



Digital Agriculture Community

Outline

- Spoke/Community/Priority Area
 - Website & Listserv
 - MBDH Summer School
 - Precision Livestock Farming /PFL
- UASPSE Funded Spoke Project
 - Overview
 - Activities
 - Funding to Others
- Future & Questions





Accelerating the Big Data Innovation Ecosystem

About ▾ News and Events ▾ Blog Priority Areas ▾ Projects ▾ Get Involved ▾

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Digital Agriculture

SPOKE = COMMUNITY = PRIORITY AREA



At Iowa State University:

Sarah Nusser, coPI for MBDH

Joe Colletti, Digital Agriculture Lead

Carolyn Lawrence-Dill, James Reecy,
and Hriday Rajan, contributors.



Hridesh Rajan, Organizer

2018 Digital Agriculture Track

HT Phenotyping	Baskar Ganapathysubramanian
Imaging Sensors	Jianfeng Zhou
Sensing for Plant and Soil	Yufeng Ge
Livestock Screening	Joshua Peschel

Annual 4 days, with topical focus last day

All sessions are in Great Room, Memorial Union.

1

Registration
 Welcome
 Invited Talk #1
 Invited Talk #2
 Break
 Introduction to Statistics
 Lunch
 Introduction to Python - Part I by Steven M. Kautz
 Break
 Introduction to Python - Part II by Steven M. Kautz

All sessions are in Great Room, Memorial Union.

2

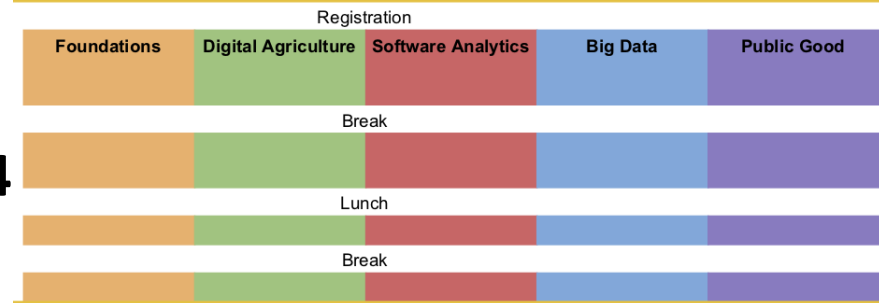
Registration
 Introduction to R - Part I by Jarad Niemi
 Break
 Introduction to R - Part II by Jarad Niemi
 Break
 Invited Talk #3 Lunch
 Break
 Visualization - Part I by Jarad Niemi
 Break
 Visualization - Part II by Jarad Niemi

All sessions are in Great Room, Memorial Union.

3

Registration
 Applied Machine Learning - Part I by Jin Tian
 Break
 Applied Machine Learning - Part II by Jin Tian
 Invited Talk #4 Lunch
 Scalable Tools - Part I by Robert Dyer
 Break
 Scalable Tools - Part II by Robert Dyer

4



Website
Listserv

<https://digital.ag.iastate.edu/>
mbdh-digiag@iastate.edu

...to coordinate activities in Digital Agriculture

Midwest Big Data Hub

Midwest Digital Agriculture
Community

Search



Join About ▾ Projects Presentations Resources Announcements Events



Join



Projects



Resources

Midwest Big Data Hub

Midwest Digital Agriculture Community

Growth area – Precision Livestock Farming – PLF

Dec. 6, 2018 Workshop at Iowa State– Scoping Approach
with Key Public/Private Stakeholders

Ag & Vet Med co-sponsored

5 featured speakers – EU; FFAR; NIFA; ARS; Industry

8 focused talks

What's next – issues & opportunities

Midwest Big Data Hub

Midwest Digital Agriculture Community

The **Digital Agriculture Community** is a growing network of partners, devoted to building partnerships and resources that will address emerging issues in precision agriculture, ecosystem management and services, biosciences, socio-economic impacts, and data-related issues in the agricultural ecosystem. You are invited to learn more about our work, and join our community to receive more news and information about our activities.

Digital Agriculture is one of nine thematic communities under the [Midwest Big Data Hub](#) (MBDH). The MBDH is a growing network of partners investing in data and data sciences to address grand challenges for society and science. Anyone is welcome to join these efforts.

In 2016, the National Science Foundation funded a collaborative [MBDH Spoke project in the digital agriculture area](#), titled "**Digital Agriculture - Unmanned Aircraft Systems, Plant Sciences and Education.**"



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**NSF Big Data
Midwest Region: Spoke Award
Digital Agriculture - Unmanned Aircraft
Systems, Plant Sciences & Education
Award # 1636865**



Current Leadership Team:

PI: Aaron Bergstrom, U of North Dakota

Co-PI: Jennifer Clarke, U of Nebraska

Co-PI: Joe Colletti, Iowa State University

Co-PI: R. Kurt Barnhart, Kansas State University - Salina



Project Scope: Focus on . . .

