accelerating the Big Data Innovation Ecosystem solicitation (NSF 15-562) from the National Science Foundation. As you know, the NDS aims to further the digitization of communication among scientists and citizens so that discoverable and shareable data can enable collaboration and support repurposing for new discoveries and cross-disciplinary research enabled by data sharing across communities. Open, shareable data also promise to transform education, society, and economic development.

The work you propose in the *SEEDCorn* project will bring a critical set of collaborative activities into the NDS environment that supports our objectives. As part of this collaboration, the NDS will provide full access the NDS Labs environment for development of tools and services. NDS Labs is an environment where developers can prototype tools and capabilities that help build out the NDS framework and services. NDS will also provide access to the NDS Share environment for the developed tools and services to be transitioned into for production use by the community. NDS Share is a gateway to a number of community tools that are useful as part of an NDS ecosystem; we make them available to friendly users as a means for understanding how they can effectively be used and support the development of workflows to support community needs.

The NDS is extremely enthusiastic about the scope of your proposal, and fully supportive of your goals.

Sincerely,

John Towns
Interim Director, National Data Service
Executive Director, Science & Technology
National Center for Supercomputing Applications
University of Illinois

12 June 2015

Professor Edward Seidel
Principal Investigator
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
1205 West Clark Street
Urbana, IL 61801

Re: Letter of Collaboration for Midwest Big Data Hub

Dear Prof. Seidel:

On behalf of the University of Kansas I am pleased to provide this letter confirming our intent to participate in the NSF Midwest Big Data Innovation Hub (MBDH) team led by the University of Illinois at Urbana-Champaign, Iowa State University, the University of Michigan, Ann Arbor, Indiana University, and the University of North Dakota. We are pleased to be one of a diverse group (public, private; small, large; R1, educational) of midwest academic institutions working together to establish a cross-cutting "Big Data Hub" focused on key challenges and opportunities for the region in a truly novel public-private partnership. Big data research, education and development of services are all rapidly growing in importance to our institutions. The development of accessible, reliable, and trustworthy datasets, and the building of communities around them through the use of efficient tools and services is critical to research and education as well as the economic development of the region. We are enthusiastic and committed to the success of this national initiative. For our institution, the institutional lead and point of contact for the MBDH effort will be Dan Voss, Director of Research Computing.

The success of our Big Data Hub will bring together the public and private sector in new partnerships including industry, academia, state and local governments, national labs, foundations and non-profit organizations. All these organizations can be expected to have significant resources that can be leveraged to ensure the MBDH's success.
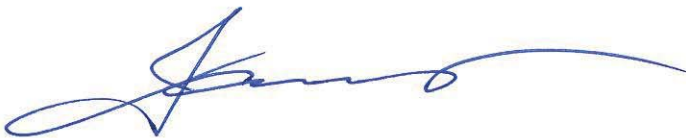
While we make no commitments of voluntary cost sharing (in compliance with the terms of the solicitation), the University of Kansas has significant resources that will be leveraged, and prove beneficial to the MBDH's success. This starts with the expertise and knowledge of our faculty, staff, and students – many of whom are already immersed in addressing grand challenges using big data and dedicated to developing education programs that address those challenges and related workforce development needs.

Numerous data intensive research and education programs and externally funded projects will benefit from, and in many cases, provide benefit to the MBDH. For example, the university has established a centralized Research File Storage, in collaboration with the university IT and the CIO, where research data can be created and stored and made available to others through Globus Online. Numerous projects support big data collections, such as the Center for Remote Sensing of Ice Sheets (CReSIS), a Science and Technology Center established by the NSF in 2005, with the mission of developing new technologies and computer models to measure and predict the response of sea level change to the mass balance of ice sheets in Greenland and Antarctica in projects such as KU'sBiodiversity Institute's Lifemapper software (funded by several NSF grants) which shows where Earth's organisms live today and might go tomorrow. Lifemapper has an agreement with the Global Biodiversity Information Facility to use the species data they aggregate from natural history museums and collections worldwide. KU's continuing education KU's Continuing Education is working with local companies to tailor a data science certification program which will be well aligned with the MBDH and can benefit from the collaborations and other hubs. KU has an NSF funded MRI for data intensive bioinformatics research and many other projects that will greatly benefit from the proposed MBDH.

KU is also part of the DataFOUR collaboration (Great Plains Network, Greater Western Library Alliance, University of Arkansas, and University of Missouri) to bring together technology, library and research experts from the region focused on advancing the goals; outreach, education, and training; strengthen infrastructure; and communication and advocacy. KU will act as a connector for activities in Kansas, across the MBDH and other hubs. These projects will collaborate with the MBDH effort, sharing knowledge, experiences and tools, and will benefit from the shared technology and best practices gained from working with so many different important stakeholders.

