BD Hubs: Midwest: "SEEDCorn: Sustainable Enabling Environment for Data Collaboration"
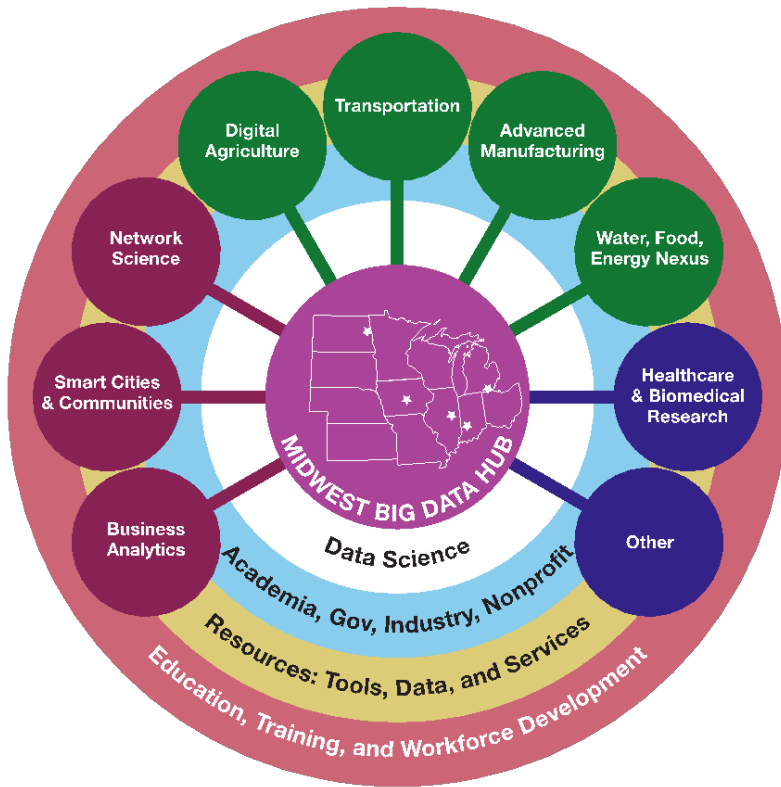
Midwest Big Data Hub
Accelerating the Big Data Innovation Ecosystem

Network Science Spoke

**Caterina Scoglio
Kansas State University
(on behalf of the Spoke Leads)**

Network Science is a thematic spoke in the Midwest Big Data Hub

It may be the only Network Science Spoke in the national BD effort

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Key Contacts and Partners

Spoke Leaders

- Bernice Pescosolido, Sociology & IUNI, Indiana University

- Caterina Scoglio, Electrical and Computer Engineering, Kansas State University

- Alex Yahja, NCSA, University of Illinois Urbana-Champaign

Stakeholders

- Academia (e.g, IUNI)

- Pharma / Biotech (e.g., Eli Lilly)

- Healthcare Research Organizations (e.g., Regenstrief Institute, Inc.)

- Non-Profit Foundations (Bring Change 2 Mind)

- Government (e.g., NIH; public health departments)

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Challenges of Network Science

- Network science is more than an analytic method.

- Network science focuses on phenomena in an of itself – the interconnectedness of all things.

- Network science is an *explanatory perspective with basic principles and theoretical frameworks*.

- Network science uses *relational data* often requiring different conceptualization, methods of data collection, file formats and data construction.

- Network data require *novel analytic techniques* that take into account dependence among nodes rather than classic statistics which is predicated on independence of cases.

Focus of Network Science Spoke

- To provide the network science data, analytic tools, workshops and education, and public dissemination of materials relevant to *relational* Big Data.

- To collaborate in ongoing projects through the NCSA and leverage big data to make the network models more robust and allow a much larger scale of data mining and predictive network modeling.

- To develop partnerships in the region to enable new (networked) ways of addressing regional problems in health, transportation, education, energy, etc.

- To harvest social/professional network data and detect communities from direct and indirect sources to engage and empower communities scientifically and economically.

- To assist the MBDH Executive Director and other spokes with the organizational network data gathering and analysis to support decision-making and project outcomes.

- To provide training in network science – both theoretical and applied – integrating network science and data science approaches.

Proposed Supportive Activities

- Collect, acquire and integrate human and non-human network data from the individual to the global scale.

- Support the development of data infrastructures and collaborative computational platforms enabling the production of knowledge from data in a privacy-preserving manner.

- Define the basic algorithms and deploy modeling computational platforms and data sharing points that will serve the scientific and policy-making community.

Collaborative Activities

- The MBDH Network Science spoke was instrumental in the development of spoke proposals to [NSF Solicitation #16-510](#)

  - Collaborating with MIDWEST: Collaborative: **Advanced Computational Neuroscience Network (ACNN)** – PI Franco Pestilli, Indiana University et al (see lightning talk)

  - Collaborating with BD Spokes: SPOKE MIDWEST**: Sharing Computational Models of Contagion for Health Applications** – PI Caterina Scoglio (see lightning talk)

  - Collaborating with **Networked Resilience of Communities in Face of Natural and Social Emergencies** – PIs Marshall Scott Poole and Alex Yahja, University of Illinois Urbana Champaign

Network Science Summer Courses

IUNI is teaching two courses in the University of Michigan's Inter-University Consortium for Political & Social Research (ICPSR), 2016 [Summer Program in Quantitative Methods of Social Research](#):

1) [Introduction to Network Analysis: Study Design and Methods](#)
       (Location: Bloomington, IN; Dates: July 25-29)
2) [Egocentric Network Analysis](#)
       (Location: Bloomington, IN; Dates: July 18-22)

Opportunity: The Network Science Spoke proposes to use CCC funds, if applicable, and/or request Hub funds to provide partial tuition scholarships to scholars based in the Midwest Region for these courses, and any of the other ICPSR course offerings related to network science (7 total).

Contact: amccrani@indiana.edu

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