- Two knowledge domains critical to agriculture: Unmanned Aircraft Systems & Plant Sciences
- Best practices for transport, storage, dissemination, & analysis of big data
- Cross-Hub connections; leveraging /coordinating; & information sharing & education

1. Unmanned
Aircraft Systems
(UAS)

2. Plant
Sciences,
Phenomics,

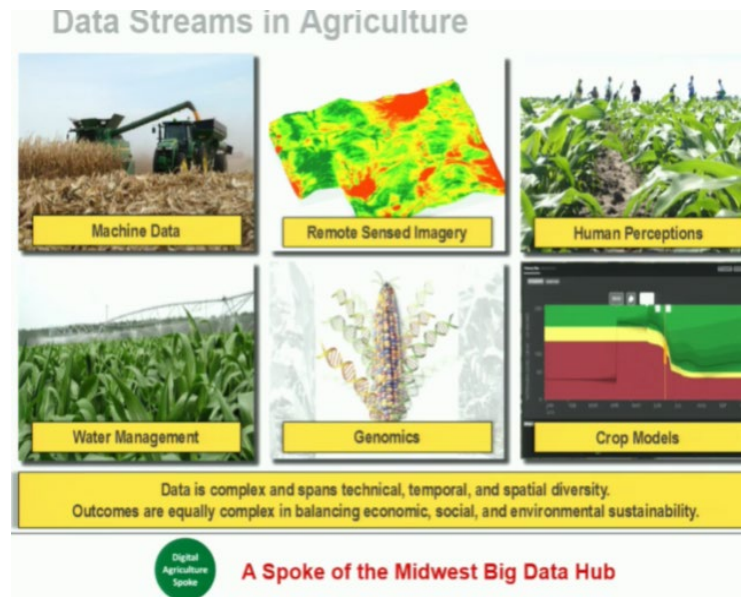
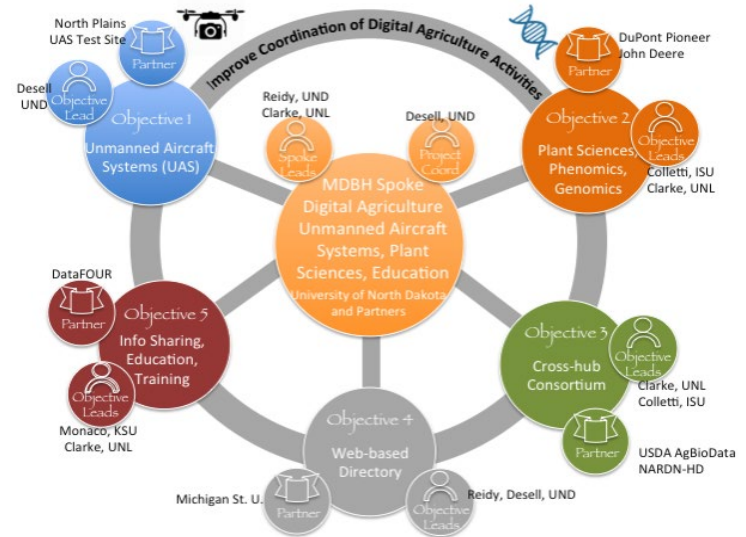
3. Cross-hub Consortium: Data Collection, Management, Analysis, Sharing

4. Leveraging and Coordinating: Resource Directories, Grant Development

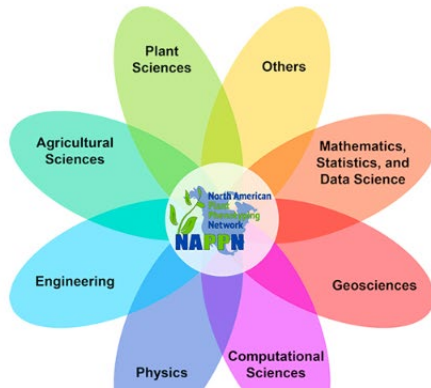
5. Information Sharing/Education: Webinars and Best Practices

Five Interlinked Objectives

1. Harmonize and automate BD lifecycles unmanned aircraft systems (UAS);
2. Harmonize and automate BD lifecycles in plant sciences, phenomics, & genomics;
3. Establish cross-hub consortia in plant sciences, phenomics, & genomics;
4. Develop a web-based directory of resources to improve coordination; and
5. Information sharing/education and training at all levels



NAPPN and Phenome



News

We're Published!