We fully expect a successful and dynamic hub will result in new discoveries, innovation, economic development and quality of life in the region and the nation. We look forward to being an integral member of the Midwest Big Data Innovation Hub should it be awarded to this team. With best regards, I remain,

Sincerely yours,

James W. Tracy, PhD
Vice Chancellor for Research
Professor of Pharmacology & Toxicology

June 22, 2015

Professor Edward Seidel
Principal Investigator
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
1205 West Clark Street
Urbana, IL 61801

Re: Letter of Collaboration for Midwest Big Data Hub Proposal in response to NSF 15-562 Program Solicitation

Dear Ed,

I am pleased to provide this letter confirming the tranSMART Foundation's commitment to collaborate with the Midwest Big Data Hub (MBDH) and its goals that include building a community and sustainable framework for Big Data collaboration in the Midwest and nationally.

The tranSMART Foundation, a 501(c)(3) nonprofit organization established in April 2013, has developed a global community of pharmaceutical, biotech, nonprofit, academic and government organizations around open source and open data translational biomedical research. Since incorporation, the tranSMART Foundation has established an effective governance model and framework for sustainability with an active community of more than 50 organizations supported by seventeen member organizations.

In the hub and spoke design of the proposed MBDH effort, the tranSMART Foundation has a strong interest in the "Health Sciences, Life Sciences, Bioinformatics, Genomics" domain. Your success will depend on establishing new collaborations that include industry, academia, state and local governments, national labs, foundations and non-profit organizations. The tranSMART Foundation recognizes this and looks forward to leveraging its expertise and experience in building a Big Data community in the Midwest. We believe we can collaborate in the following manner:

- Participate in workshops to develop a common understanding of regional Big Data needs for spokes of interest to us with an emphasis on data sharing and access requirements, workforce development and professional training requirements,
- Participate in creating Big Data sharing policies, Big Data licensing policies and guidelines, and the development of Big Data best practices at the spoke, hub and national level,
- Provide guest lecturers and presenters to seminar series and classes as well as mentors to student interns,
- Facilitate access to large "open data" sets as part of a cross-hub effort that creates the potential for new knowledge and opportunities of interest, and
- Take part in the development of collaboration plans and initiatives that will bring value to participants and lead to the long-term sustainability of the regional Hub.

I look forward to working with you and the MBDH team to build new Big Data partnerships across the Midwest region. I would be delighted to share our community building experience by serving on the MBDH Steering Committee.

Sincerely,

Keith Elliston, Ph.D.
Chief Executive Officer
tranSMART Foundation

Office of the Vice Chancellor for Research (MC 672)
310 Administrative Office Building
1737 West Polk Street
Chicago, Illinois 60612

June 10, 2015

Professor Edward Seidel
Principal Investigator
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
University of Illinois at Urbana-Champaign
1205 West Clark Street
Urbana, IL 61801

Re: Letter of Collaboration for Midwest Big Data Hub

Dear Professor Seidel:

The University of Illinois at Chicago (UIC) Office of the Vice Chancellor for Research (OVCR) is
pleased to provide this letter confirming our intent to participate in the NSF Midwest Big Data
Innovation Hub (MBDH) team led by the University of Illinois at Urbana-Champaign, Iowa State
University, the University of Michigan, Ann Arbor, Indiana University, and the University of North
Dakota. We are pleased to be one of a diverse group (public, private; small, large; R1, educational) of
Midwest academic institutions working together to establish a cross-cutting "Big Data Hub" focused on
key challenges and opportunities for the region in a truly novel public-private partnership. Big data
research, education, infrastructure, and the development of services are all rapidly growing in
importance to our institutions. The development of accessible, reliable, and trustworthy datasets, and the
building of communities around them through the use of efficient tools and services, is critical to
research and education as well as the economic development of the region. We are enthusiastic and
committed to the success of this national initiative. The UIC institutional leads and points of contact for
the MBDH effort will be Maxine Brown, director of the UIC Electronic Visualization Laboratory, and
Tanya Berger-Wolf, associate professor of Computer Science and director of the UIC Laboratory for
Computational Population Biology.

The success of the Midwest Big Data Hub will bring together the public and private sector in new
partnerships, including industry, academia, state and local governments, national labs, foundations and
non-profit organizations. All these organizations can be expected to have significant resources that can
be leveraged to ensure the MBDH's success.

