



# VIVO

connect • share • discover

## VIVO Visualizations: Design and Usage

August 22, 2012

8:30 am – 12:00 pm

**Facilitators:** Chin Hua Kong and Katy Börner (Cyberinfrastructure for Network Science Center, SLIS, Indiana University)

**VIVO Team:** **Cornell University:** Dean Krafft (Cornell PI), Manolo Bevia, Jim Blake, Nick Cappadona, Brian Caruso, Jon Corson-Rikert, Elly Cramer, Medha Devare, John Ferreira, Brian Lowe, Stella Mitchell, Holly Mistlebauer, Anup Sawant, Christopher Westling, Rebecca Younes. **University of Florida:** Mike Conlon (VIVO and UF PI), Cecilia Botero, Kerry Britt, Erin Brooks, Amy Buhler, Ellie Bushhousen, Chris Case, Valrie Davis, Nita Ferree, Chris Haines, Rae Jesano, Margeaux Johnson, Sara Kreinest, Yang Li, Paula Markes, Sara Russell Gonzalez, Alexander Rockwell, Nancy Schaefer, Michele R. Tennant, George Hack, Chris Barnes, Narayan Raum, Brenda Stevens, Alicia Turner, Stephen Williams. **Indiana University:** Katy Borner (IU PI), William Barnett, Shanshan Chen, Ying Ding, Russell Duhon, Jon Dunn, Micah Linnemeier, Nianli Ma, Robert McDonald, Barbara Ann O'Leary, Mark Price, Yuyin Sun, Alan Walsh, Brian Wheeler, Angela Zoss. **Ponce School of Medicine:** Richard Noel (Ponce PI), Ricardo Espada, Damaris Torres. **The Scripps Research Institute:** Gerald Joyce (Scripps PI), Greg Dunlap, Catherine Dunn, Brant Kelley, Paula King, Angela Murrell, Barbara Noble, Cary Thomas, Michaeleen Trimarchi. **Washington University, St. Louis:** Rakesh Nagarajan (WUSTL PI), Kristi L. Holmes, Sunita B. Koul, Leslie D. McIntosh. **Weill Cornell Medical College:** Curtis Cole (Weill PI), Paul Albert, Victor Brodsky, Adam Cheriff, Oscar Cruz, Dan Dickinson, Chris Huang, Itay Klaz, Peter Michelini, Grace Migliorisi, John Ruffing, Jason Specland, Tru Tran, Jesse Turner, Vinay Varughese.



### Sci<sup>2</sup> Tool: Download and Run also distributed on Memory Stick

- These slides  
<http://ivl.slis.indiana.edu/km/pres/2012-kong-borner-vivo-tutorial.pdf>
- Sci2 Tool Manual v0.5.1 Alpha, updated to match v1.0 Alpha tool release  
<http://sci2.wiki.cns.iu.edu>
- Sci2 Tool v1.0 Alpha (June 13, 2012)  
<http://sci2.cns.iu.edu>
- Additional Datasets  
<http://sci2.wiki.cns.iu.edu/2.5+Sample+Datasets>
- Additional Plugins  
<http://sci2.wiki.cns.iu.edu/3.2+Additional+Plugins>



Or copy them from the DVD or memory stick.

Postscript Viewer: Please try opening 'chessboard.ps.' You should see



### **Content and Instructional Approach**

VIVO is an excellent system for creating and managing faculty and researcher profiles, but it is also capable of much more. VIVO's ability to obtain and interlink data from a variety of high quality sources, including institutional systems of record and online databases, coupled with VIVO's use of open semantic web technologies, makes VIVO an exciting and powerful data platform. This platform makes VIVO itself capable of many new features, and also makes it possible for outside companies and researchers to develop their own VIVO applications and perform their own analyses using VIVO data.

This hands-on workshop aims to explore the possibilities of VIVO technology and data by way of the Cyberinfrastructure for Network Science Center's VIVO visualization work. It starts with an overview of VIVO's architecture, and explores how the architecture makes it possible to expand and build on VIVO. We then describe the Cyberinfrastructure for Network Science Center's visualization work, including an overview of the visualizations created for VIVO thus far. Taking a closer look at the VIVO visualizations, we explore their individual motivations and features, and how we use VIVO to make these visualizations possible. This is followed by a hands-on component where participants are guided through the creation of a simple visualization using live data from VIVO instance as well as workflows that use the Science of Science (Sci2) Tool (<http://sci2.cns.iu.edu>) and Gephi (<http://gephi.org>) to perform detailed analyses of VIVO data. The workshop concludes with a general question-answer session.

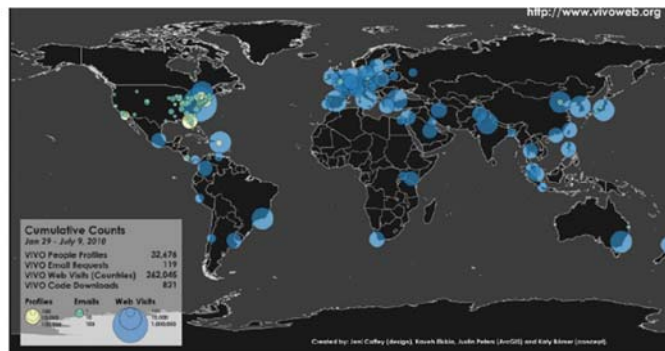
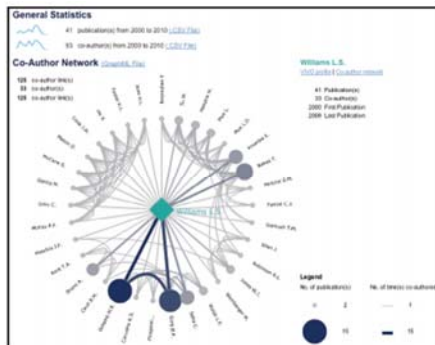
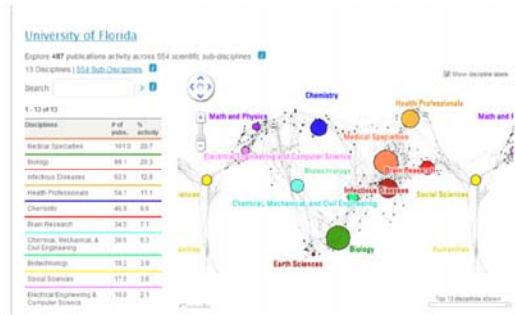
3

### **Target Audience and Learning Objectives**

- Anyone interested in the visualization capabilities of VIVO, and the visualization work of the Cyberinfrastructure for Network Science Center.
- Software developers interested in an overview of the VIVO environment from a technical perspective, and a more in-depth exploration of VIVO through the lens of visualization development.
- Librarians and Science Administrators interested in gaining a deeper understanding of how VIVO works, exploring some of what it is already capable of, and understanding what it could be used for in the future.
- Companies that plan to offer value-added services for VIVO.
- Researchers that would like to utilize VIVO data in their scientific work.

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- **Individual level.** Statistics and ego-centric scholarly networks on VIVO Profile pages.
- **Institutional level.** Analyses and visualizations of funding intake and publication output for departments and centers accessible via the VIVO Index page. Download of relevant data in tabular and network formats for further analysis using the Network Workbench tool.
- **National level.** Visualization of VIVO installations and their profile holdings together with web page access and general VIVO information requests. Plus, services that use VIVO URIs to access data across different VIVO instances.



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## Workshop Attendees

Registered by Aug. 13, 2012



Participant_First_Name	Participant_Last_Name	Participant_Title	Participant_Organization	Participant_Email
Radha	Allam	Managing Director	NETE	nasim@nete.com
Melissa	Benton	Program Analyst	EPA	benton.melissa@epa.gov
Terry	Bishop	Hematology Program Director	National Institute of Health	bishopt@extra.niddk.nih.gov
Richard	Bookman	Sr. Adv for Pgm Dev & Sci Policy	UM	rbookman@miami.edu
Will	Collante	Data Architect	University of Florida	wjc813@ufl.edu
Hillary	Corbett	Scholarly Communication Librarian	Northeastern University	h.corbett@neu.edu
Bryan	Dennis	Consultant	American Psychological Association	bjdennis@gmail.com
Holly	Falk-Krzesinski	Director	Northwestern University	h-falk@northwestern.edu
Alexander	Garcia-Castro	Assistant in Research	Florida State University	alexgarcia@gmail.com
Laura	Guazzelli	Web Developer	University of Florida	laura2@ufl.edu
Jeffrey	Horon	Consultant	Elsevier, Inc.	j.horon@elsevier.com
Nicholas	Rejack	Ontologist & Data Steward	University of Florida	nrejack@ufl.edu
Arve	Sollard	Senior Programmer/Web Design	Griffith University	a.sollard@griffith.edu.au
Bradley	Taylor	Manager, Bioinformatics	Medical College of Wisconsin	btaylor@mcw.edu
Michaelleen	Trimarchi	Senior Reference Librarian	The Scripps Research Institute	mtrimarc@scripps.edu

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# Workshop Schedule

## Hands-On (Katy Börner)

- Analysis & Visualization of VIVO Data using the Science of Science Tool (<http://sci2.cns.iu.edu>)

15 min break

## Guided Tour (Chin Hua Kong)

- Customizing existing VIVO visualization

## Guided Tour (Katy Börner)

- Analysis & Visualization of VIVO Data by others

## Q&A

7

### VIVO: A Semantic Approach to Scholarly Networking and Discovery

Katy Börner<sup>1</sup>, Michael Conlon<sup>2</sup>, Jon Corson-Rikert<sup>1</sup>, and Ying Ding<sup>1</sup>  
Indiana University<sup>1</sup>, University of Florida<sup>2</sup>, and Cornell University<sup>3</sup>

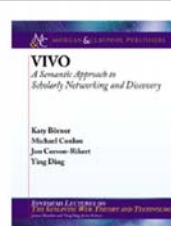
Series: *Synthesis Lectures on the Semantic Web: Theory and Technology*  
Series Editors: James Hendler, Rensselaer Polytechnic Institute  
Ying Ding, Indiana University

The world of scholarship is changing rapidly. Increasing demands on scholars, the growing size and complexity of questions and problems to be addressed, and advances in sophistication of data collection, analysis, and presentation require new approaches to scholarship. A ubiquitous, open information infrastructure for scholarship, consisting of linked open data, open-source software tools, and a community committed to sustainability are emerging to meet the needs of scholars today.

This book provides an introduction to VIVO, <http://vivoweb.org/>, a tool for representing information about research and researchers—their scholarly works, research interests, and organizational relationships. VIVO provides an expressive ontology, tools for managing the ontology, and a platform for using the ontology to create and manage linked open data for scholarship and discovery. Begun as a project at Cornell and further developed by an NIH funded consortium, VIVO is now being established as an open-source project with community participation from around the world. By the end of 2012, over twenty countries and fifty organizations will provide information in VIVO format on more than one million researchers and research staff, including publications, research resources, events, funding, courses taught, and other scholarly activity.

The rapid growth of VIVO and of VIVO-compatible data sources speaks to the fundamental need to transform scholarship for the twenty-first century.

<http://www.morganclaypool.com/toc/wbe.1/1/1>



ISBN  
Paperback  
9781608459933  
eBook  
9781608459940

Publication Date  
July 12, 2012

List Price  
\$45.00 / £27.50

Pages  
250



Please also consult Chapter 7  
in the VIVO Book.

## CHAPTER 7

105

# Analyzing and Visualizing VIVO Data

Chintan Tank, *Indiana University and General Sentiment*  
Micah Linnemeier, *Indiana University and University of Michigan*  
Chin Hua Kong and Katy Börner, *Indiana University*

## Workshop Schedule

### Hands-On (Katy Borner)

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### Guided Tour (Katy Borner)

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Q&A

9

## Type of Analysis vs. Level of Analysis

	<i>Micro/Individual (1-100 records)</i>	<i>Meso/Local (101-10,000 records)</i>	<i>Macro/Global (10,000 &lt; records)</i>
<i>Statistical Analysis/Profiling</i>	Individual person and their expertise profiles	Larger labs, centers, universities, research domains, or states	All of NSF, all of USA, all of science.
<i>Temporal Analysis (When)</i>	Funding portfolio of one individual	Mapping topic bursts in 20-years of PNAS	113 Years of physics Research
<i>Geospatial Analysis (Where)</i>	Career trajectory of one individual	Mapping a state's intellectual landscape	PNAS publications
<i>Topical Analysis (What)</i>	Base knowledge from which one grant draws.	Knowledge flows in Chemistry research	VxOrd/Topic maps of NIH funding
<i>Network Analysis (With Whom?)</i>	NSF Co-PI network of one individual	Co-author network	NSF's core competency

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**VIVO** Enabling a National Network of Scientists

Home People Organizations Research Events

**Davis, Vairie I | AST UNV LIBRA**

**Positions**

- Michigan Science Library Outreach Librarian for Agricultural Sciences** (2002 - 2005)
- Michigan Science Library Staff Maintenance Supervisor** (2001 - 2002)
- AST UNV LIBRARIAN**

**13 publications within the last 10 years (11 leads)**

**17 identifiers**

**1512772289**

**Primary Web Page**

**Michigan Science Library profile**

**14,200**

**Affiliations**

**Michigan Science Library**

**Outreach Librarian for Agricultural Sciences**

**VIVO** Enabling a National Network of Scientists

Home People Organizations Research Events

**University of Florida**

How do you want to compare?

by Publications

Who do you want to compare?

Search: [ ] X

Records 1 - 10 of 13

Entity Name	Publications	Entity Type
<input checked="" type="checkbox"/> Interdisciplinary Center for Bioremediation	18	UF Center, Agent, Center
<input checked="" type="checkbox"/> Continuing Education	24	UF Department, Agent, Non-Academic Department, Department
<input checked="" type="checkbox"/> Levin College of Law	17	Agent, UF College, College
<input checked="" type="checkbox"/> College of Agricultural and Life Sciences	14	Agent, UF College, College
<input type="checkbox"/> Whittier College of Agriculture and Horticulture	14	Agent, UF College, College
<input type="checkbox"/> Evelyn F. and William L. McKnight Brain Institute of the University of Florida	8	UF Center, Agent, Center

**Comparing Publications of Organizations in University of Florida**

**Total Number of Publications**

You have selected 4 of a maximum 10 organizations to compare. **Clear**

- College of Agricultural and Life Sciences: 14
- Levin College of Law: 17
- Continuing Education: 24
- Interdisciplinary Center: 18

**VIVO** Enabling a National Network of Scientists

Home People Organizations Research Events

**Search results for 'geriatrics'**

Show only results of this type: **people activities organizations research**

**AMERICAN GERIATRICS SOCIETY**

- Geriatrics Education Curriculum, Residents (Geri) Program
- Evidence Based Decision Making in Geriatric Geriatrics Disability

**AMERICAN GERIATRICS SOCIETY**

- Harford Geriatrics Leadership Scholar
- Geriatric and Aging Research Institute on Aging (GRI)
- AGS ON GERIATRICS ACADEMIC PROGRAMS
- US OLDTI RESOURCES AND SERVICES ADMIN
- Suifortn Study
- 2003 Scholar, Harford Institute of Geriatric Nursing Research, John A. Harford Institute for Geriatric Nursing, New York University
- Gene, Polysomnography and Prevention of Obstructive
- Insulinemia in the Sea Surface Echin
- Cardiac Mitral Regurgitation, Sleep and Microvascular
- AMES ACAD OF NURSING
- The Epidemiology of Stress and the Menopausal Syndrome
- Statement by a Sea Surface Echin

**VIVO** Enabling a National Network of Scientists

Home People Organizations Research Events

Welcome to VIVO

VIVO is a research-focused discovery tool that enables collaboration among scientists across all disciplines.

