NCSA Research Fellows 2016
Ideas Acceleration Workshop

NCSA Major Programs
Danny Powell
Midwest Big Data Hub
Vlad Kindratenko
Innovative Systems Laboratory
Innovative Systems Lab

- 6 TB HDDs
- Kingston 240 GB PCIs SSD
- 128 GB RAM
- LSI Logic SAS3008 PCIe Serial Attached SCSI controller
- Intel Xeon E5-2650 v3 CPU
- Dual port 10 Gigabit server adapter
- 1Gb switch
- QDR IB switch
- ironic
- openstack CLOUD SOFTWARE
- ceph
- keystone, glance, horizon, ...
- netron, cinder, swift
- nova-compute
- horizon, ...
- glance
- ...
Culture and Society
Donna Cox (donnacox@illinois.edu)

Laboratory for Critical Technologies
- Newest group to Culture and Society
- Focus is to consider how humans are engineered and disrupted by software; how software is disrupted and engineered by humans

Institute for Computing in the Humanities & Social Sciences (ICHASS)
- Emphasis on identifying, creating and adapting computational tools that accelerate education and research
- Creates learning environments/spaces for digital discovery
Culture and Society

eDream Institute (Emerging Digital Research and Education in Arts Media)
- Creative Production
  - Enable emerging, interdisciplinary arts in which technology plays an essential role
- Collaborative Research
  - Identify hybrid research problems
- Education and Curricula

Advanced Visualization Laboratory (AVL)
- Creates high-res, cinematic visualizations of scientific data
- Develops and uses unique cyberinfrastructure:
  - Visualization Pipelines, Customized software, Visualization tools, and Production Methods
Seid Koric
Economic and Societal Impact/ Private Sector Program
Fellows Idea Acceleration Workshop (ESI/PSP)
Seid Korić, Technical Program Manger, Associate Adjunct Prof. MechSE

HPC Expertise
- Multiphysics Software (ISV and Open Source)
- Extreme Scalability
- Sparse Solvers
- Code Profiling and Optimization

Domain Expertise
- Multi-physics/scale Modeling in Manufacturing and Material Processing
- Biomechanics
- Nuclear Engineering
- Combustion
- Molecular Dynamics ...

Proposals and Beyond
- NCSA Faculty Fellowships
- Industry
- NSF/NIH/NIST
- Mixed .gov/.com (NDEMC, DMDII, AFFOA)
- Project Management
- Business Development
Kenton McHenry
Innovative Software and Data Analysis
National Data Service
• Research & Development
• Reusable software tools & frameworks for data analysis
• Bridging and amplifying efforts across different projects
• New custom software tools & frameworks
The National DATA SERVICE

- National effort to bring together R&D efforts surrounding data
- In collaboration with the RDA implementing standards and protocols
- Towards a world where it is easier to search, publish, link, and reuse data of all kinds
- From the Internet to the “Datanet”
Jay Alameda
XSEDE
This is XSEDE.

XSEDE gives scientists, engineers, and researchers a pathway to digital science resources like powerful supercomputers, massive collections of data, and custom-made tools that are now critical to the success of science.

XSEDE integrates these resources and services, makes them easier to use, and helps more people use them. XSEDE helps you address the most important and challenging problems facing the nation and world.
What you can do with XSEDE

GET TIME: Use custom-made coordinated allocation system to get access to NSF high-end resources like Stampede, Comet, SuperMIC and more. xsede.org/allocations

GET HELP: Experts from XSEDE’s Extended Collaborative Support Service (ECSS) will work closely with your team on visualization, code optimization, and other challenges. xsede.org/ecss

GET TRAINING: Take advantage of classes in HPC, visualization, data management, distributed and grid computing, science gateways, and more. xsede.org/training

GET ENGAGED: Students can gain real-world knowledge and development experience, and be encouraged to pursue advanced degrees and professional careers in STEM. xsede.org/web/guest/engagement

UNDER THE HOOD, SPECS AND DETAILS

Advanced distributed systems architecture, rooted in user requirements and hardened by systems engineering. Includes expansive list of more than 200 pieces of open-source software.

Internet2 and XSEDEnet configured private network between XSEDE service provider sites across a shared 10G bandwidth.

XSEDE User Portal allows user to manage jobs, report issues and analyze and visualize results. Portal now available as free apps in Google Play and Apple App store.

Advanced cybersecurity allows easy access to users and prevents attacks.

The Campus Champions program brings together XSEDE and various campuses to promote cyberinfrastructure in education and research.

Led by NCSA, XSEDE is a ground-breaking distributed cyberinfrastructure project funded by the National Science Foundation. Other partners include: Cornell, Indiana, Jiftech, NCAI, NICS, Ohio State, Pittsburgh, Purdue, Rice, SDSC, Shodor, SURA, TACC, Berkeley, University of Chicago, and UVA.

Questions? info@xsede.org
Have you reached a plateau in your computational simulations?

Would you like to see if your code can run 10, 50 or even 100 times faster?

Do you want to see if advanced computing can help you in your work?

XSEDE’s Extended Collaborative Support Services (ECSS) program has experts that can provide dedicated support for up to a year at no cost to your project.

Expertise available in many areas

- Performance analysis
- Petascale optimization
- Efficient use of accelerators
- I/O optimization
- Data analytics
- Visualization
- Science gateways
- Work and data flow systems
- Expertise with new domain areas such as digital humanities

ECSS staff have domain expertise and advanced degrees. They are scientists as well as cyberinfrastructure experts.

www.xsede.org/ecss
help@xsede.org

XSEDE
Extreme Science and Engineering Discovery Environment

NSF
Greg Bauer
Blue Waters
Blue Waters Science and Engineering Application Support

- Basic and Advanced Application Support on Blue Waters.
- Work with projects on or moving to Blue Waters.

- Domain Specialists
  - CFD / Solvers
  - Chemistry
  - Numerical Methods
  - BioInfo
  - HPC Generalists

- Interests
  - Performance and Scaling
  - Workflows