While we make no commitments of voluntary cost sharing (in compliance with the terms of the
solicitation), UIC has significant resources that can be leveraged, and prove beneficial to the MBDH's

success. UIC is uniquely positioned as the engine of an urban Big Data Hub. While UIC acts locally (roughly one in 10 Chicagoans with a college degree is a UIC alumnus), it thinks globally (UIC is a designated Minority Serving Institution, given its diverse student population, with expectation of being designated a Hispanic Serving institution later this year). UIC is also the largest university in the Chicago area, with ~27,000 students, 15 colleges, and the nation's largest medical school. It has leading analytical, research and visualization expertise in Big Data problems, and many established academic, government and industrial partnerships in the Midwest, whose researchers can intellectually participate as either technology innovators or stakeholders and analysts in Big Data initiatives. UIC is also a founding member and a managing partner of StarLight, the world's largest communications exchange for Research & Education networks, which will facilitate the ability to access and share Big Data with global collaborators.

UIC can provide technical and intellectual leadership to help establish and manage the Hub, design the network infrastructure, develop the data acquisition, management, analytics, and visualization services, and encourage broader participation, outreach and workforce development.

We fully expect a successful and dynamic hub will result in new discoveries, innovation, economic development and quality of life in the region and the nation. We look forward to being an integral member of the Midwest Big Data Innovation Hub should it be awarded to this team.
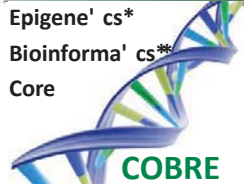
Sincerely,

Mitra Dutta, Ph.D.
Vice Chancellor for Research
UIC Distinguished Professor, Department of Electrical and Computer Engineering

UIC

Epigene' cs*
Bioinforma' cs**
Core

COBRE

Department of Basic Sciences
School of Medicine & Health Sciences
Room 1701
501 North Columbia Rd. Stop 9061
Grand Forks, ND 58202-9061
Phone: 701.777.2295
Fax: 701.777.2477

June 22, 15

Dr. Edward Seidel
Principal Investigator
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
1205 West Clark Street
Urbana, IL 61801

Re: Letter of Collaboration for Midwest Big Data Hub

Dear Dr. Seidel,

As the Director of the University of North Dakota Centers of Biomedical Research Excellence (COBRE) Epigenetics Bioinformatics Core (EBC), I am pleased to provide this letter confirming our commitment to collaborate with the proposed Midwest Big Data Innovation Hub (MBDH) team. The EBC is extremely interested in working with the universities driving this valuable effort to establish a cross-cutting Big Data Hub focused on key Big Data challenges and opportunities for the region.

In the hub and spoke design of this effort, our core and associated research groups have a strong interest in several of the domains below, and will gladly work with the leadership team to add our expertise in the spokes that most closely align with our scientific and service interests.

- Health sciences, Life sciences, Bioinformatics, Genomics

The success of the proposed Big Data Hub will depend on new collaborations being established between the private and public sectors, including industry, academia, state and local governments, national labs, foundations and non-profit organizations. The EBC recognizes this and looks forward to leveraging our expertise, established collaborative programs and capabilities to complement, contribute and inform the MBDH's activities. We believe we can collaborate in the following manner:

- Taking part, as resources allow, in workshops to develop a common understanding of regional Big Data needs for spokes of interest to us with an emphasis on data sharing and access requirements, workforce development and professional training requirements.
- Participate in creating Big Data sharing policies, Big Data licensing policies and guidelines and the development of Big Data best practices at the spoke, hub and national level.
- As warranted and optimal, providing guest lecturers and presenters to seminar series and classes as well as mentors to student interns.
- As warranted and consistent with our funding agency and university policies, providing access to large data sets under terms and conditions that will allow us to protect our interests and that of our researchers and yet, as part of a cross-hub effort, create the potential for new knowledge and opportunities of interest.
- Sharing of employee expertise (data, information, and knowledge) as appropriate and consistent with the EBC and University policies.
- Taking part in the refinement of collaboration plans and initiatives that will bring value to participants and lead to the longer-term sustainability of the regional Hub.

We are enthusiastic about collaborating with the Midwest Big Data Regional Innovation Hub team and being part of this novel forward-looking national initiative. We look forward to being invited and be part of the partnerships, and provide input in order to establish a successful hub.

Sincerely,

L. Keith Henry, PhD
Associate Professor
Founding Director of the UND Epigenetics
and Bioinformatics Core

UND NORTH DAKOTA   UND.edu

SCHOOL OF MEDICINE & HEALTH SCIENCES

Center for Comparative
Effectiveness Analytics
School of Medicine & Health Sciences
Room 2370
501 North Columbia Road Stop 9037
Grand Forks, ND 58202-9037
Phone: 701.777.2375
Fax: 701.777.0980

June 22, 2015

Dr. Edward Seidel
Principal Investigator
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
1205 West Clark Street
Urbana, IL 61801

Re: Letter of Collaboration for Midwest Big Data Hub

Dear Dr. Seidel,

University of North Dakota (UND) Center for Comparative Effectiveness Analytics (CCEA) is
pleased to provide this letter confirming our commitment to collaborate with the proposed
Midwest Big Data Innovation Hub (MBDH) team. CCEA is extremely interested in working
with the universities driving this valuable effort to establish a cross-cutting Big Data Hub
focused on key Big Data challenges and opportunities for the region.