Browse or search information on people, departments, courses, grants, and publications.

Search VIVO

Log in

Search

Log in

Browse by

- Grants (11,814)
- People (48,721)
- Activities (11,818)
- Courses (1116)
- Events (379)
- Organizations (20,338)
- Research (11,283)
- Locations (376)

- Faculty Member (8882)
- Graduate Student (1)
- Librarian (67)
- Non-Faculty (7586)
- Non-Faculty Academic (2)
- Alumn (8972)
- Professor Emeritus (802)

**UF** Clinical and Translational Science Institute  
UNIVERSITY of FLORIDA

**University of Florida**

How do you want to compare?

by Grants

Who do you want to compare?

Search: [ ] X

Records 1 - 10 of 30

Entity Label	Grant Count	Entity Type
<input checked="" type="checkbox"/> Continuing Education	562	UF Department, Agent, Non-Academic Department, Department
<input checked="" type="checkbox"/> Florida Museum of Natural History	203	Museum, Agent
<input checked="" type="checkbox"/> College of Agricultural and Life Sciences	166	Agent, UF College, College
<input checked="" type="checkbox"/> College of Engineering	103	Agent, UF College, College
<input checked="" type="checkbox"/> Evelyn F. and William L. McKnight Brain Institute of the University of Florida	64	UF Center, Agent, Center
<input checked="" type="checkbox"/> International Center	54	UF Department, Agent, Non-Academic Department, Department
<input checked="" type="checkbox"/> Florida Sea Grant	44	UF Center, Agent, Center
<input type="checkbox"/> Whitney Laboratory for Marine Bioscience	42	UF Research Laboratory, Agent, Laboratory, Research Laboratory
<input type="checkbox"/> Water Institute	38	UF Center, Agent, Center
<input type="checkbox"/> College of Dentistry	35	Agent, UF College, College

**Comparing Grants of Organizations in University of Florida**

**Total Number of Grants**

You have selected 7 of a maximum 10 organizations to compare. **Clear**

- Florida Sea Grant: 44
- International Center: 54
- Evelyn F. and William L. McKnight Brain Institute of the University of Florida: 64
- College of Engineering: 103
- College of Agricultural and Life Sciences: 166
- Florida Museum of Natural History: 203
- Continuing Education: 562

**Save as CSV** **Clear**

**Temporal Analysis (When)** Temporal visualizations of the number of papers/funding awarded at the institution, school, department, and people level



<http://nrn.cns.iu.edu>

**Geospatial Analysis (Where?)** Where are what NRN instances and what data holdings do they have?

13

Hide Map ▲ Data Register About

### Register

Welcome to the NRN group. Take this one step approach to increase the visibility of your institution, further expose your researcher network to the world.

**System type:**

- Elsevier SciVal Experts
- Harvard Catalyst Profiles
- Stanford CAP
- VIVO
- Other  System home page URL:

**Institution name:**  **Institution home page URL:**

**Available Resources:**

- People URL:
- Publications URL:
- Patents URL:
- Funding URL:
- Courses URL:

**Contact email:**

You will need to register for each new institution instance.

<http://nrn.cns.iu.edu>

**Geospatial Analysis (Where?)** Where are what NRN instances and what data holdings do they have?

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VIVO | connect - share - discover

vivoweb.org

Most Visited Latest Headlines BC Wiki Jira Slashtmp Home Math Sci<sup>2</sup> SP IG Google Atlas

VIVO connect + share + discover

Home About Download Support Contact

Search

## An interdisciplinary network

Enabling collaboration and discovery among scientists across all disciplines.

Find out how your institution can participate

The network of scientists will facilitate scholarly discovery. Institutions will participate in the network by installing VIVO, or by providing semantic web-compliant data to the network.

Cornell Un people: 67 publication

International Researcher Network

2012 VIVO Conference  
August 22-24  
Hotel InterContinental Miami

International Researcher Network | VIVO

vivoweb.org/international-researcher-network

Most Visited Latest Headlines BC Wiki Jira Slashtmp Home Math Sci<sup>2</sup> SP IG Google Atlas

VIVO connect + share + discover

Home About Download Support Contact

Search

home » international researcher network

## International Researcher Network

Participate

FAQ

Open Source Community

Subscribe to the VIVO Newsletter

VIVO Store

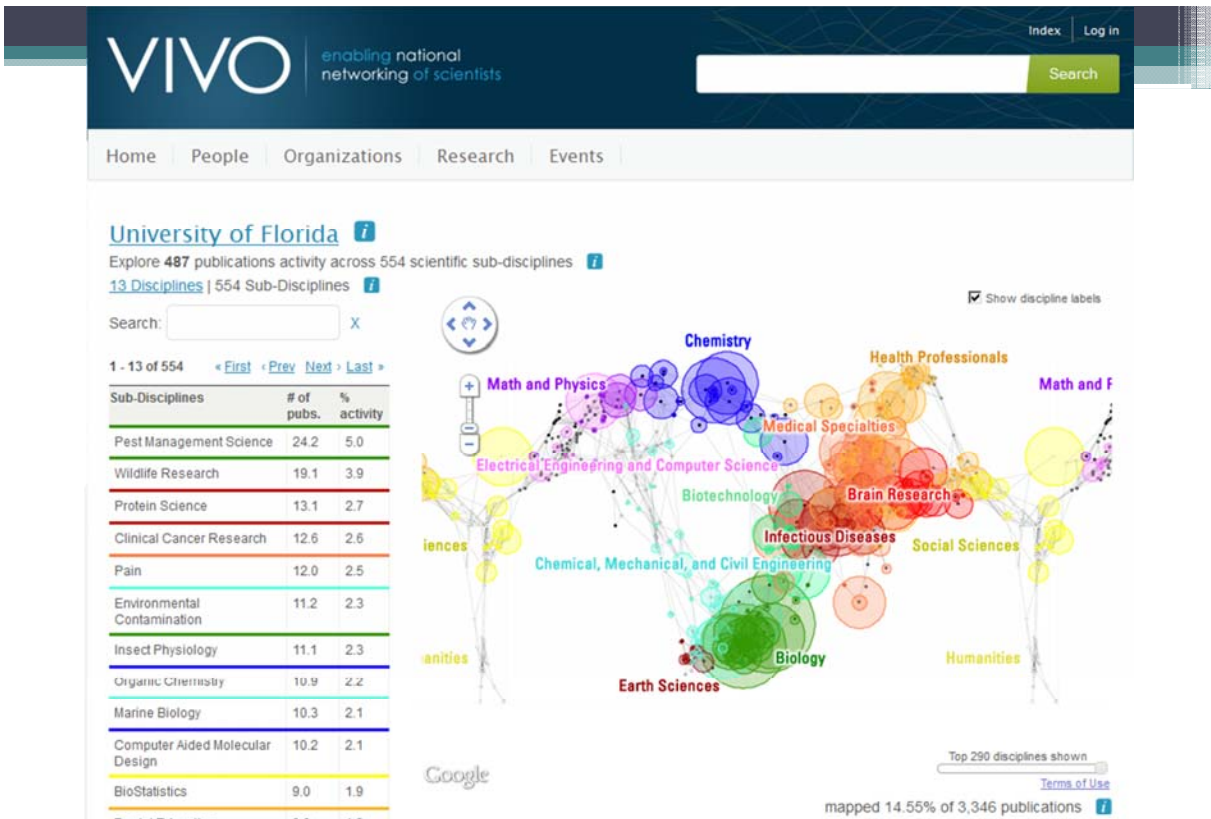
Register your instance at [NRN.CNS.IU.EDU](http://NRN.CNS.IU.EDU)

Terms of Use

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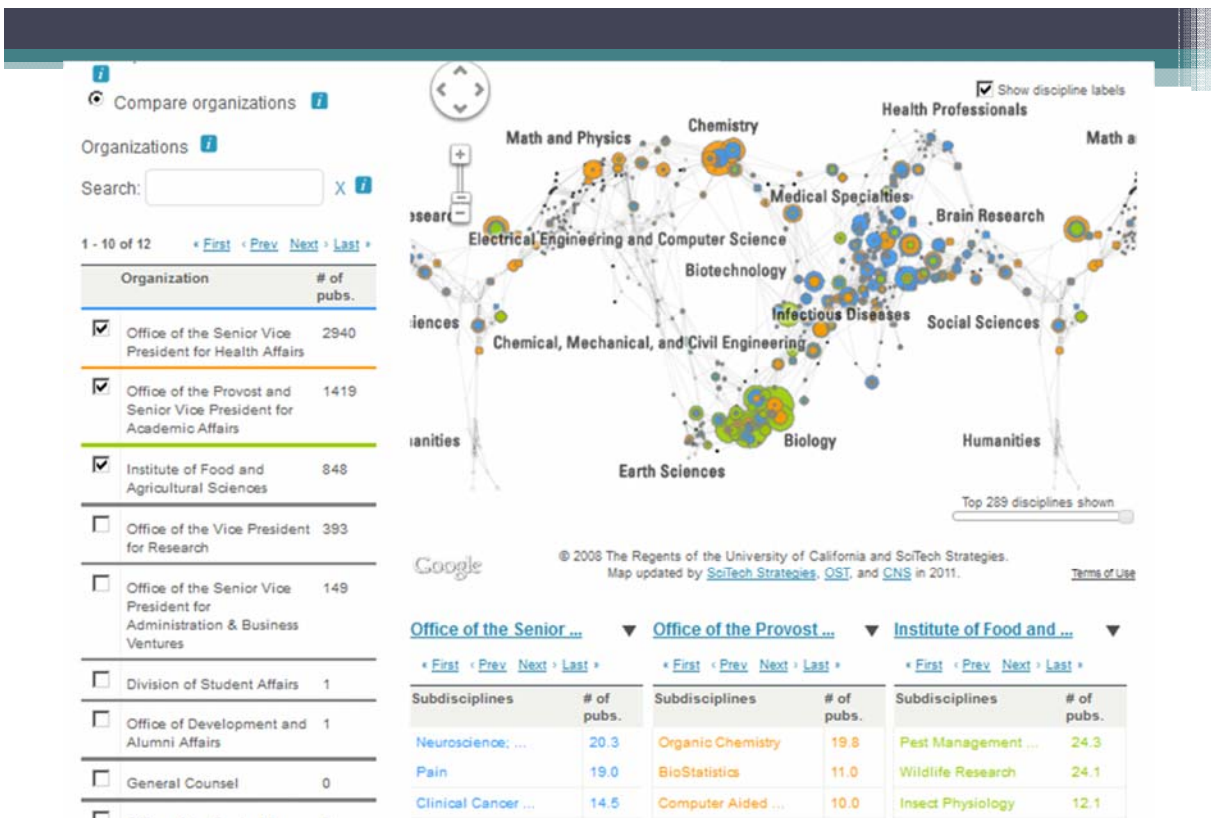
Login | Contact Us | Site Map





**Topical Analysis (What)** Science map overlays will show where a person, department, or university publishes most in the world of science. (in work)

17



**Topical Analysis (What)** Science map overlays will show where a person, department, or university publishes most in the world of science. (in work)

18

**Conlon, Mike**  
Associate Director and Chief Operating Officer

Co-Author Network [\(GraphML File\)](#)

**Profile**

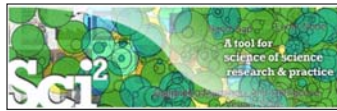
Conlon, Mike  
Associate Director and Chief O...  
[VIVO profile](#) | [Co-author network](#)

- 5 Publication(s)
- 12 Co-author(s)
- 1991 First Publication
- 2004 Last Publication

Note: This information is based solely on publications which have been loaded into the VIVO system. This may only be a small sample of the person's total work.

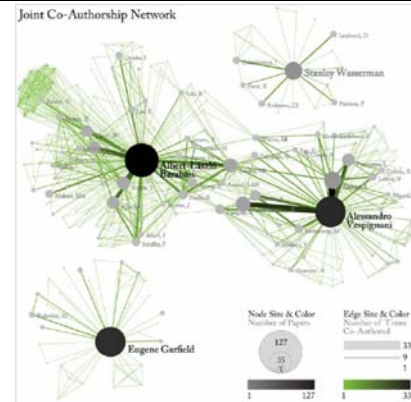
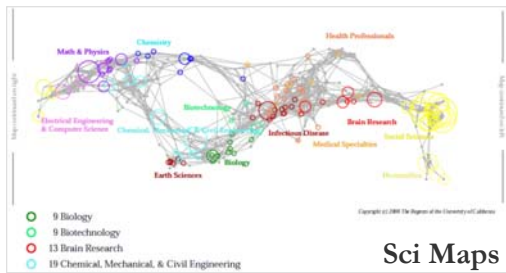
**VIVO**  
Enabling a National Network of Scientists

**Network Analysis (With Whom?)** Who is co-authoring, co-investigating, co-inventing with whom? What teams are most productive in what projects? 19

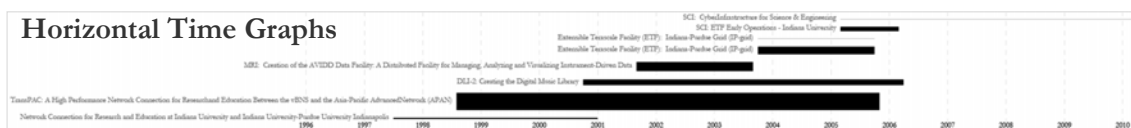


### Sci<sup>2</sup> Tool – “Open Code for S&T Assessment” to run replicable workflows

OSGi/CShell powered tool, see <http://cishell.org>  
<http://sci2.cns.iu.edu> | <http://sci2.wiki.cns.iu.edu>



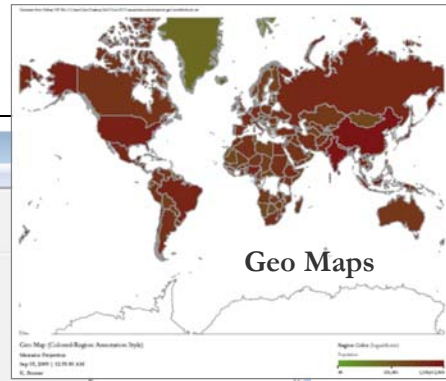
### Horizontal Time Graphs



Börner, Katy, Huang, Weixia (Bonnie), Linnemeier, Micah, Dubon, Russell Jackson, Phillips, Patrick, Ma, Nianli, Zoss, Angela, Guo, Hanning & Price, Mark. (2009). *Rete-Netzwerk-Red: Analyzing and Visualizing Scholarly Networks Using the Scholarly Database and the Network Workbench Tool. Proceedings of ISSI 2009: 12th International Conference on Scientometrics and Informetrics, Rio de Janeiro, Brazil, July 14-17. Vol. 2, pp. 619-630.*



## Sci² Tool



Sci² Tool

File Preprocessing Modeling Analysis Visualization Scientometrics Help

Console

Welcome to the Science of Science Tool (Sci²). The development of this tool is supported in Network Science center and the School of Informatics at Indiana University, the National Science Foundation (NSF) grant IRI-0715303, and the James S. McDonnell Cyberinfrastructure portal (<http://sci.slis.indiana.edu>).