The Plant Phenome Journal

Commentaries

NAPPN: Who We Are, Where We Are Going, and Why You Should Join Us!
April Agre-Correll, Jennifer Clarke, Noah Folgar, Matt A. Gilson, Conlyn J. Lawrence-Dill, and Angella Lorenzer

2019 NAPPN Plant Phenotyping Early Career Award Winner Announced

James Schnable has been named the inaugural recipient of the NAPPN Plant Phenotyping Early Career Award.

[More Info](#)



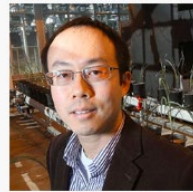
Frank Dohleman
2019-2021

Climate Corporation



David Ertl
2018-2021

Iowa Corn



Jian Jin
2018-2020

Purdue University



Carolyn Lawrence-Dill
Chair
2018-2020

Iowa State University



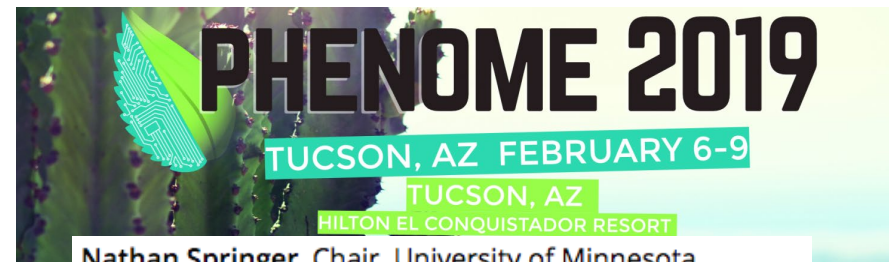
Andrew Leakey
2019-2021



Charlie Messina
2018-2020



Chris Topp
2018-2021



Nathan Springer, Chair, University of Minnesota

Jennifer Clarke, Co-Chair, University of Nebraska-Lincoln

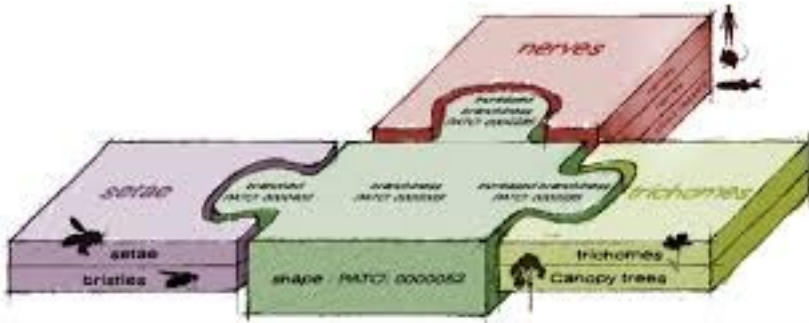
Chris Topp, Past Chair, Danforth Center

Sally McKenzie, Pennsylvania State University

Ivan Baxter, Danforth Center

David Ertl, Iowa Corn

Presentations, Seminar Series, Etc.



IOWA STATE UNIVERSITY **Biological Ontologies**

SUMMER SEMINAR SERIES PLANT PHENOMICS PHRIDAYS



Overview:

Challenges and opportunities in the plant sciences are being addressed using novel approaches from diverse disciplines. Speakers include statisticians, biologists, data scientists, and engineers.

the **Genomes** to **Fields** initiative

USDA NIFA FACT Workshop
High Throughput, Field-Based Phenotyping Technologies
for the Genomes to Fields (G2F) Initiative



IOWA STATE UNIVERSITY **Metagenomics Mondays**

BIG DATA FOR (SM)ALL FARMERS
FEBRUARY 26 - 27, 2018
IOWA STATE UNIVERSITY
College of Agriculture and Life Sciences

GREAT LAKES ECONOMIC FORUM
MONTREAL | MAY 3-5, 2018
GREATLAKESECONOMICFORUM.COM

UASPSE All Hands Meeting UNL, September 2018



Database, 2018, 1–22
doi: 10.1093/database/bay088
Original article

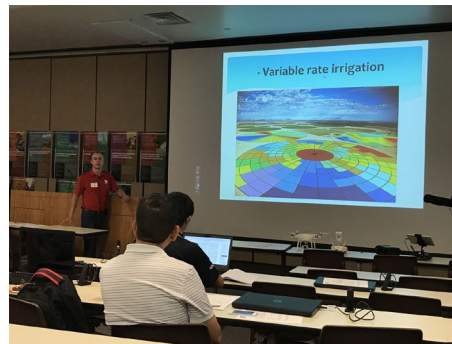


Building Cyberinfrastructure for Multidisciplinary, Multiscale AgroInformatics

Original article

**AgBioData consortium recommendations for
sustainable genomics and genetics databases
for agriculture**

James (Jim) Wilgenbusch
Minnesota Supercomputing Institute
University of Minnesota



- UAS hands-on workshop
- External Advisory Board meeting
- Presentations and Poster Session
- Structured collection of feedback/suggestions from attendees



MBDH Digital Agriculture Award : Seed Grants

Buckmaster and Krogmeier (Purdue): Support for Build and Deployment of Four ISOBlue 2.0 Devices to Demonstrate Interoperability and Democratization of Machine Data from University Research Farms

Kazic and Kharismawati (Missouri): Computer Vision for Segmenting and Tracking Individual Maize Plants from Drone Imagery in Field Environments.