In the hub and spoke design of this effort the CCEA has a strong interest in several of the
domains below, but will work with the leadership team to add our expertise in the spokes that
most closely align with our interests.

- Health sciences
- Health care analytics

The success of such a Big Data Hub will depend on new collaborations being established
between the private and public sectors, including industry, academia, state and local
governments, national labs, foundations and non-profit organizations. Our Center recognizes
this and looks forward to leveraging our expertise, established collaborative programs and
capabilities to complement and inform the MBDH's activities. We believe we can collaborate in
the following manner:

- Taking part, as resources allow, in workshops to develop a common understanding of regional
  Big Data needs for spokes of interest to us with an emphasis on data sharing and access
  requirements, workforce development and professional training requirements.
- Participate in creating Big Data sharing policies, Big Data licensing policies and guidelines and
  the development of Big Data best practices at the spoke, hub and national level

UNIVERSITY OF
NORTH DAKOTA

UND.edu

SCHOOL OF MEDICINE & HEALTH SCIENCES

Center for Comparative
Effectiveness Analytics
School of Medicine & Health Sciences
Room 2370
501 North Columbia Road Stop 9037
Grand Forks, ND 58202-9037
Phone: 701.777.2375
Fax: 701.777.0980

- As warranted and optimal, providing guest lecturers and presenters to seminar series and classes as well as mentors to student interns
- As warranted and consistent with CCEA policies, providing access to large data sets under terms and conditions that will allow us to protect our interests and that of our stakeholders and yet, as part of a cross-hub effort, create the potential for new knowledge and opportunities of interest
- If applicable, hosting center researchers and students for extended stays and intellectual exchanges
- Sharing of employee expertise (data, information, and knowledge) as appropriate and consistent with CCEA policies.
- Taking part in the refinement of collaboration plans and initiatives that will bring value to participants and lead to the longer-term sustainability of the regional Hub.

We are enthusiastic about collaborating with the Midwest Big Data Regional Innovation Hub team and being part of this novel forward-looking national initiative. We look forward to being invited and be part of the partnerships, and provide input in order to establish a successful hub. Sincerely,

Kimberly Burris
On Behalf of Raymond L Goldsteen

Raymond L. Goldsteen, DrPH
Professor and Director, Center for Comparative Effectiveness Analytics
raymond.goldsteen@med.und.edu

UNIVERSITY OF CALIFORNIA, SAN DIEGO

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SAN DIEGO SUPERCOMPUTER CENTER   9500 GILMAN DRIVE
(858) 534-5000   LA JOLLA, CALIFORNIA 92093-0505

June 23, 2015

Prof. Edward Seidel
Director, National Center for Supercomputing Applications
1205 West Clark Street
Urbana, IL 61801

Re: Letter of Collaboration for Midwest Big Data Hub

Dear Prof. Seidel (Ed):

As the PI of the West Big Data Innovation Hub, I am happy to write in support of your proposal
to establish the Midwest Big Data Innovation Hub (MBDH). Cross-hub partnerships will
provide mechanisms for sharing best approaches in utilizing and developing Big Data
technologies as well as shared lessons in governance and sustainability models. Through open
communication, jointly sponsored workshops and other research exchanges, the West-Midwest
hub partnership will strengthen each respective hub. By creating a larger innovation network
made of the four hubs, we can create opportunities for growing pilot projects and pipelines of
new innovation and Big Data researchers and practitioners.

SDSC will partner with NCSA and the MBDH to the support the National Data Service (NDS)
Labs environment for hosting community development pilots for all four of BD Hub projects.
SDSC will partner with NCSA to support the NDS Lab environment for hosting community
development pilots for all four BD Hub projects. There is great synergy between the NDS and
NDS Lab project and the regional Big Data Innovation Hub initiative. Both call for new
approaches in software and hardware architectures as well as the application of best of breed
practices towards new areas of science. SDSC will contribute resources and expertise especially
in the areas of storage, cloud technologies and data science. We anticipate working directly with
NCSA and other NDS project staff on new software for cloud peering, cloud compute cycle
exchange and data management pilots.

We look forward to working together on this important national initiative for the Big Data
community.