The primary investigators are Katy Börner, Ingrid Isenhardt, and SciTech Strategies Inc. The Sci² tool was developed by J. Duhon, Patrick A. Phillips, Chintan Tank, a Cyberinfrastructure Shell (<http://cishell.org>) for Network Science Center (<http://cns.slis.indiana.edu>). Many algorithm plugins were derived from the Network Science Center (<http://nwb.slis.indiana.edu>).

Please cite as follows:  
Sci² Team. (2009). Science of Science Tool. In Proceedings of the 2009 International Conference on Weblogs and Social Media (ICWSM'09). New York, NY: ACM Press.

Scheduler

Remove From List  Remove completed

!	Algorithm Name	Date	Time	% Complete
<input checked="" type="checkbox"/>	Extract Co-Author Network	09/03/2009	00:15:20 AM	100%
<input checked="" type="checkbox"/>	Load and Clean ISI File	09/03/2009	00:15:05 AM	100%

Circular Hierarchy

21



## Sci² Tool: Documentation

### Forgot your password?

To recover your account

Not registered yet?

[Register now](#)

### Tutorials

Scott Weingart, Hannang Biberstine (2010) *Science of Science*, Indiana University

Katy Börner (2010) *Science of Science Research and Tools (12 Tutorials)*. Reporting Branch, Office of Extramural Research/Office of the Director, National Institutes of Health, Bethesda, MD.

- Tutorial #01: [Science of Science Research](#)
- Tutorial #02: [Network Science / Information Visualization](#)
- Tutorial #03: [CIShell Powered Tools: Network Workbench and Science of Science Tool](#)
- Tutorial #04: [Temporal Analysis—Burst Detection](#)
- Tutorial #05: [Geospatial Analysis and Mapping](#)
- Tutorial #06: [Topical Analysis & Mapping](#)
- Tutorial #07: [Tree Analysis and Visualization](#)
- Tutorial #08: [Network Analysis and Visualization](#)
- Tutorial #09: [Large Network Analysis and Visualization](#)
- Tutorial #10: [Using the Scholarly Database at IU](#)
- Tutorial #11: [VIVO National Researcher Networking](#)
- Tutorial #12: [Future Developments](#)

Geetha Senthil (2010). [Multidisciplinary Nature of Work With Reference to PIs and ICs Within a Portfolio](#). PA Group at NIH.

NIH Office of Extramural Research and Katy Börner (2010) [Network Visualizations Using SPIRES Data and the Sci² Tool](#). Office of Extramural Research at NIH.



## Sci<sup>2</sup> Tool: Download and Run also distributed on Memory Stick

- These slides  
<http://ivl.slis.indiana.edu/km/pres/2012-kong-borner-vivo-tutorial.pdf>
- Sci2 Tool Manual v0.5.1 Alpha, updated to match v1.0 Alpha tool release  
<http://sci2.wiki.cns.iu.edu>
- Sci2 Tool v1.0 Alpha (June 13, 2012)  
<http://sci2.cns.iu.edu>
- Additional Datasets  
<http://sci2.wiki.cns.iu.edu/2.5+Sample+Datasets>
- Additional Plugins  
<http://sci2.wiki.cns.iu.edu/3.2+Additional+Plugins>

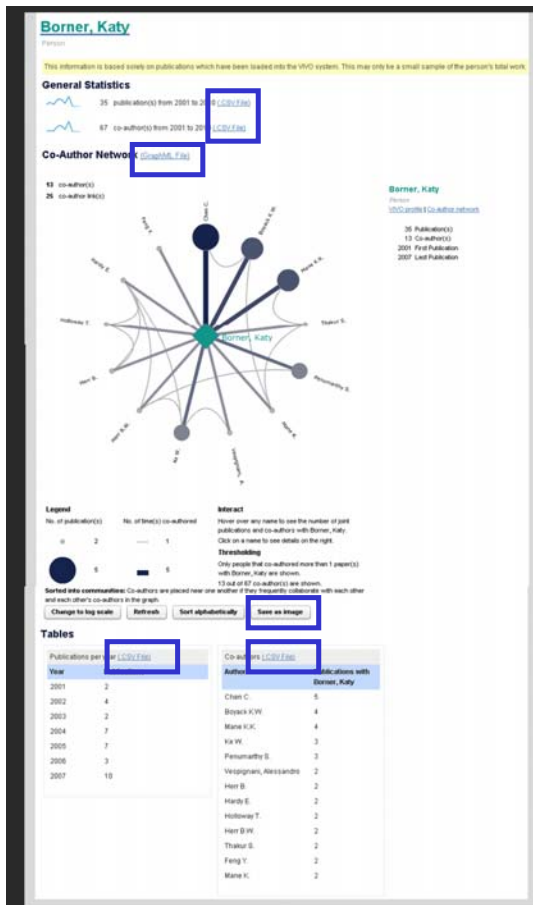


Or copy them from the DVD or memory stick.

Postscript Viewer/Converter: Please try opening 'chessboard.ps.'  
You should see the chessboard.  
Adobe Distiller or <http://ps2pdf.com> work well.



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## Using Data from VIVO

### General Statistics

- 36 publication(s) from 2001 to 2010 [\(.CSV File\)](#)
- 80 co-author(s) from 2001 to 2010 [\(.CSV File\)](#)

### Co-Author Network

[\(GraphML File\)](#)

Save as Image (.PNG file)

### Tables

- Publications per year [\(.CSV File\)](#)
- Co-authors [\(.CSV File\)](#)

<http://vivo.iu.edu/vis/author-network/person25557>

24

36 publication(s) from 2001 to 2010 ([.CSV File](#))

Year	Publications
2001	2
2002	4
2003	2
2004	7
2005	7
2006	3
2007	10
2010	1

80 co-author(s) from 2001 to 2010 ([.CSV File](#))

Year	Count	Co-Author(s)
2001	1	Chen C.
2002	3	Chen C.; McMahon T.; Feng Y.
2003	2	Chen C.; Boyack K.W.
2004	17	Sengupta A.; Penumarthy S.; Thakur S.; Sooriamurthi R.; Maru J.T.; Shiffrin R.M.; Mane K.; Moor K.A.;

Co-author network ([GraphML File](#))

```

1 <?xml version="1.0" encoding="UTF-8"?>
2 <graphml xmlns="http://graphml.graphdrawing.org/xmlns"
3 xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
4 xsi:schemaLocation="http://graphml.graphdrawing.org/xmlns
5 http://graphml.graphdrawing.org/xmlns/1.0/graphml.xsd">
6 <key id="label" for="node" attr.name="label" attr.type="string" />
7 <key id="number_of_authored_works" for="node" attr.name="number_of_authored_works" attr.type="int" />
8 <key id="num_unknown_publication" for="node" attr.name="num_unknown_publication" attr.type="int" />
9 <key id="num_latest_publication" for="node" attr.name="num_latest_publication" attr.type="int" />
10 <key id="latest_publication" for="node" attr.name="latest_publication" attr.type="int" />
11 <key id="profile_url" for="node" attr.name="profile_url" attr.type="string" />

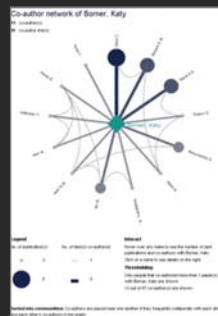
```

Save as Image (.PNG file)

Publications per year ([.CSV File](#)), see top file.

Co-authors ([.CSV File](#))

Co-Author	Count
Andrienko G.	1
Andrienko N.	1
Ben-Miled Z.	1
Blackwell A.	1
Boyack K.W.	4
Bozicevic M.	1
Brodbeck D.	1
Burkhard R.A.	1
Chen C.	5



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**VIVO** research and expertise across Indiana University Search

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**Ding, Ying** Co-Investigator Network

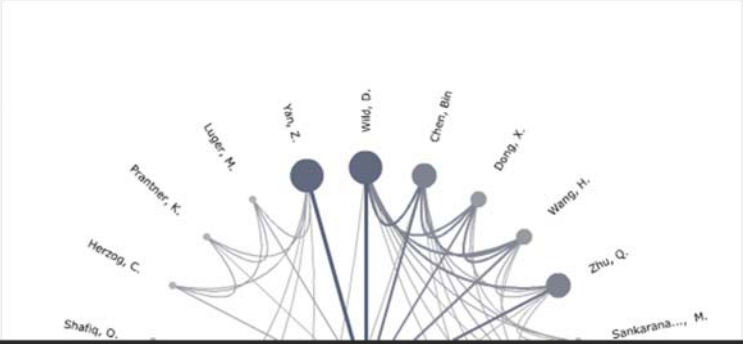
Co-Author Network ([GraphML File](#))

**Profile**



**Ding, Ying**  
[VIVO profile](#)

29 Publication(s)  
23 Co-author(s)  
2007 First Publication




<http://vivo.iu.edu/vis/author-network/person751182>

VIVO enabling national networking of scientists

Index | Log in


Search

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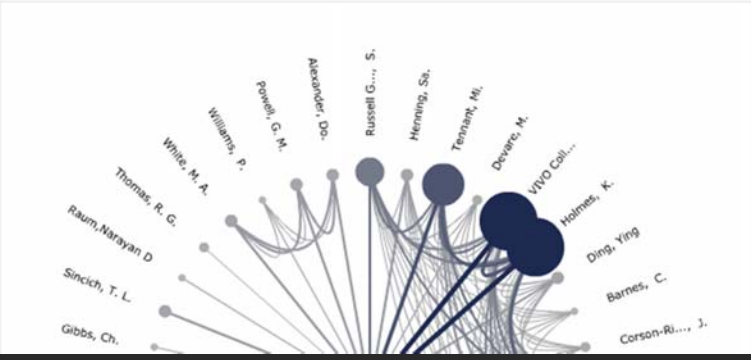
Conlon, Michael  [Co-Investigator Network](#)

Co-Author Network [\(GraphML File\)](#)

**Profile**



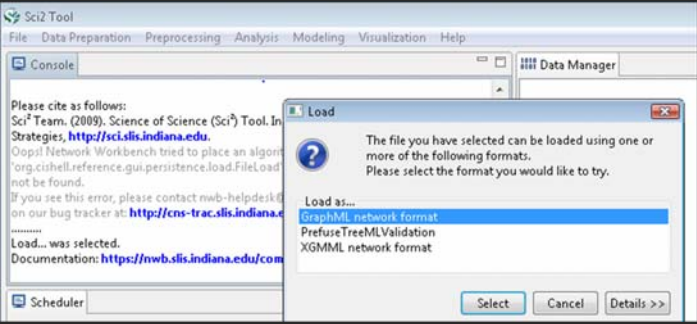
Conlon, Michael  
[VIVO profile](#)  
 148 Publication(s)  
 37 Co-author(s)  
 1977 First Publication



<https://vivo.ufl.edu/vis/author-network/n25562>

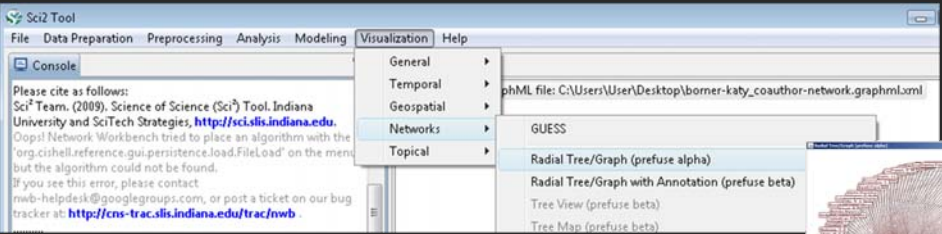
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Run Sci2 Tool. Use 'File > Load' to select 'conlon-michael\_co-author-network.graphml'




Network Analysis Toolkit  
 Nodes: 177  
 Edges: 771

Visualize the file using *Visualization > Networks > Radial Tree/Graph (prefuse alpha)*

