Using Scientometrics to Accelerate Science

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Indiana CTSI Retreat at IUB  
Alumni hall, IMU, IUB.

October 10, 2011
VIVO: A Semantic Approach to Creating a National Network of Researchers (http://vivoweb.org)

- Semantic web application and ontology editor originally developed at Cornell U.
- Integrates research and scholarship info from systems of record across institution(s).
- Facilitates research discovery and cross-disciplinary collaboration.
- Simplify reporting tasks, e.g., generate biosketch, department report.

Funded by $12 million NIH award.

**Temporal Analysis (When)** Temporal visualizations of the number of papers/funding award at the institution, school, department, and people level
Topical Analysis (What) Science map overlays will show where a person, department, or university publishes most in the world of science. (in work)

Network Analysis (With Whom?) Who is co-authoring, co-investigating, co-inventing with whom? What teams are most productive in what projects?
Geospatial Analysis (Where) Where is what science performed by whom? Science is global and needs to be studied globally.

VIVO On-The-Go

Overview, Interactivity, Details on Demand come to commonly used devices and environments

Video and paper are at [http://www.scivee.tv/node/27704](http://www.scivee.tv/node/27704)
Type of Analysis vs. Level of Analysis

<table>
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<tr>
<th>Type of Analysis</th>
<th>Micro/Individual (1-100 records)</th>
<th>Meso/Local (101–10,000 records)</th>
<th>Macro/Global (10,000 &lt; records)</th>
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<td>Statistical Analysis/Profiling</td>
<td>Individual person and their expertise profiles</td>
<td>Larger labs, centers, universities, research domains, or states</td>
<td>All of NSF, all of science, all of SA, all of social science</td>
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<td>Funding portfolio of one individual</td>
<td>Mapping topic bursts of PNAS</td>
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<td>Mapping intellectual landscape of PNAS</td>
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<td>Knowledge flows in Chemistry research</td>
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<td>Network Analysis (With Whom?)</td>
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Evolving collaboration networks

Legend
- Node: Author (Name)
- Edge Width: Number of papers published
- Edge Color: Co-authorship duration
- Displayed Year: 1988

Mapping the Evolution of Co-Authorship Networks

Weiming Ke, Latitza Vazina, and Katy Borner
HUBIS Lab @ Indiana University
2004
Coauthor Network

Node Size
Number of Works Authored
- 1 circle

Node & Label Color
% Time First Author

Edge Width
Number of Times Coauthored
- 1

Edge Color
Date of Earliest Collaboration

Project Timeline

Area size equals award amount. Project title
Start date
End date

2003 2004 2005 2006 2007 2008
References


Debut of 5th Iteration of Mapping Science Exhibit at MEDIA X was on May 18, 2009 at Wallenberg Hall, Stanford University, [http://mediax.stanford.edu](http://mediax.stanford.edu), [http://scaleindependentthought.typepad.com/photos/scimaps](http://scaleindependentthought.typepad.com/photos/scimaps)

Science Maps in “Expedition Zukunft” science train visiting 62 cities in 7 months 12 coaches, 300 m long Opening was on April 23rd, 2009 by German Chancellor Merkel [http://www.expedition-zukunft.de](http://www.expedition-zukunft.de)
CTSI Accelerating Science Core

The core provides consulting, data mining, and visualization of information on the current practice of science to accelerate science and competitive research using a network science and science mapping approach.

Findings from theory-based research on the formation of productive teams, the identification of trends and emerging ideas, and the effective communication of complex results to diverse stakeholders are used to optimize science itself.

The Accelerating Science Core provides integrative analyses of relationships in support of institutes, programs, and projects, interested to accelerate the translation of scientific results to the improvement of human health.

Accelerating Science Core—Services Offered

**Evaluation & Monitoring:** Impact and/or strength analysis for a lab, center (e.g., NSF STCs or NIH CTSAs), institution, or region in order to evaluate, plan, or implement research efforts. Relevant data must be provided.

$2000-$6000*

**Data Compilation:** The construction of a custom data set (e.g., all papers, patents, grants for a certain institution or area of research) using the Scholarly Database (http://sdb.cns.iu.edu).

$3000*

**Visual Interface to Community Data:** Setting up an online interactive interface similar to http://mapsustain.cns.iu.edu (relevant data must be provided to the Core).

$6000*
Accelerating Science Core—Services Offered

**VIVO Researcher Networking:** Design and implementation of interactive custom VIVO visualizations (see [http://vivoweb.org](http://vivoweb.org) for more info on VIVO and [http://vivo.iu.edu/vis/map-of-science/BL-ARSC](http://vivo.iu.edu/vis/map-of-science/BL-ARSC) for a map of science visualization).

*$5000*  

**Training and Consulting in Data Mining and Visualization:**
Introduction of advanced data mining and visualization tools: 2-hour tutorials or 4-hour tutorials that also feature exemplary analyses of client data. See [http://sci2.cns.iu.edu/user/documentation.php](http://sci2.cns.iu.edu/user/documentation.php) for sample slides.

*$2000-*$5000*  

*Prices vary according to scope of work. Please contact us to request an estimate.*

All papers, maps, tools, talks, press are linked from [http://cns.iu.edu](http://cns.iu.edu)

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Mapping Science Exhibit Facebook: [http://www.facebook.com/mappingscience](http://www.facebook.com/mappingscience)