Yours sincerely,

Michael L. Norman
Director, San Diego Supercomputer Center
Distinguished Professor, Physics, UC San Diego

Office of the Vice President for Research
University of Cincinnati
PO Box 210663
Cincinnati, OH 45221-0663

540 University Hall
Phone: (513) 558-0026
Fax: (513) 558-0549

June 23, 2015

Dr. Edward Seidel
Principal Investigator
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
1205 West Clark Street
Urbana, IL 61801

Re: Letter of Collaboration for Midwest Big Data Hub

Dear Dr. Seidel,

As the Vice President for Research at the University of Cincinnati (UC), I enthusiastically write this letter of collaboration and support for your application to establish a Midwest Big Data Regional Innovation Hub. Your proposed Hub has great potential for developing new partnerships in Big Data focused on key challenges in the Midwest Region.

The University of Cincinnati's big data initiatives encompass a majority of all disciplines across campus, and has the support of the College of Engineering and Applied Sciences, the College of Arts and Sciences, the College of Medicine, the College of Education, Criminal Justice and Human Services, the Carl H. Lindner College of Business, the Office of Information Technologies and University of Cincinnati Libraries.

A key component of ongoing efforts in Big Data at UC includes the implementation of the Institute for Analytics Innovation (IAI), which is comprised of four spokes in the areas of crime and education, healthcare, manufacturing and supply chain and sensor analytics is a prime example of the interdisciplinary collaboration. The IAI's four founding colleges, Engineering and Applied Sciences, Education, Criminal Justice and Human Services, College of Medicine, and College of Business are committed to faculty hiring and creating an infrastructure built on existing strengths to provide the university a powerhouse of analytics faculty – leaders to generate new techniques in Big Data analytics and to fortify UC's ability to increase external funding through grants and contracts in key application areas of strength. The IAI is designed not to compete with any existing analytics program or research center, but to coordinate and harmonize analytics activities across campus. This initiative, much like the creation of an in-state network, serves as a force multiplier, leveraging significant campus strengths for research and education needs.

UC is home to a recently awarded NSA Cyberoperations Center of Excellence. This center spans four University units including the College of Engineering and Applied Sciences, the College of Arts and Sciences, the College of Education, Criminal Justice, and Human Services, and the Office of Information Technologies. The Center coordinates joint research and education efforts on the topic of Cyberoperations including data privacy across the University,

complementing the IAI, and is a founding member of the Cybersecurity Consortium of Southwestern Ohio.

UC is also part of a multi-institutional team that received a five-year, $19.7 million grant from the NIH to create a data coordination center for the Big Data to Knowledge (BD2K) initiative. UC's College of Medicine Department of Environmental Health, along with the Icahn School of Medicine at Mount Sinai in New York and the University of Miami (Florida), will form the BD2K-LINCS Perturbation Data Coordination and Integration Center.

UC has engaged in a long term partnership with the University of Chicago's Data Science for Social Good program, with two faculty from the College of Engineering serving as faculty mentors, one for both the 2014 and 2015 programs. In fall of 2015, both Cincinnati and Chicago will launch a course which incorporates Big Data research into the classroom environment paired with real partners. Planned partners for UC include the World Bank, and the FBI's overseas crime division. UC has also partnered with local industry in Cincinnati, leading to the creation of the Proctor and Gamble Simulation Center, the NSF Industry/University Cooperative Research Center for Intelligent Maintenance Systems, and many others. The City of Cincinnati's wealth of industrial leaders, include dunnhumbyUSA, the newly formed analytics think tank 84.51, the world headquarters of Kroger, Proctor and Gamble, Federated Department Stores, a large regional presence from General Electric and Northrup Grumman, a large medical research center including one of the top rated Children's Hospitals in the US, and regional offices for over 400 Fortune 500 companies. Leveraging industrial partnerships will be critical to the continued success of the BDHubs program, and the University of Cincinnati has a proven track record of success with its regional partners.

In addition to industry partnerships, the University of Cincinnati is willing to collaborate in workshops to develop common interests and understanding of regional needs, participate in creating Big Data sharing policies and best practices, host guest lecturers and presenters to speak to regional audiences about Big Data, and participate in development of educational materials and opportunities. Over the past three years we have developed new degree programs and certificates focused on Big Data and Data Science in the College of Engineering, the College of Education, Criminal Justice and Human Services, the College of Medicine and the College of Business. Our partners may benefit from the courses and educational materials that have been developed for these programs, as well as access to the students who are participating in these programs.

I wish you success with your application and look forward to continuing our collaborations for the success of the Hub.