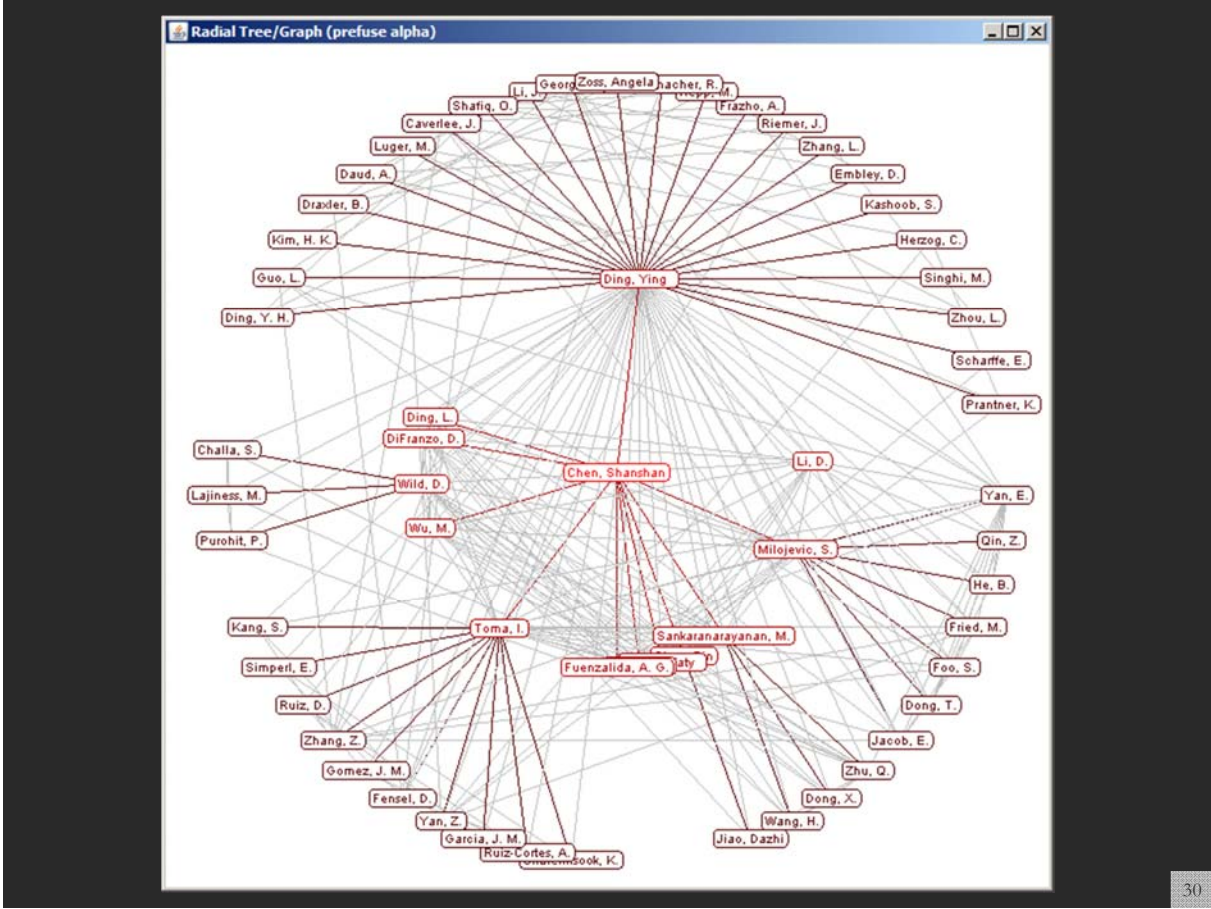
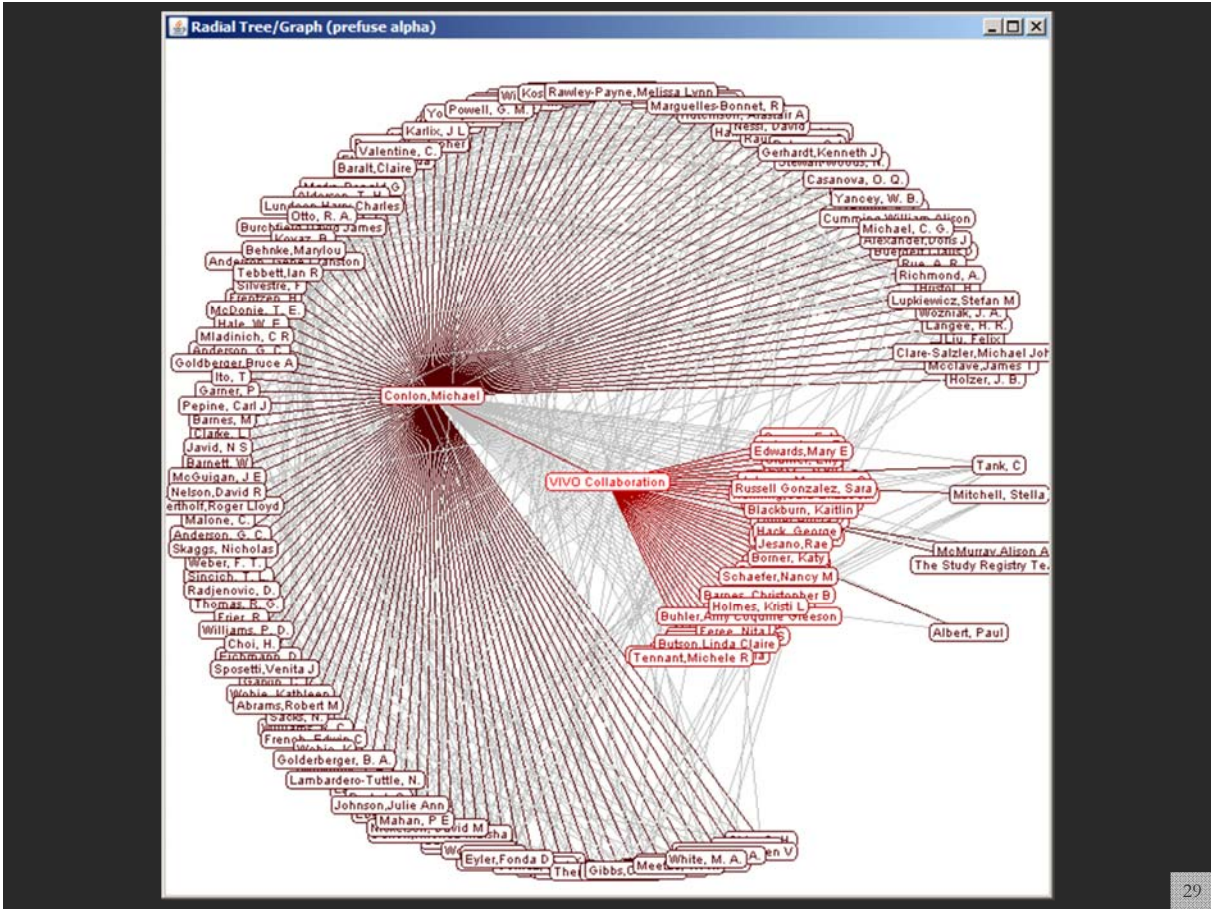


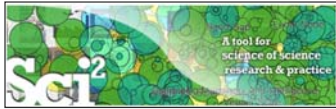
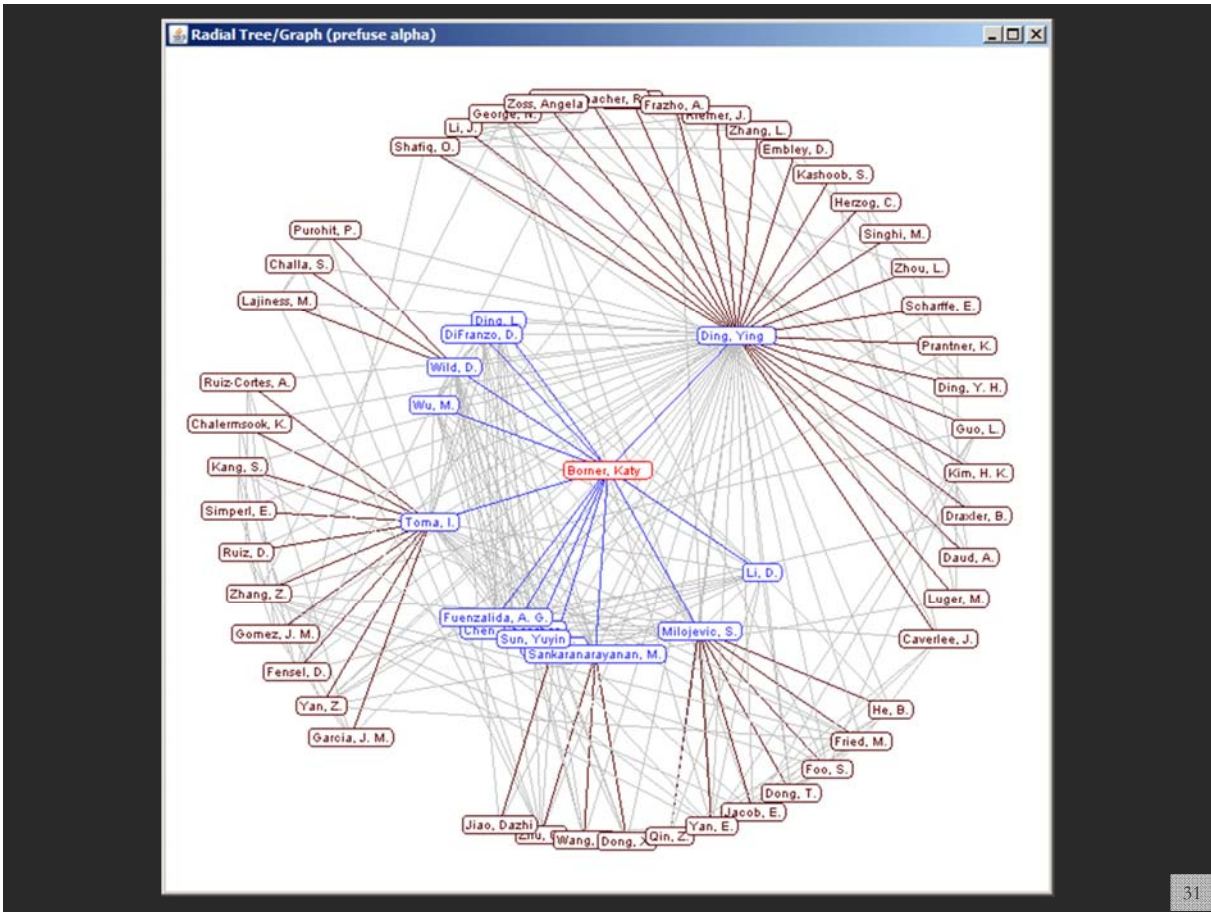
Click on node to focus on it.  
 Hover over a node to highlight its co-authors.

Code and tutorials are linked from <http://sci2.wiki.cns.edu>



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## Network Extraction: Examples

Author co-occurrence network

	A	B
1	Publication	Authors
2	Paper1	A1
3	Paper2	A1;A2;A6
4	Paper3	A1;A3
5	Paper4	A1;A4;A5
6	Paper5	A5;A6
7	Paper6	A1;A2

Extract Network from Table

Extracts a network from a delimited table

Column Name: Authors

Text Delimiter: ;

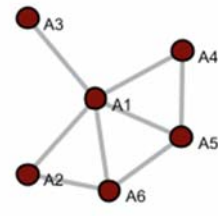
Extract Bipartite Network

Extract a bipartite network from two columns in the table. If the column values may list multiple entries, enter the special text which delimits them.

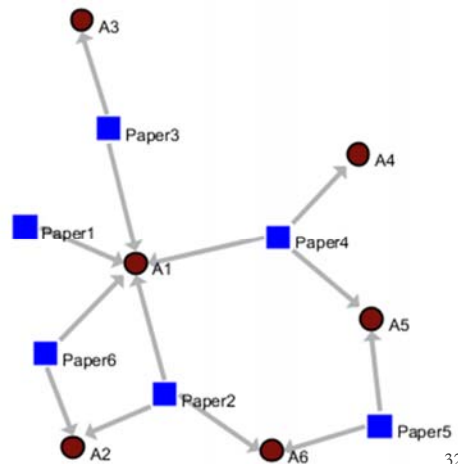
First column: Publication

Second column: Authors

Text Delimiter: ;



Paper-author 2-mode network







## Using the Sci2 Tool to analyze VIVO Data: Faculty-Courses Bipartite Networks

Use *File > Load* to load cleaned *SLIS-Faculty-Courses.csv*

	A	B		A	B
1	personName	courseTitle			
2	Park, Taemin	SLIS L597 - Topics On Libr & Info Science (Advanced Bibliographic Control)			
3	Park, Taemin	SLIS S504 - Cataloging			
4	Park, Taemin	SLIS L520 - Bibliographic Access & Control			
5	Park, Taemin	SLIS S631 - Advanced Cataloging	1	Jacob, Elin K.	27
6	Milojevic, Stasa	SLIS S503 - Representation & Organization	2	Rosenbaum, Howard S.	23
7	Milojevic, Stasa	SLIS L505 - Org & Rep Of Knowledge & Info	3	Herring, Susan Catherine	22
			4	Bantin, Philip Charles	20
			5	Choksy, Carol E B	14
			6	Ding, Ying	14

Total of 52 people teaching 319 courses.

Pivot table of #unique courses per faculty is on right.

No course is taught by more than 3 faculty:

	A	B
1	SLIS G901 - Advanced Research	3
2	SLIS L524 - Information Sources & Services	3
3	SLIS L528 - Collection Development & Mgmt	3
4	SLIS L546 - User-Centered Database Design	3
5	SLIS L554 - Education Of Information Users	3
6	SLIS L571 - Info Architecture For The Web	3
7	SLIS L574 - Comm In Elec Info Environments	3
8	SLIS L579 - Information Visualization	3
9	SLIS L597 - Topics On Libr & Info Science (Structrl Dataming & Modeling)	3

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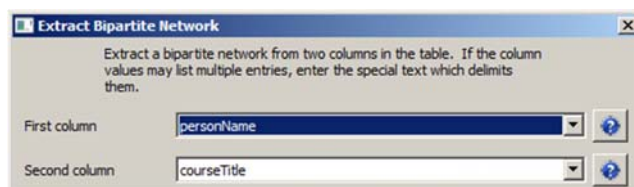
## Using the Sci2 Tool to analyze VIVO Data: Faculty-Courses Bipartite Networks

Use *File > Load* to load cleaned *SLIS-Faculty-Courses.csv*

	A	B
1	personName	courseTitle
2	Park, Taemin	SLIS L597 - Topics On Libr & Info Science (Advanced Bibliographic Control)
3	Park, Taemin	SLIS S504 - Cataloging
4	Park, Taemin	SLIS L520 - Bibliographic Access & Control
5	Park, Taemin	SLIS S631 - Advanced Cataloging
6	Milojevic, Stasa	SLIS S503 - Representation & Organization
7	Milojevic, Stasa	SLIS L505 - Org & Rep Of Knowledge & Info

Run *Data Preparation > Extract Bipartite Network*

With parameter values:

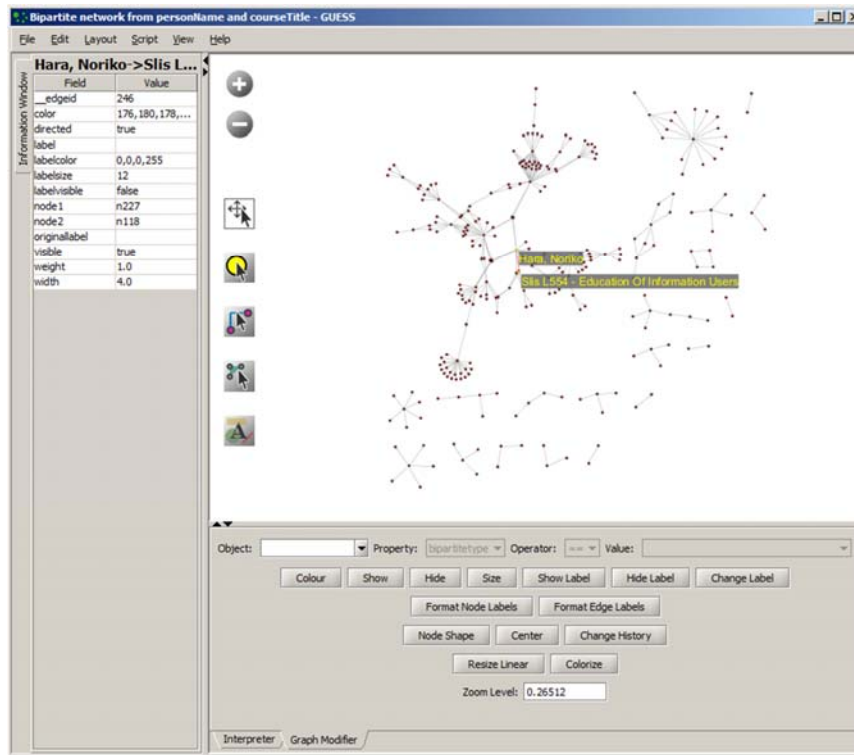


Visualize resulting *Bipartite network from personName and courseTitle* using *Visualization > Network > GUESS* and *Layout > GEM*, *Layout > Bin Pack*

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## Using the Sci2 Tool to analyze VIVO Data: Faculty-Courses Bipartite Networks




### Pan:

“grab” the background by holding left-click and moving your mouse.