Choudhury, Stoerger, Samal, and Award (Nebraska): Development and Dissemination of a Benchmark Dataset to Stimulate 3D Image-based Plant Phenotyping Research

Xu, Qiu, Schnable, Ge, Jin, and Cui (Nebraska): Pipeline development of automatic feature extraction for better and high-throughput plant phenotyping.

Demir and Yildirim (Iowa): Integrated Data Framework for Agricultural Flood Damage and Loss Analysis.

Lorence (Arkansas): Meetings towards a NSF Research Coordination Network (RCN) Proposal To Further the Mission of the NAPPN

Fasano (Monmouth U, IL): High-Spatial-Resolution Measurements of CO₂ and VOC's at the field-level—prototyping shareable hardware and data sets for agronomic systems

Thompson (Michigan State): Enabling Emergent Analysis and Wide-Spread Reuse of Genomes 2 Fields Data

All Awardees Required to Attend and Present at Award All-Hands Meeting

UASPSE : International Collaboration Funding

- \$18,000 in Foreign Travel Funds for Collaboration
- Per NSF Funding Requirement
 - One UASPSE PI/Co-PI could use these funds for one trip
 - Remaining funds must be allocated to Early Career Researcher
- Early Career Mini-Award Program for Foreign Collaboration:
 - ***Maaz Gardezi*** – Assoc. Professor - South Dakota State University
 - ***Matthew Carroll*** – Grad Student – Iowa State University
- Remaining Funds put toward Digital Ag collaboration with Arrell Food Institute – **About \$8K-\$10K**



AT THE UNIVERSITY *of* GUELPH

Arrell Food Institute

The Arrell Food Institute at the University of Guelph connects food research and expertise across all fields of study with Canadian and global partners to support sustainability, economic growth, and security in the food supply chain from fork to field.

The Institute's **Food from Thought** Program is a research program funded in part by a \$76.6 million grant from the Canada First Research Excellence Fund.

Focus areas:

- Transforming agriculture's impact on biodiversity
- Sustainably intensifying production
- Enhancing food and livestock health

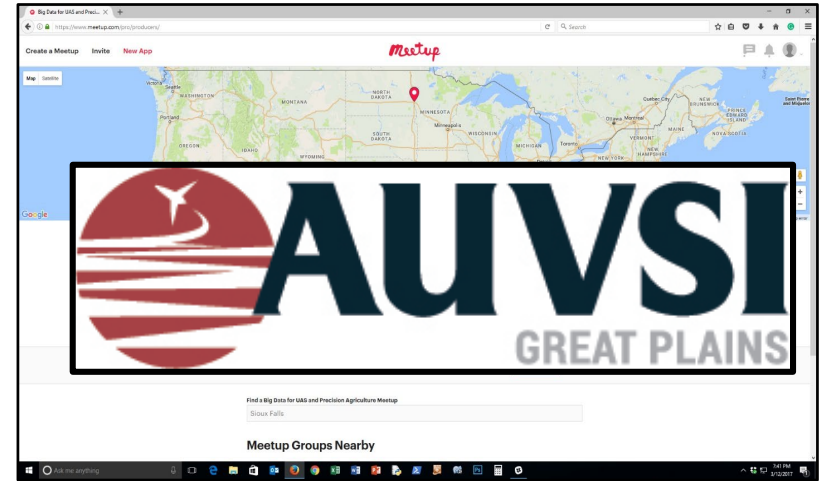
Overarching goal: Meeting with UASPSE members to draft FFAR proposal(s) -
End of June 2019

UASPSE Current & Approaching Events

- **Spring Semester 2019 - Ongoing:**
Unmanned Data Mondays Webinar
- **June 24-27, 2019:**
Agri-Food Excellence Symposium
Co-Hosted by Arrell Food Institute and Food For Thought
- **August 21, 2019:**
Digital Agriculture All-Hands Meeting
Hosted by KSU – Salina
- **September 10-12, 2019**
UAS and Digital Ag Panel Discussions
Big Iron Ag Expo
- **December 2019 – *Follow Up Meetings with AFI***

Digital Agriculture: Unmanned Aircraft Systems, Plant Sciences & Education

Questions?





Digital
Agriculture
Community

Outline

- **Future Digital Ag Community**
- **Questions about Digital Ag Community?**