With kind regards,

William S. Ball, MD
Vice President for Research
Sr. VP for Health Affairs
Dean, College of Medicine

June 22, 2015

Prof. Edward Seidel
Principal Investigator
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
1205 West Clark Street
Urbana, IL 61801

Re: Letter of Collaboration for Midwest Big Data Hub

Dear Prof. Seidel,

On behalf of the University of Nebraska-Lincoln (UNL), I confirm our intent to participate in the NSF Midwest Big Data Innovation Hub (MBDH) initiative led by investigators at the University of Illinois at Urbana-Champaign, Iowa State University, the University of Michigan, Ann Arbor, Indiana University, and the University of North Dakota. We are excited to be one of the R1 institutions in the Midwest, and one of a more diverse group of academic entities, working together to establish a cross-cutting "Big Data Hub" focused on developing new partnerships to address key challenges and capitalize on opportunities for the region in a truly novel public-private partnership. As a research intensive institution, dedicated to the mission of providing quality educational and extension services across the state of Nebraska, we recognize the growing importance of data research, education, and services to modern society. The development of accessible and reliable datasets, and the building of communities around them through sharing of expertise, tools, and services, is critical to research progress and talent development in our region. We are enthusiastic and committed to the success of the MBDH, as part of this national Hub initiative. For our institution, the institutional lead and point of contact for the MBDH effort will be Jennifer L. Clarke, Director, Computational Sciences Initiative, and Associate Professor, Department of Statistics and Department of Food Science and Technology.

The development of a sustainable Big Data Hub in the Midwest will bring together the public and private sector in new partnerships including industry, academia, state and local governments, national labs, foundations and non-profit organizations. UNL has a long and successful history of partnering with these organizations; the newly established Nebraska Innovation Campus (NIC) is evidence of this history. NIC is a research campus designed to facilitate new and in-depth partnerships between the University of Nebraska and private sector businesses. NIC is strategically located adjacent to UNL and provides access to talent, resources and success through UNL research faculty, students and facilities. As such, NIC and the UNL Office of Industry Relations can assist in engaging partners with significant resources that can be leveraged to ensure the MBDH's success.

While we make no commitments of voluntary cost sharing (in compliance with the terms of the solicitation), UNL has significant resources that will be leveraged, and prove beneficial, to the MBDH's success. This starts with the expertise and knowledge of our faculty, staff, and students, but continues to include existing centers and academic units involved in big data research and education. These include the Nebraska Center for Transportation, the Nebraska Center for Energy Research, the UNL Computational Sciences Initiative, the UNL Center for Advanced Land Management and Information Technology, and the Holland Computing Center.

Numerous data intensive research and education programs and externally funded projects will benefit from, and in many cases, provide benefit to the MBDH. For example, the Holland Computing Center (HCC) serves as part of the Light Hadron Collider (LHC) Computing Grid and provides data storage and analytical infrastructure for the high-energy physics community. The HCC is also part of the Open Science Grid and a participant in Globus. We are leading development of a high-throughput plant phenotyping facility with both greenhouse and field sites, and the construction of an associated database of images and experimental metadata. Our Center for Brain, Biology, and Behavior is a highly interdisciplinary center that brings together distinguished UNL faculty in the social, biological and behavioral sciences and engineering. This center's state-of-the-art facilities for neurological studies and highly multidisciplinary environment enable diverse studies to expand understanding of brain function and its effects on human behavior.

We also have significant and relevant contacts with industry and other stakeholders that we intend to leverage to create and grow partnerships that will support the MBDH as well as benefit from the MBDH. For example, we have strong relationships with the Nebraska Public Power District and local corporations such as Li-Cor that have agreed to participate in the MBDH.

We anticipate that the efforts of the MBDH leadership team will lead to a successful and dynamic hub of new partnerships that will foster new discoveries, innovation, and economic development in the region and the nation. We look forward to being an integral member of the Midwest Big Data Innovation Hub should it be awarded to this team.

Sincerely,

Prem S. Paul, D.V.M., Ph.D.
Vice Chancellor for Research and
    Economic Development

June, 15, 2015

Prof. Edward Seidel
Principal Investigator
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
1205 West Clark Street
Urbana, IL 61801

Re: Letter of Collaboration for Midwest Big Data Hub

Dear Prof. Seidel:

On behalf of the University of South Dakota, I am pleased to provide this letter confirming our intent to participate in the NSF Midwest Big Data Innovation Hub (MBDH) team led by the University of Illinois at Urbana-Champaign, Iowa State University, the University of Michigan, Ann Arbor, Indiana University, and the University of North Dakota. We are pleased to be one of a diverse group (public, private; small, large; R1, educational) of Midwest academic institutions working together to establish a cross-cutting "Big Data Hub" focused on key challenges and opportunities for the region in a truly novel public-private partnership. Big data research, education and development of services are all rapidly growing in importance to our institutions. The development of accessible, reliable, and trustworthy datasets, and the building of communities around them through the use of efficient tools and services is critical to research and education as well as the economic development of the region. We are enthusiastic and committed to the success of this national initiative. For our institution, the institutional lead and point of contact for the MBDH effort will be Douglas M. Jennewein, Research Computing Manager for the Office of Information Technology.

