



Update on the Science of Science & Innovation Policy

Julia Lane



Overview

- Program Status
- Current Context
- Scientific Challenges and Approach
- Research and Findings
- Visibility
- Next Steps



Program Status

- Background
 - program established in 2005, \$8-10 million/year
 - Explicitly interdisciplinary – economists, sociologists, psychologists, political scientists, anthropologists, computer scientists, domain scientists
 - Goals: Understanding (theories); measurement (models, metrics, datasets); community of practice (academics, practitioners)
- Current status
 - 75 awards made in three solicitations since 2007
 - Active engagement with Science of Science Policy Interagency group



Current Context: Very High Profile

- Investment in Science
 - American Recovery and Reinvestment Act
 - The National Academy of Sciences Speech, April 2009
- Openness and transparency
 - data.gov; open.gov; etc.
- Evidence based policy
 - Joint memo on “Science and Technology Priorities for the FY2011 Budget” :
Science of Science Policy (is the only program listed by name)
- Accountability
 - ARRA Reporting Guidelines
 - Putting Performance First: Replacing PART with a new performance improvement and analysis framework





Why this program is important for Science of Team Science Methods Used

- Qualitative/ Case Studies
 - Describe complex processes
 - Formulate hypotheses
- Quantitative and Statistical Methods
 - Build new linked datasets on researchers, grants, patents, publications, citations and firms and workers
 - Develop new tools for describing complex outcomes
 - Develop new models to tease out marginal impact of funding
- Computational approaches
 - Cyberinfrastructure => vast amounts of heterogeneous data on individuals
 - Visual analytics



Why this program is important for Science of Team Science

- Science Policy
 - Data Infrastructure
 - Science agencies have proposal and award administration systems => no systematic frame of individuals “touched” by science funding (New STAR METRICS)
 - Heterogeneous sources of outcomes
 - Scientific Attribution
 - Name disambiguation
 - Global enterprise
- Innovation Policy
 - Data Infrastructure
 - Innovation within organizations
 - Scientific Frame



Examples of Research

Economics

- Azoulay/Graff-Zivin Superstar Scientists
- Hobijn/Comin Technology Adoption and Diffusion

Sociology

- Woody Powell and others Networks
- Zucker/Darby Large scale data infrastructure

Psychology

- Schunn Analysis of team interactions
- Gero Situated cognition views of innovation

Visualization

- Thomas: Visual Analytics
- Borner: Mapping



Website: Features Researchers



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Porter, Alan

Bio

Professional Background

Alan L. Porter is professor emeritus of the School of Public Policy, and of Industrial & Systems Engineering (ISyE). His major concentration is technology forecasting and assessment. He received a B.S. in Chemical Engineering from Caltech (1967) and a PhD in Engineering Psychology from UCLA (1972). He served on the University of Washington faculty through 1974, joining Georgia Tech in 1975. He co-directs the Technology Policy and Assessment Center. He is also Director of R&D at Search Technology, Inc.

Research

Current research focuses on text mining of Science & Technology information resources (research publications, awards, citations, and patents) [see also www.theVantagePoint.com]. This informs Future-oriented Technology Analyses. Current NSF funding includes ongoing work on nanotechnology text data mining to help profile research areas and forecast emerging opportunities. A new NSF project is on "Measuring & Tracking Research Knowledge Integration."

SciSIP Awards

SciSIP Award # 0630207: TLS: Measuring and Tracking Research Knowledge Integration and Transfer; Alan Porter and Ismael Rafols.

Relevant Publications

- Porter, A.L., and Rafols, I., "Is Science Becoming more Interdisciplinary? Measuring and Mapping Six Research Fields over Time", *Scientometrics*, p. , vol. , (2009). Accepted.
- Porter, A.L., and Youtie, J., "How Interdisciplinary is Nanotechnology?", *Journal of Nanoparticle Research*, (2009). Accepted.
- Porter, A.L., and Youtie, J., "Where Does Nanotechnology Belong in the Map of Science?", *Nature-Nanotechnology*, (2009). Accepted.
- Rafols, I., and Leydesdorff, L., "Content-based and Algorithmic Classifications of Journals: Perspectives on the Dynamics of Scientific Communication and Indexer
- Porter, A.L., and Cunningham, S.W., *Tech Mining: A Primer on Exploiting Text Resources for Technology Managers and Professionals*, Wiley, New York, 2005.
- Porter, A.L., Kongthon, A., Lu, J.-C., "Research Profiling: Improving the Literature Review," *Scientometrics*, Vol. 53, p. 351-370, 2002.
- Porter, A.L., Cohen, A.S., Roessner, J.D., and Perreault, M. *Measuring Researcher Interdisciplinarity*, *Scientometrics*, Vol. 72, No. 1, 2007, p. 117-147.
- Porter, A.L., Youtie, J., Shapira, P., and Schoenick, D.J., "Refining Search Terms for Nanotechnology," *Journal of Nanoparticle Research*, 2007 [Online First: 10.1007/s11051-007-9296-y].
- Porter, A.L., and Porter, A.L. "Integrated Extraction and Visualization of Information for Technology Intelligence and

Porter, Alan

0 Posts
140 Points



Related Documents

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SciSIP Member



SciSIP Grantee

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No users have been added to Porter, Alan's friends list.

Favorites

Porter, Alan has not yet identified any favorite posts.