### Zoom:

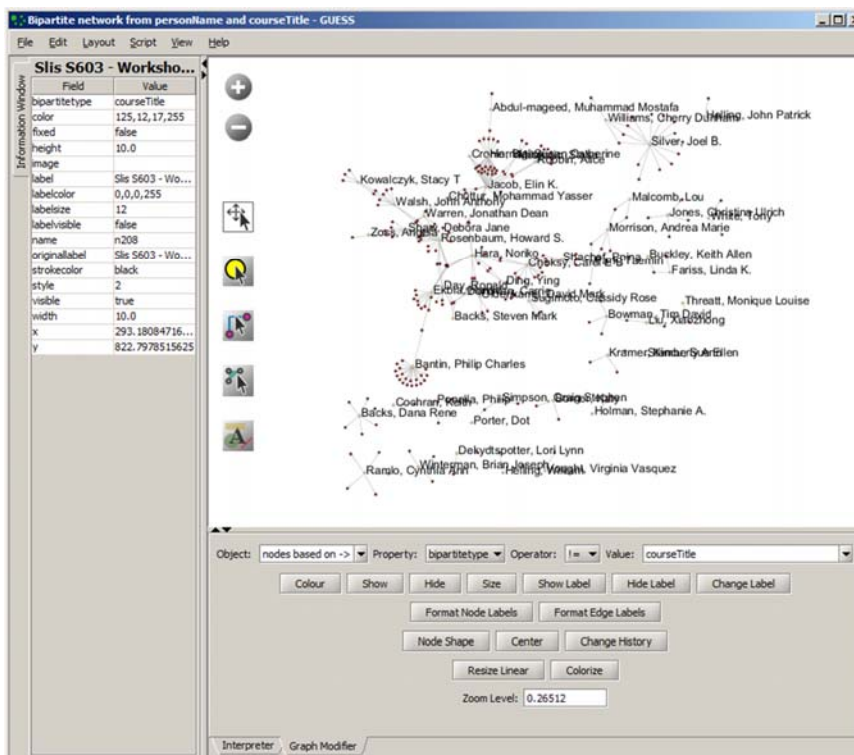
Using scroll wheel, press the “+” and “-” buttons in the upper-left hand corner, or right-click and move the mouse left or right. Center graph by selecting ‘View -> Center’.

Select  to select/move single nodes. Hold down ‘Shift’ to select multiple. Right click to modify Color, etc.

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## Using the Sci2 Tool to analyze VIVO Data: Faculty-Courses Bipartite Networks



### Graph Modifier:

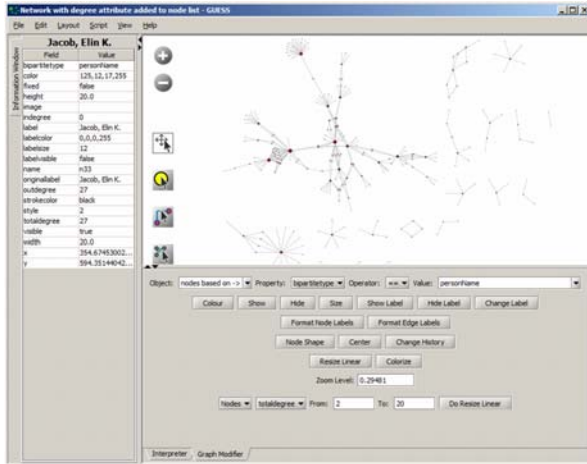
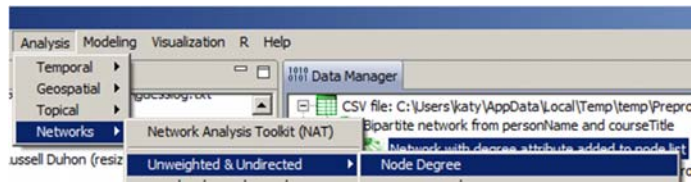
Select Object: nodes based on Property: bipartitetype Operator : == Value: personName then click ‘Show Label’ button and Colour to pick a color..

Select “Format Node Labels”, replace default text {originallabel} with your own label in the pop-up box ‘Enter a formatting string for node labels.’

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## Using the Sci2 Tool to analyze VIVO Data: Faculty-Courses Bimodal Networks



### Graph Modifier:

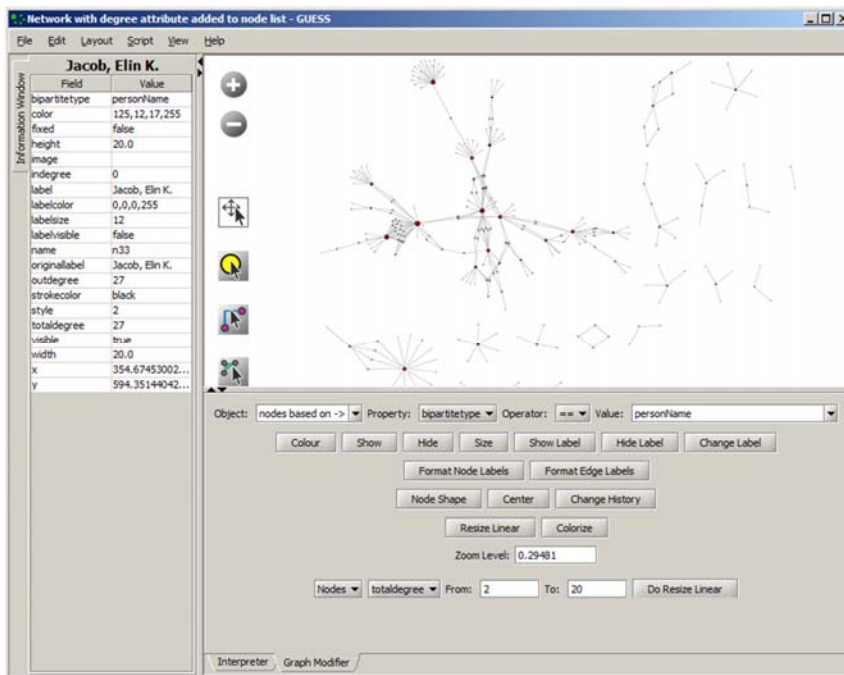
IF node Degree was calculated in Sci2, select 'Resize Linear > Nodes > totaldegree' in drop-down menu, then type "5" and "20" into the "From" and "To" Value box separately. Then select 'Do Resize Linear'.

Select 'Colorize > Nodes > totaldegree', then select white and enter (204,0,51) in the pop-up color boxes on in the "From" and "To" buttons.

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## Using the Sci2 Tool to analyze VIVO Data: Faculty-Courses Bipartite Networks



### Graph Modifier:

IF node Degree was calculated in Sci2, select 'Resize Linear > Nodes > totaldegree' in drop-down menu, then type "5" and "20" into the "From" and "To" Value box separately. Then select 'Do Resize Linear'.

Select 'Colorize > Nodes > totaldegree', then select white and enter (204,0,51) in the pop-up color boxes on in the "From" and "To" buttons.

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## Using the Sci2 Tool to analyze VIVO Data: Faculty-Courses Bipartite Networks

**Interpreter:**  
Uses Jython a combination of Java and Python.  
Try  
colorize(totaldegree, white, red)

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## Using the Sci2 Tool to analyze VIVO Data: Co-Author networks

Use 'File > Load' to load cleaned *YingDing-Co.Authors.csv* or *KatyBorner-Co-Authors.csv*

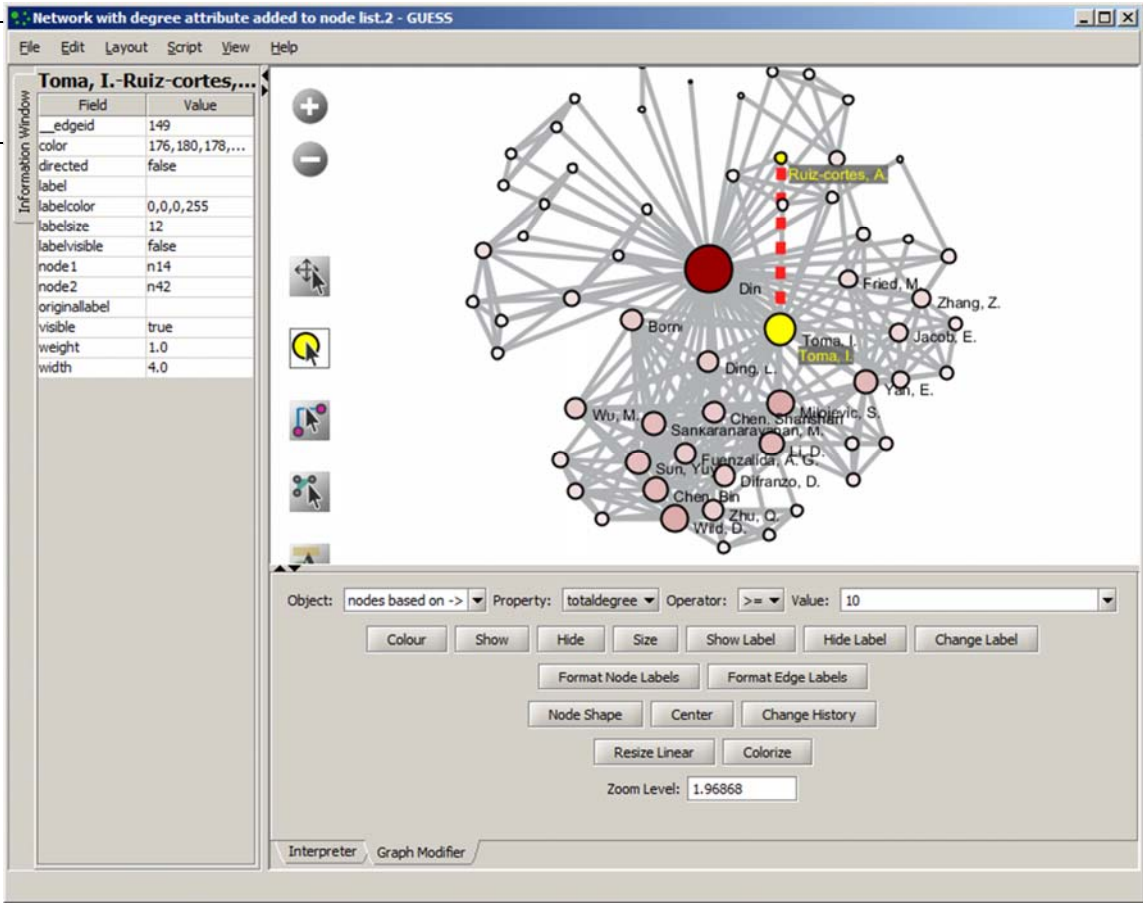
	A	B
1	PublicationTitle	Authors
2	113 Years of Physical Review: U Borner, Katy;Penumarthy, Shashikant;Herr II, Bruce W.;Hardy, Elisha F.;Duhon, Russell J.	
3	Analyzing and Visualizing the S Borner, Katy;Holloway, Todd;Bozicevic, Miran	

Run 'Data Preparation > Extract Co-Occurrence Network'

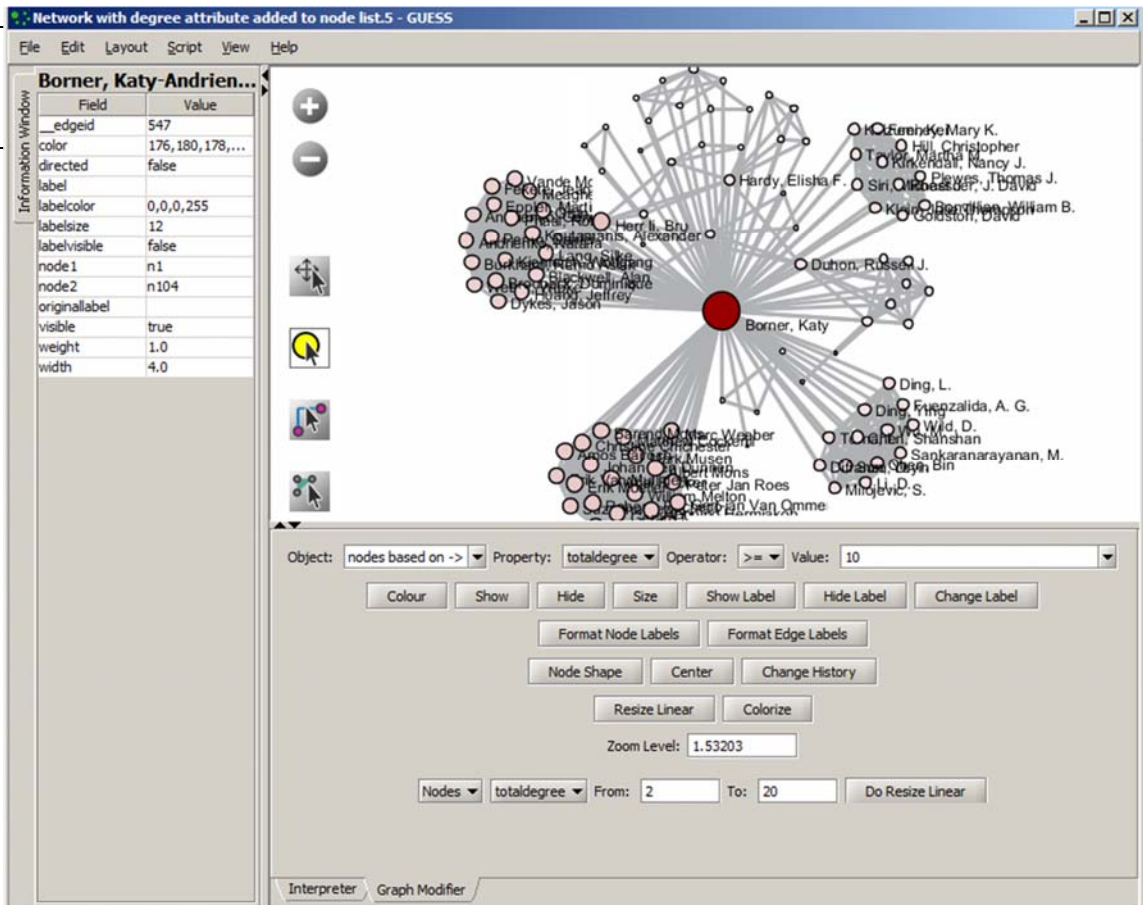
With parameter values:

Visualize resulting 'Bipartite network from personName and courseTitle' using 'Visualization > Network > GUESS' and 'Layout > GEM', 'Layout > Bin Pack'

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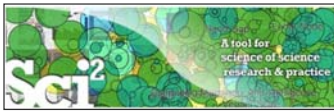
## Using the Sci2 Tool and Gephi to analyze VIVO Data: Co-Author networks

The screenshot shows the Sci2 Tool interface. The 'Visualization' menu is open, and 'Networks' is selected. Below it, 'GUESS' and 'Gephi' are visible. The main window shows a network graph with nodes and edges. A 'Preview Settings' dialog is open on the left, showing various options for node and edge visualization. The console window at the top left contains the following text:

```

Integration (g): vivotool loading
Reference: Battista, G., Eades, P., Tamassia, R., and Tollis, I
Graph Drawing: Algorithms for the Visualization of Graphs. Pre
Documentation:
http://wiki.cns.iu.edu/display/CISELL/Radial+Tree-
+%28prefuse+alpha%29
  
```

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## Using the Sci2 Tool to analyze VIVO Data: Paper to Co-Author Bipartite Networks

Use 'File > Load' to load cleaned *KatyBorner-Co-Authors.csv*

	A	B
1	PublicationTitle	Authors
2	113 Years of Physical Review: U Borner, Katy;Penumarthy, Shashikant;Herr II, Bruce W.;Hardy, Elisha F.;Duhon, Russell J.	
3	Analyzing and Visualizing the S Borner, Katy;Holloway, Todd;Bozicevic, Miran	

Run 'Data Preparation > Extract Bipartite Network'

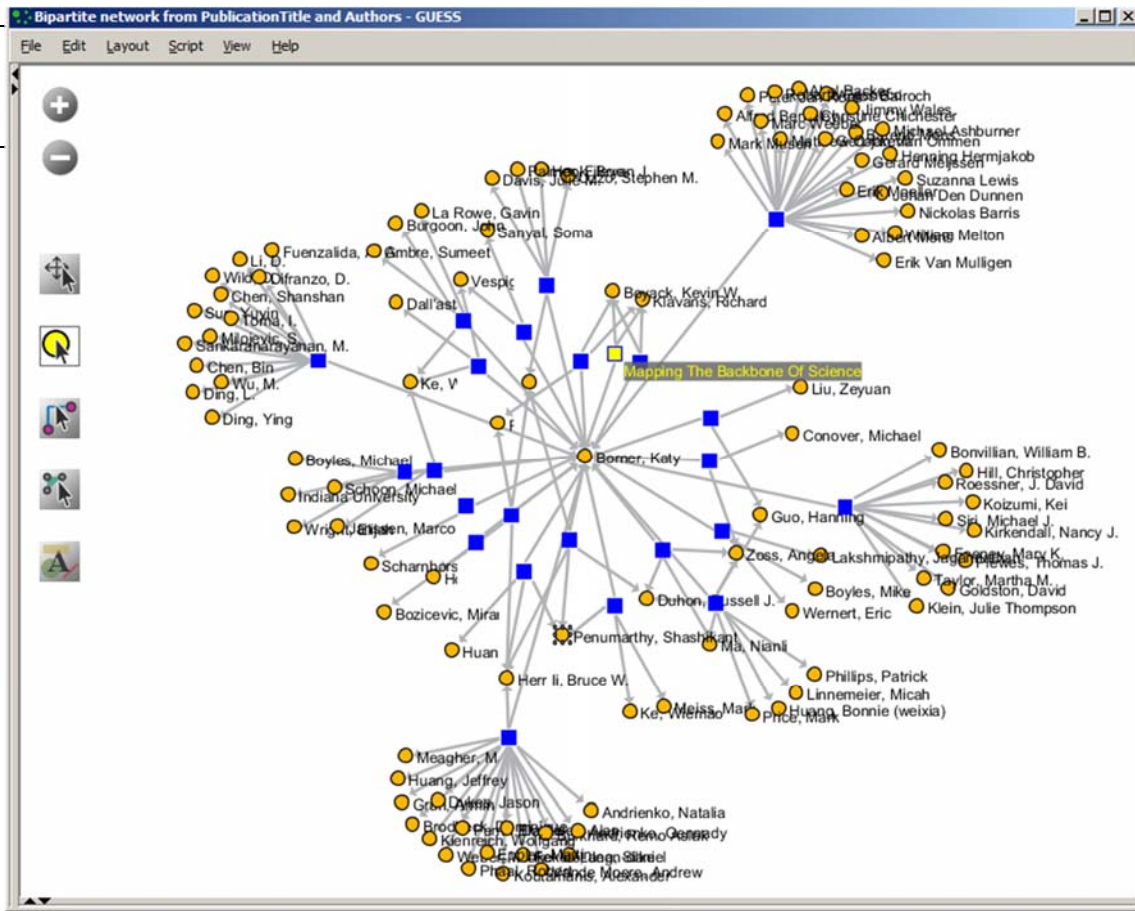
With parameter values:

The screenshot shows the 'Extract Bipartite Network' dialog box. It contains the following fields:

- First column: PublicationTitle
- Second column: Authors
- Text Delimiter: ;

Visualize resulting bipartite network using 'Visualization > Network > GUESS' and 'Layout > GEM', 'Layout > Bin Pack'

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## Using the Sci2 Tool to analyze VIVO Data: Geoffrey Fox Funding Data

Use *File > Load* to load cleaned *GeoffreyFox-Funding.csv*

	A	B	C	D
1	Title	Start	End	Amount
2	XROADS: Planning the future eXtreme Digital Cyb	5/1/2009	7/31/2010	154949
3	ERDC PET Support (Computer Science Corp.)	7/1/2001	9/30/2001	41574
4	QuakeSim: Enabling Model Interactions in Solid E	2/27/2007	9/30/2009	75000
5	Earthquake Data Enhanced Cyber-Infrastructure f	10/12/2009	9/30/2010	45000

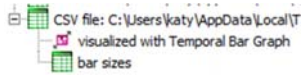
Run *Visualization > Temporal > Temporal Bar Graph* with parameter values:

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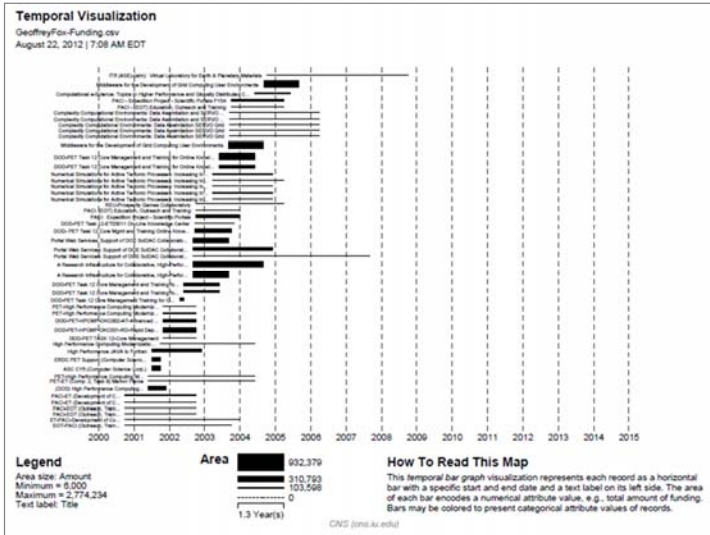


# Using the Sci2 Tool to analyze VIVO Data: Geoffrey Fox Funding Data

Result will be rendered into a Postscript file (red icon)



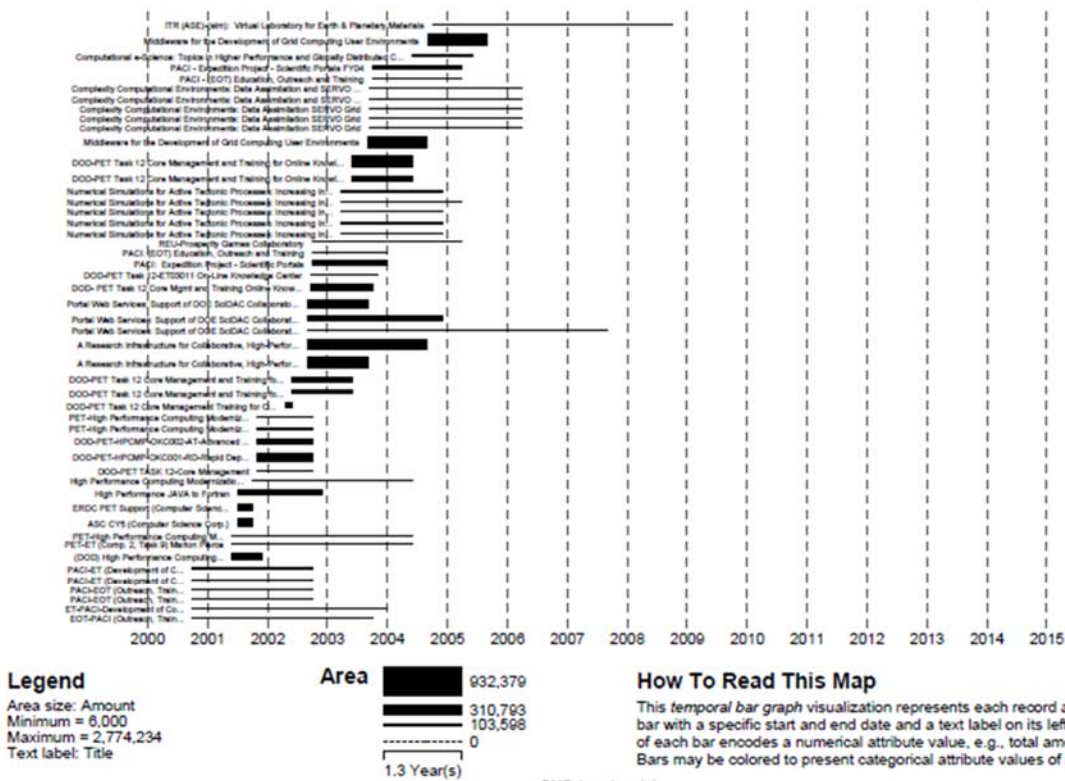
Save as ps file, convert into pdf and view:



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## Temporal Visualization

GeoffreyFox-Funding.csv  
August 22, 2012 | 7:08 AM EDT



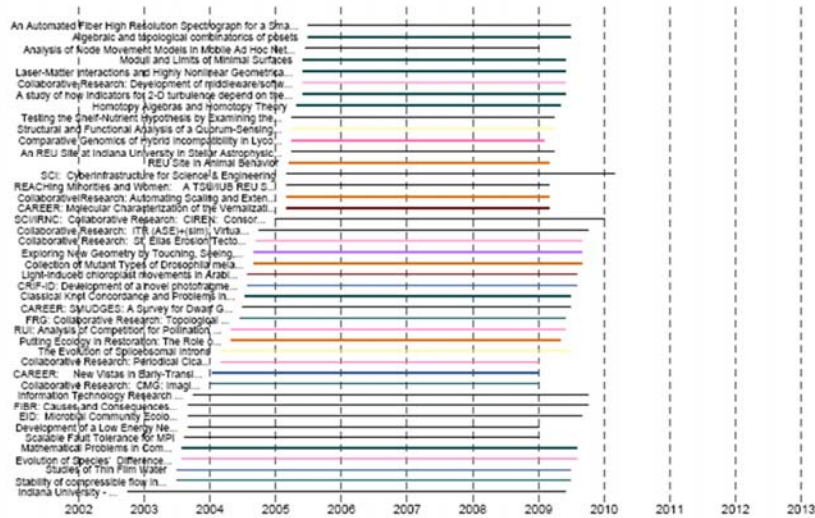




# Temporal Visualizations

## Temporal Visualization

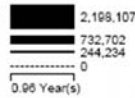
Generated from NSF csv file: C:\Users\katy\Desktop\TOOLS\Sci2-2012.06.04-KNAW\sampled\datascientometrics\indiana.csv  
 June 05, 2012 | 4:50 PM EDT



### Legend

Area size: Award Number  
 Minimum = 220,560  
 Maximum = 952,043  
 Text label: Title  
 Color: NSF Organization  
 See end of PDF for color legend.

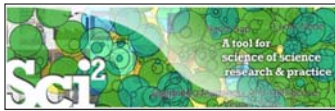
### Area



### How To Read This Map

This temporal bar graph visualization represents each record as a horizontal bar with a specific start and end date and a text label on its left side. The area of each bar encodes a numerical attribute value, e.g., total amount of funding. Bars may be colored to present categorical attribute values of records.

CNS (cns.iu.edu)



# Geospatial Visualizations

## Geospatial Visualization (Choropleth Map)

Generated from CSV file: Preprocessed-usptoInfluenza-8383730930137543104.csv  
 Jun 05, 2012 | 05:45:00 PM EDT



### Legend



### How to Read this Map

This choropleth map shows 206 countries of the world using the equal-area Eckert IV projection. Each country may be color coded in proportion to a numerical value. Minimum and maximum data values are given in the legend.

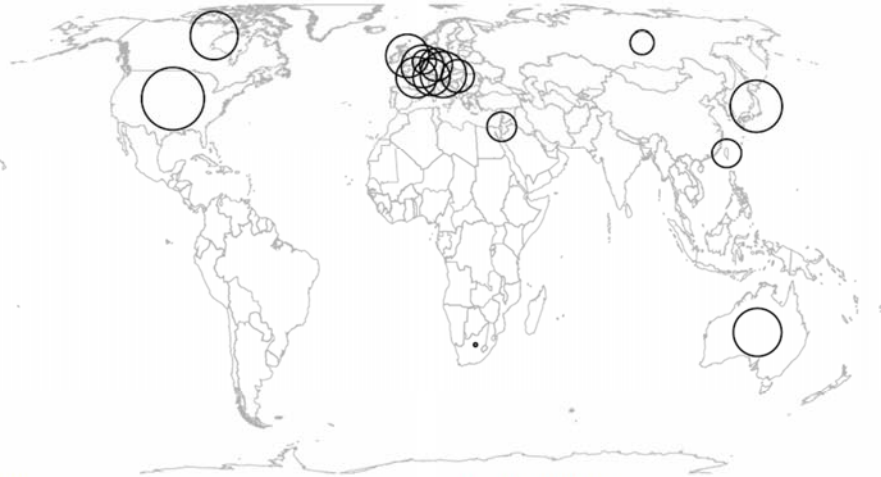
CNS (cns.iu.edu)



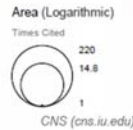
# Geospatial Visualizations

## Geospatial Visualization (Proportional Symbol Map)

Generated from CSV file: C:\sci2\sampledata\geolustolnfluenza.csv  
 Jun 14, 2012 | 05:56:39 PM EDT

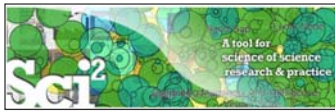


### Legend



### How to Read this Map

This proportional symbol map shows 209 countries of the world using the equal-area Eckert IV projection. Each dataset record is represented by a circle centered at its geolocation. The area, interior color, and exterior color of each circle may represent numeric attribute values. Minimum and maximum data values are given in the legend.