The success of our Big Data Hub will bring together the public and private sector in new partnerships including industry, academia, state and local governments, national labs, foundations and non-profit organizations. All these organizations can be expected to have significant resources that can be leveraged to ensure the MBDH's success.

While we make no commitments of voluntary cost sharing (in compliance with the terms of the solicitation), numerous data intensive research and education programs and externally funded projects will benefit from USD's participation in the MBDH.

USD researchers, for example, are at the forefront of next generation physics. In 2010, the Department of Energy established an Intensity and Cosmic Frontier Laboratory at what was formerly known as the Homestake Gold Mine in Lead, SD. Deep science at the frontier of

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physics is being undertaken at the Sanford Underground Research Facility, an infrastructure that extends 8,000 feet below the Earth's surface and is dedicated entirely to science. It is the only research facility like it in the world: USD researchers are working in collaboration with federal, state, industrial and international partners to advance work in two of the most important pursuits in modern science: elucidating the general properties of neutrinos and the nature of dark matter.

USD is the lead institution for South Dakota's NIH IDeA Networks of Biomedical Research Excellence award, which funds proteomics, genomics, and bioinformatics core facilities, as well as faculty and student fellowships for primarily undergraduate institutions around the state. USD is also a participating institution in South Dakota's recent NSF EPSCoR Research Infrastructure Improvement award: the South Dakota Biochemical Spatio-temporal NeTwork Resource (BioSNTR). The BioSNTR is a $20M transdisciplinary, multi-institutional program for systems bioscience research and education, integrating expertise in optical microscopy, biophysical chemistry, cell biology, gene expression analysis, informatics and engineering to study controlling cell function via understanding and manipulating the spatio-temporal coupling of signaling biochemistry to cell genetic regulatory networks.

USD has recently deployed a Science DMZ to support high-speed, unencumbered scientific data movement, connecting High Performance Computing resources and other research data hubs on USD's main campus to Internet 2 via South Dakota's Research, Education and Economic Development network.

We fully expect a successful and dynamic hub will result in new discoveries, innovation, economic development and quality of life in the region and the nation. We look forward to being an integral member of the Midwest Big Data Innovation Hub should it be awarded to this team.

Sincerely,

Mary T. Berry, Ph.D.
Interim Vice President for Research
The University of South Dakota

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June 9, 2015

Ratna Babu Chinnam, Ph.D.
Director, Big Data & Business Analytics Group
Professor, Industrial & Systems Engineering Department
Wayne State University
4815 Fourth Street
Detroit, MI 48201

Re: Letter of Collaboration for Midwest Big Data Hub

Dear Dr. Chinnam,

Urban Science is pleased to provide this letter confirming our commitment to collaborate with the proposed Midwest Big Data Innovation Hub (MBDH) team.   Our company/organization is extremely interested in working with the universities driving this valuable effort to establish a cross-cutting Big Data Hub focused on key Big Data challenges and opportunities for the region.

In the hub and spoke design of this effort our company has a strong interest in several of the domains below, but will work with the leadership team to add our expertise in the spokes that most closely align with our business interests.

- Health sciences, Life sciences, Bioinformatics, Genomics
- Urban science/Smart cities
- Network science
- Transportation
- Business analytics

The success of such a Big Data Hub will depend on new collaborations being established between the private and public sectors, including industry, academia, state and local governments, national labs, foundations and non-profit organizations. Our company recognizes this and looks forward to leveraging our expertise, established collaborative programs and capabilities to complement and inform the MBDH's activities. We believe we can collaborate in the following manner:

- Taking part, as resources allow, in workshops to develop a common understanding of regional Big Data needs for spokes of interest to us with an emphasis on data sharing and access requirements, workforce development and professional training requirements.

- Participate in creating Big Data sharing policies, Big Data licensing policies and guidelines and the development of Big Data best practices at the spoke, hub and national level
- As warranted and optimal, providing guest lecturers and presenters to seminar series and classes as well as mentors to student interns
- If applicable, hosting center researchers and students for extended stays and intellectual exchanges
- Sharing of employee expertise (data, information, and knowledge) as appropriate and consistent with our company's policies.
- Taking part in the refinement of collaboration plans and initiatives that will bring value to participants and lead to the longer-term sustainability of the regional Hub.

We are enthusiastic about collaborating with the Midwest Big Data Regional Innovation Hub team and being part of this novel forward-looking national initiative. We look forward to being invited and be part of the partnerships, and provide input in order to establish a successful hub.