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Borner, Katy

Bio

Professional Background

Katy Börner is the Victor H. Yngve Professor of Information Science at the School of Library and Information Science, Adjunct Professor in the School of Informatics, Core Faculty of Cognitive Science, Research Affiliate of the Biocomplexity Institute, Fellow of the Center for Research on Learning and Technology, Member of the Advanced Visualization Laboratory, and Founding Director of the Cyberinfrastructure for Network Science Center (<http://cns.sils.indiana.edu>) at Indiana University. She is a curator of the Places & Spaces: Mapping Science exhibit (<http://scimaps.org>). She holds a MS in Electrical Engineering from the University of Technology in Leipzig, 1991 and a Ph.D. in Computer Science from the University of Kaiserslautern, 1997.

Research

Her research focuses on the development of data analysis and visualization techniques for information access, understanding, and management. She is particularly interested in the study of the structure and evolution of scientific disciplines; the analysis and visualization of online activity; and the development of cyberinfrastructures for large scale scientific collaboration and computation. She is the co-editor of the Springer book on "Visual Interfaces to Digital Libraries" and of a special issue of PNAS on "Mapping Knowledge Domains" (2004).

SciSIP Awards

SciSIP Award #0738111: TLS: Towards a Macroscopic for Science Policy Decision Making; Katy Borner, Kevin Boyack, and Weixia Huang.

Borner, Katy



0 Posts
420 Points

Related Documents

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Friends

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Website: Features Research Areas

Members, etc.

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Profile	Affiliation	Tags
Amaral, Luis SciSIP Member SciSIP Grantee	Northwestern Professor	systems, Decision making, complex systems, graph theory
Arora, Ashish SciSIP Member SciSIP Grantee	Duke University Professor of Economics and Public Policy	Patents, Intellectual Property, R&D, Innovation, Technology licensing, Know-how, Licensing, Market Structure, chemical industry, software industry, biotechnology, entrepreneurship
Arthur, William SciSIP Member SciSIP Grantee	Santa Fe Institute in New Mexico External Faculty Member	out of equilibrium dynamics, technology networks, descendant technologies, Technological Change, Invention, complex systems, Complex Networks, Technological Change/Innovation
Axtell, Robert SciSIP Member SciSIP Grantee	George Mason University Professor	multi-agent systems computer science, economics, Game Theory
Azoulay, Pierre SciSIP Member SciSIP Grantee	MIT Professor	Publication Harvester, Scientific Productivity, patent citations, knowledge stocks, future citation stock, publication output, knowledge spillover, Patenting, Star Scientists
Bailey, Diane SciSIP Member SciSIP Grantee	University of Texas - Austin School of Information Assistant Professor	Innovation, engineering
Baker, Erin SciSIP Member SciSIP Grantee	University of Massachusetts Professor	Energy Technology Policy, Decision Making Under Uncertainty, Technological Change, Climate Change
Barrington, Linda SciSIP Member SciSIP Grantee	The Conference Board Organizer	Innovation, infrastructure, change, organization

Grantees and members

- Award Descriptions
- Research Findings

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Keyword (in name, email, bio)
:team science"

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The goal of the Science of Science Policy community is to provide a scientifically rigorous and quantitative basis for science policy. The website provides a central location with news, information and research to help inform the Federal Government's science management decisions. We welcome the active engagement and participation of Federal practitioners, researchers, and others in the broader science community. [Click here to learn more about SoSP.](#)

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Next Steps: Interagency SOSP Linkages

- **Feedback from the 2008 SoSP Workshop: shaped interagency research priorities for SOSP:**
 - Developing a Data Infrastructure for Science and Innovation Policy; Modeling; Creating an Innovation Framework ; Informing and Assessing R&D Investments; Conducting Outreach to Underrepresented Populations
- **Feedback from 2009 SoSP Workshop: Best Practices in Research and Development Prioritization, Management, and Evaluation**
 - Building community of practice; Focus on link to research coming out of NSF SciSIP program
- **2010 SoSP Workshop: Metrics**
 - Economic Benefits (led by NSF); Social Benefits (led by NIH); Workforce Development (led by DOE); Technology Deployment (led by NIST). The topic of Diversity will be integrated into each of these modules (led by NOAA).



Next Steps: International

- International Emulation
 - Brazil?
 - Japan
 - UK
 - European Union
- Changing the Conduct of Science in the Information Age
 - EuroHORCS
- Center of Excellence in Middle East



Next Steps: STAR METRICS (OSTP/NIH/NSF)

- ★ STAR METRICS (Science and Technology for America's Reinvestment: Measuring the Effect of Research on Innovation, Competitiveness and Science), is the first national federal and university partnership to document the outcomes of science investments to the public.
- ★ Initially, we will develop a transparent way of calculating the initial impact of federal science spending on job creation.
- ★ Subsequently we will measure the impact of federal science investment on economic growth (through patents, firm start ups and other measures), on scientific knowledge (such as publications and citations) and, later, on social outcomes (such as health and environment)



More Information

- Email Julia Lane (jlane@nsf.gov)
- Go to website <http://scienceofsciencepolicy.net>
- Join listserv (scisip@lists.nsf.gov)
- Submit a proposal: Annual Deadline Sept 9.
- Note that next solicitation due date is Sept 9, 2010
- http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=501084&org=SEBE