# Topical Visualization

## Topical Visualization

Generated from 361 Unique ISI Records of 4 NetSci Researchers  
 14 out of 109 publications were mapped to 94 subdisciplines and 12 disciplines.  
 June 05, 2012 | 05:39 PM EDT



### Legend

Circle area: Fractional Journal Count  
 Unclassified = 95  
 Minimum = 0  
 Maximum = 25  
 Color: Discipline  
 See end of PDF for color legend.

### Area



### How To Read

The UCSD map are aggregated color and is labeled unique subdisci assigned record:

- Chemistry
  - 1 COMPUTER PHYSICS COMMUNICATIONS
  - 2 JOURNAL OF CHEMICAL INFORMATION AND COMPUTER SCIENCES
  - 3 JOURNAL OF THE ROYAL INSTITUTE OF SCIENCE
  - 4 PURE AND APPLIED CHEMISTRY
- Earth Sciences
  - 1 CURRENT SCIENCE

**Data:** WoS and Scopus paper level data for 2001–2010, about 25,000 separate journals, proceedings, and series.

**Similarity Metric:** Combination of bibliographic coupling and keyword vectors.

**Number of Disciplines:** 554 journal clusters further aggregated into 13 main scientific disciplines that are labeled and color coded in a metaphorical way, e.g., Medicine is blood red and Earth Sciences are brown as soil.

## Workshop Schedule

Hands-On (Katy Borner)

- Analysis & Visualization of VIVO Data using the Science of Science Tool (<http://sci2.cns.iu.edu>)

15 min break

Guided Tour (Chin Hua Kong)

- Walk through Co-author Network visualization

Guided Tour (Katy Borner)

- Analysis & Visualization of VIVO Data by others

Q&A

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## Workshop Review

- 2011 VIVO visualization workshop
  - <http://wiki.cns.iu.edu/display/PRES/VIVO+Presentation>
  - Visualizing organization hierarchy data
  - Creating a new VIVO visualization
- 2012 VIVO visualization workshop
  - <http://wiki.cns.iu.edu/display/PRES/VIVO+Presentation>
  - Learn from 2011 visualization workshop and new requests from vivo development mailing list
  - Visualizing data downloaded from VIVO visualization page
  - Visualizing publication and teaching data from VIVO
  - Learn how to customize the ego-centric network visualization (used for co-author network and co-investigator network)

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# VIVO Visualization

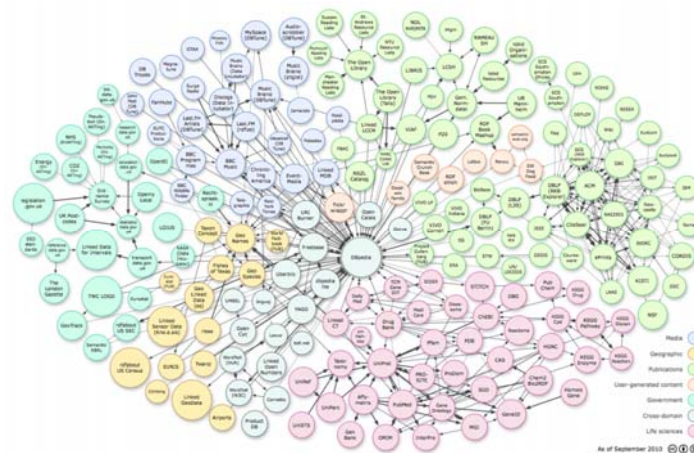
- Accessing VIVO Data
- Architecture
- Pipeline Explanation

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## Accessing VIVO Data



- Read “The Semantic Web: An Introduction”  
<http://infomesh.net/2001/swintro>



author: Chris Bizer

taken from: [http://linkeddatabook.com/editions/1.0/images/lod-cloud\\_2010.png](http://linkeddatabook.com/editions/1.0/images/lod-cloud_2010.png)

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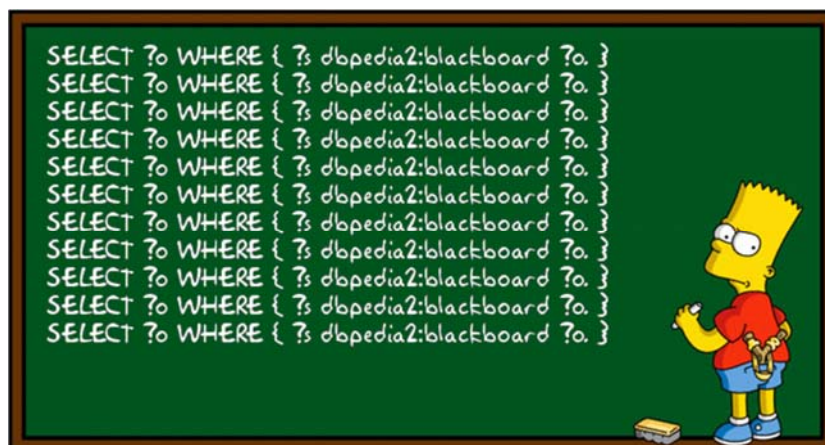
## Linked Open Data (via RDF or N3)

- Accessible to anyone on the Web.
- It can be a bit tedious to work with large amounts of data quickly/easily.
- N3 example:
  - <http://vivo.iu.edu/individual/person25557/person25557.n3>
- RDF example:
  - <http://vivo.iu.edu/individual/person25557/person25557.rdf>
- VIVO Ontology
  - <http://sourceforge.net/apps/mediawiki/vivo/index.php?title=Ontology>

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## SPARQL Endpoints

- Working with data is easier/faster (using SPARQL queries).
- But may not be accessible to everyone.



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# VIVO Visualization

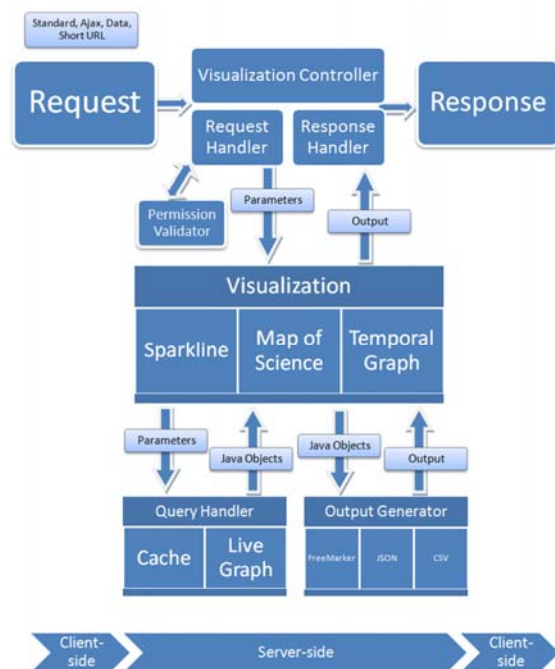
- Accessing VIVO Data
- Architecture
- Pipeline Explanation

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## VIVO Visualization Architecture



1. User requests the visualization
2. Request is received by the VIVO application
3. Specific controller gets control
4. Controller delegates the control of flow to the handler of the requested visualization, if permission validated
5. The handler passes request information to the Query Handler
6. Query Handler queries the semantic web data store (cached or live)
7. Results of the query are converted into Java objects
8. Java objects are used to generate response in the requested format
9. Request handler renders the generated response



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# VIVO Visualization

- Accessing VIVO Data
- Architecture
- Pipeline Explanation

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## Map of Science Visualization Pipeline

- Breakdown of serving the *map of science* visualization request received at, <http://vivo.iu.edu/vis/map-of-science/IndianaUniversity>

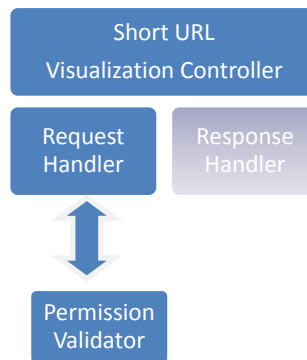
Request

- Short URL Request
- It has following parameters,
  - **/vis** – Short URL prefix
  - **/map-of-science** – Visualization type
  - **/IndianaUniversity** – URI of subject of the visualization
- Long form looks like

```
http://vivo.iu.edu/visualization
?vis=map-of-science
&uri=http://vivo.iu.edu/individual/IndianaUniversity
```

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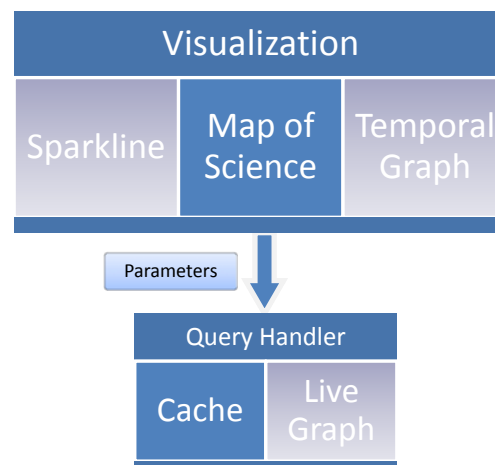
## Map of Science Visualization Pipeline



- */vis* – Short URL Visualization Controller assumes the control of flow
- Parse URL to get visualization type – Map Of Science
- Gets permission requirements for Map of Science visualization
- Validates it against the requesting user’s privileges

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## Map of Science Visualization Pipeline



- After validation captured parameters are passed to the Map of Science Visualization
- Check cache for all models pertaining to “IndianaUniversity” entity
- If not present create models and store in cache

64

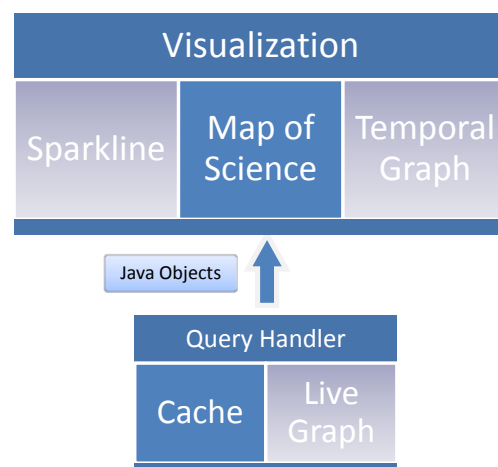


# Map of Science Visualization Pipeline

- Models used are,
  - ORGANIZATION\_MODEL\_WITH\_TYPES
    - no input uri
    - all sub-organizations recursively
  - ORGANIZATION\_TO\_PUBLICATIONS\_FOR\_SUBORGANIZATIONS
    - specific for an input uri
    - all publications for entity-associated people
  - ORGANIZATION\_ASSOCIATED\_PEOPLE\_MODEL\_WITH\_TYPES
    - specific for an input uri
    - e.g. President of University
  - PEOPLE\_TO\_PUBLICATIONS
    - no input uri
    - all people associated with publication

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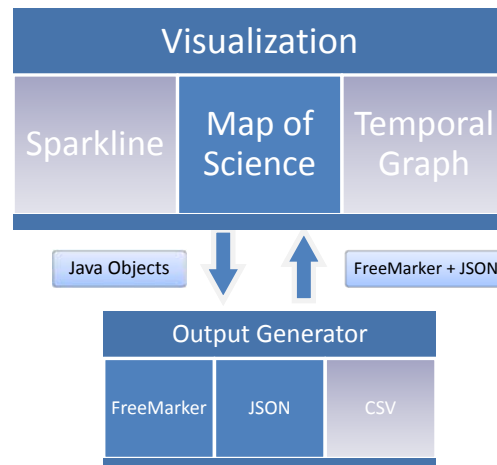
# Map of Science Visualization Pipeline



- SPARQL query fired against the previous mentioned cache
- Using the query results create the java objects
  - Entity (for subject entity)
  - SubEntity (for child entities)
  - Activity (for publication info)

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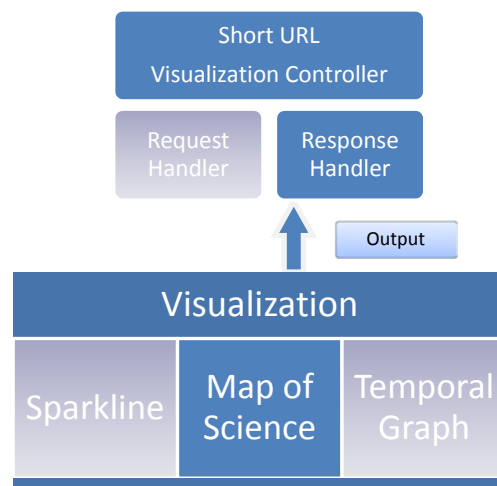
## Map of Science Visualization Pipeline



- Java objects used to generate output
- FreeMarker object
  - HTML markup including CSS, JavaScript
- JSON
  - Used by JavaScript to render tables, map etc

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## Map of Science Visualization Pipeline

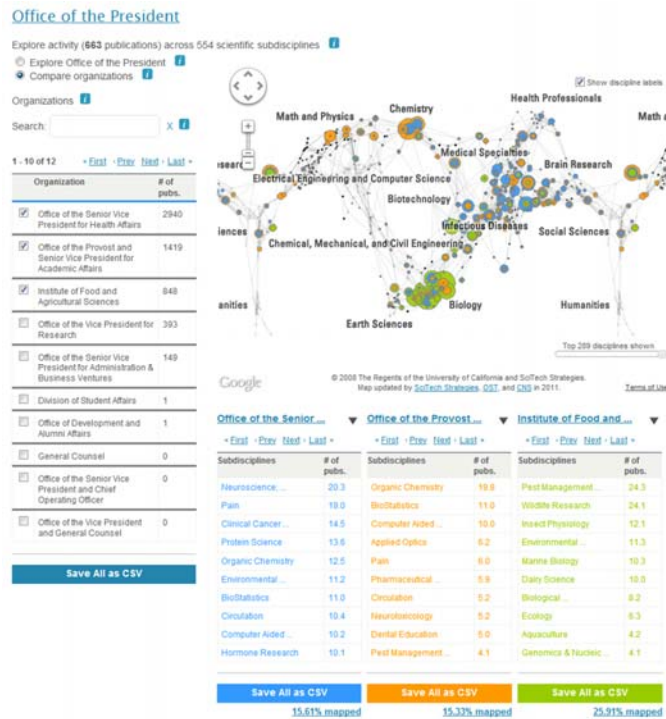


- Output from visualization (FreeMarker + JSON) sent to Response Handler
- Makes sure output formatted properly
  - E.g. For FreeMarker – compile HTML markup