Sincerely,

James A. Anderson
President and CEO, Urban Science Applications, Inc.
jaanderson@urbanscience.com

60 Hazelwood Drive
Champaign, IL 61820
Tel: 1-847-323-2968
Web: www.veriflowsystems.com

June 3, 2015

Dr. Edward Seidel
Principal Investigator
Midwest Big Data Regional Innovation Hub
Director, National Center for Supercomputing Applications
1205 West Clark Street
Urbana, IL 61801

Re: Letter of Collaboration for Midwest Big Data Hub

Dear Dr. Seidel,

Veriflow Systems, Inc. is pleased to provide this letter confirming our commitment to collaborate with the proposed Midwest Big Data Innovation Hub (MBDH) team.   Our company is extremely interested in working with the universities driving this valuable effort to establish a cross-cutting Big Data Hub focused on key Big Data challenges and opportunities for the region.

In the hub and spoke design of this effort our company has a strong interest in several of the domains below, but will work with the leadership team to add our expertise in the spokes that most closely align with our business interests:

- Advanced manufacturing

- Business analytics

In particular, Veriflow Systems produces software and services that enable rigorous verification of network security, providing enterprises with real-time understanding of their network infrastructure and the confidence that security and correctness policies (such as protection from attacks and data leak vectors) are preserved across all possible data flow paths. This is a new kind of analytics of network infrastructure. We are also working with a major midwest-based Fortune 500 firm to develop this technology for next-generation cybersecurity for manufacturing.

The success of such a Big Data Hub will depend on new collaborations being established between the private and public sectors, including industry, academia, state and local governments, national labs, foundations and non-profit organizations. Our company recognizes this and looks forward to leveraging our expertise, established collaborative programs and capabilities to complement and inform the MBDH's activities. We believe we can collaborate in the following manner:

- Taking part, as resources allow, in workshops to develop a common understanding of regional Big Data needs for spokes of interest to us with an emphasis on data sharing and access requirements, workforce development and professional training requirements.

- Participate in creating Big Data sharing policies, Big Data licensing policies and guidelines and the development of Big Data best practices at the spoke, hub and national level

- As warranted and optimal, providing guest lecturers and presenters to seminar series and classes as well as mentors to student interns

- If applicable, hosting center researchers and students for extended stays and intellectual exchanges

- Sharing of employee expertise (data, information, and knowledge) as appropriate and consistent with our company's policies.

- Taking part in the refinement of collaboration plans and initiatives that will bring value to participants and lead to the longer-term sustainability of the regional Hub.

We are enthusiastic about collaborating with the Midwest Big Data Regional Innovation Hub team and being part of this novel forward-looking national initiative. We look forward to being invited and be part of the partnerships, and provide input in order to establish a successful hub.

Sincerely,

P. Brighten Godfrey
CEO, Veriflow Systems, Inc.
650-814-1962
bgodfrey@veriflowsystems.com

Ed Seidel
Director, National Center for Supercomputing Applications
University of Illinois

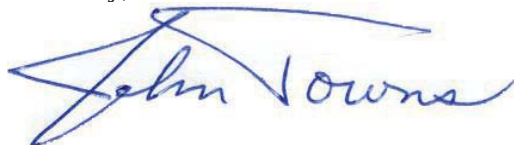Re: Letter of Collaboration for Midwest Big Data Hub

Dear Dr. Seidel:

It is with great enthusiasm that I write as PI and Project Director of the NSF XSEDE program to express XSEDE's intent to collaborate with you on your proposal *BD Hubs: Midwest: "SEEDCorn: Sustainable Enabling Environment for Data Collaboration* that you are proposing in response to the NSF Big Data Regional Innovation Hubs (BD Hubs): Accelerating the Big Data Innovation Ecosystem (NSF 15-562) solicitation. Supported by National Science Foundation grant number ACI-1053575, XSEDE is a single virtual system that scientists can use to interactively share computing resources, data, and expertise to enhance the productivity of scholars, researchers and engineers. Its integrated, comprehensive suite of advanced digital services is designed to federate with other high-end facilities and with campus-based resources, serving as the foundation for a national e-science infrastructure ecosystem.

The *SEEDCorn* project will make critical steps toward establishing regional data cyberinfrastructure and creates an important opportunity to connect data and data services with analysis resources available via XSEDE. It is anticipated that this project will become a Service Provider in XSEDE creating new opportunities for enhancing the productivity of those involved in data intensive research. XSEDE commits to assisting this project through the process of federating with XSEDE and stands ready to apply staff resources in that process and in supporting research teams leveraging your services and XSEDE resources with staff from our Extended Collaborative Support Service (ECSS).

Given the alignment of objectives, I am pleased to commit XSEDE to work with the *SEEDCorn* project to further develop the nation's cyberinfrastructure ecosystem and to further our goal of improving the productivity of the broad range of research communities XSEDE supports. We look forward to this collaboration that supports the science goals of both the *SEEDCorn* project and XSEDE.

Sincerely,

John Towns
PI and Project Director, XSEDE
Executive Director, Science & Technology
National Center for Supercomputing Applications
University of Illinois