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# Map of Science Visualization Pipeline

Response



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## Workshop Schedule

Hands-On (Katy Borner)

- Analysis & Visualization of VIVO Data using the Science of Science Tool (<http://sci2.cns.iu.edu>)

15 min break

Guided Tour (Chin Hua Kong)

- Walk through Co-author Network visualization

Guided Tour (Katy Borner)

- Analysis & Visualization of VIVO Data by others

Q&A

70

# Walk through Co-author Network visualization

- 2011 workshop slides: <http://wiki.cns.iu.edu/display/PRES/VIVO+Presentation>
- Pre-implementation
  - Identify the data to be represented
  - Research Visualization to present the data
  - Visualization technologies
- Front-End module
  - Create Front-End module that renders the data created by the back-end
- Back-End module
  - Create SPARQL Queries to get the data
  - Edit Back-End module for new data
- Dependency Injection

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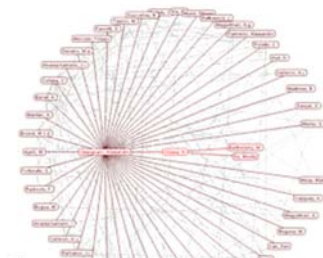
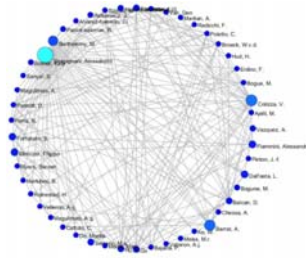
# Identify the data to be represented

- What data is available?
- Who is the target audience?
- What story do you want to tell?
- Why is the story important for your users?
- Integrity of the data.

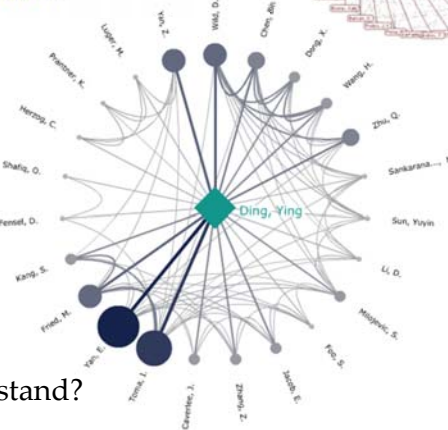
72

# Research visualization to present the data

- Existing visualizations



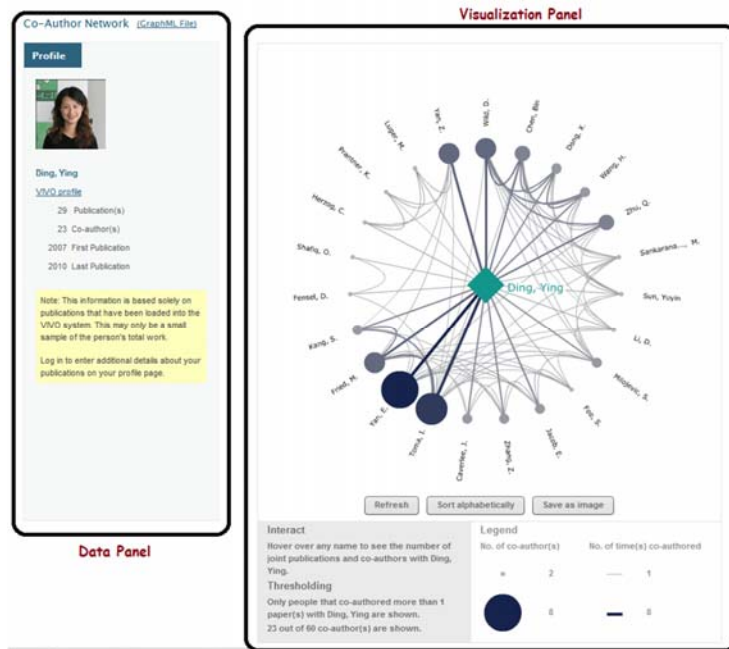
- Mockup + Sampling with Sci2
- Frontend technology
- Target users environment
- Is the visualization easy to understand?



# Visualization Technologies

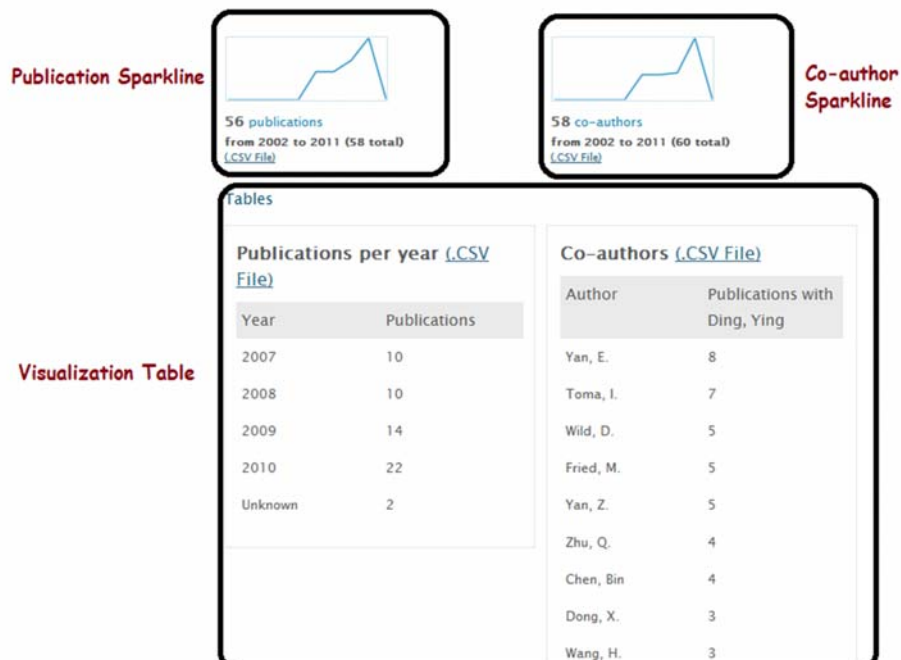
- Front-End
  - HTML
  - FLASH
  - JSON
  - CSV
  - GRAPHML
  - JavaScript
- Back-End
  - Java
  - FreeMarker
  - SPARQL
  - Ontology

# Mock-up of the desired goal



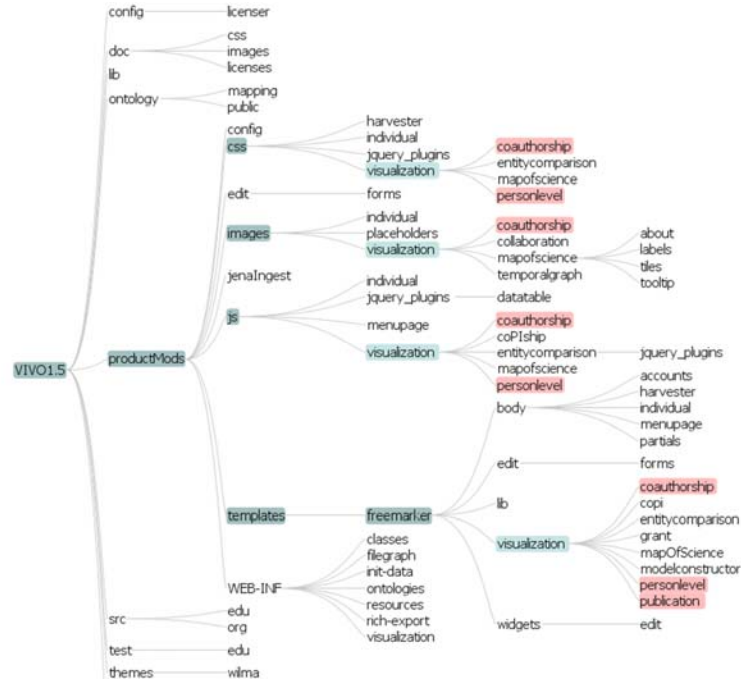
75

# Pre-implementation result



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# Front-End Module



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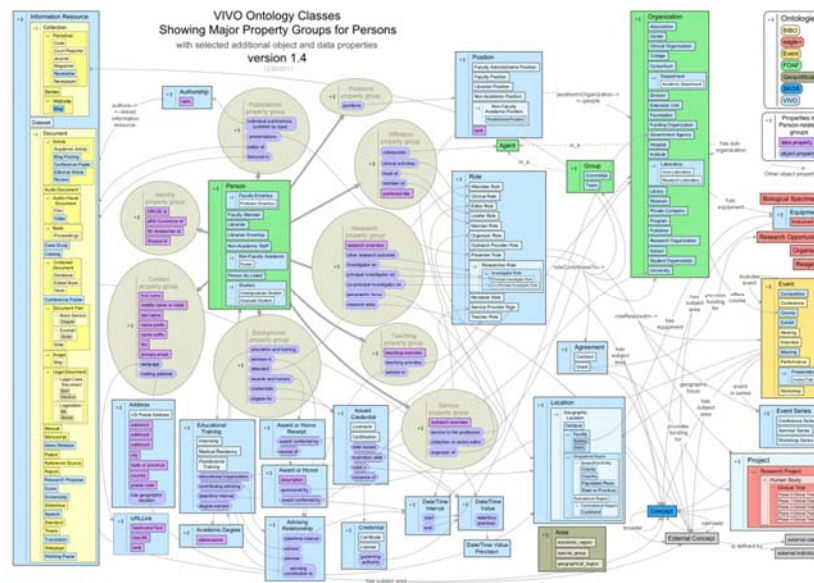
# Front-End Module

- Co-author network related modules
  - /coauthorship – custom for **Co-author Sparkline** widget
  - /publication – generate **Publication Sparkline** widget
  - /personlevel – **Main HTML page** shared between co-author network and co-investigator network
  
- Create coauthorship folders in images, css, js, and templates folders
  - Copy images, js, and css libraries in to newly created coauthorship folders
  
- Customize the HTML contents into freemarker (.ftl) files
  - **Main HTML page** content:  
/productMods/templates/freemarker/visualization/personlevel/coAuthorPersonLevel.ftl
  - **Co-author Sparkline** content:  
/productMods/templates/freemarker/visualization/coauthorship/\*
  - **Publication Sparkline** content:  
/productMods/templates/freemarker/visualization/publication/\*

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# Back-End Module

VIVO Ontology wiki: <http://sourceforge.net/apps/mediawiki/vivo/index.php?title=Ontology>



VIVO 1.4 Ontology overview diagram

# Back-End module

- Create SPARQL Queries to get co-author network information for a person

```
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
```

```
PREFIX core: <http://vivoweb.org/ontology/core#>
```

```
SELECT DISTINCT ?name ?coAuthorLabel
```

```
WHERE
```

```
{
```

```
<http://vivo.iu.edu/individual/person751182> rdfs:label ?name.
```

```
<http://vivo.iu.edu/individual/person751182> core:authorInAuthorship ?authorship .
```

```
?authorship core:linkedInformationResource ?pub .
```

```
?pub core:informationResourceInAuthorship ?coAuthorship .
```

```
?coAuthorship core:linkedAuthor ?coAuthor.
```

```
?coAuthor rdfs:label ?coAuthorLabel.
```

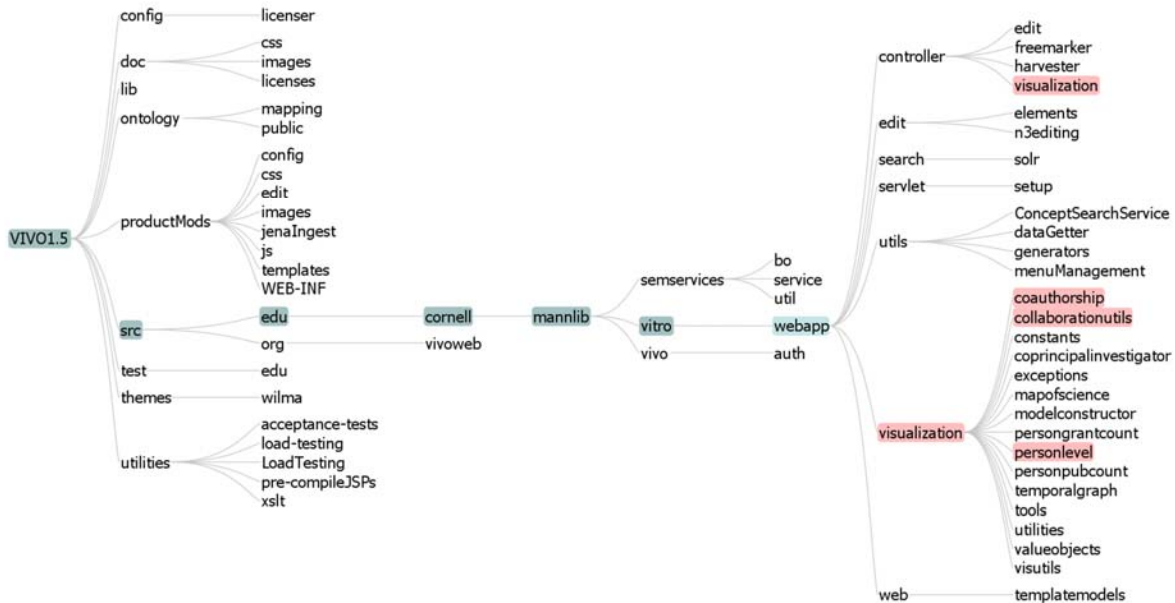
```
FILTER (<http://vivo.iu.edu/individual/person751182> != ?coAuthor)
```

```
}
```

name	coAuthorLabel
"Ding, Ying"@en-US	Frantner, K.\n
"Ding, Ying"@en-US	Luger, M.\n
"Ding, Ying"@en-US	Yan, Z.\n
"Ding, Ying"@en-US	Herzog, C.\n
"Ding, Ying"@en-US	Wild, D.\n
"Ding, Ying"@en-US	Challa, S.\n
"Ding, Ying"@en-US	Purohit, P.\n
"Ding, Ying"@en-US	Lajiness, M.\n
"Ding, Ying"@en-US	Zhu, Q.\n
"Ding, Ying"@en-US	Scharffe, F.\n



## Back-End Module



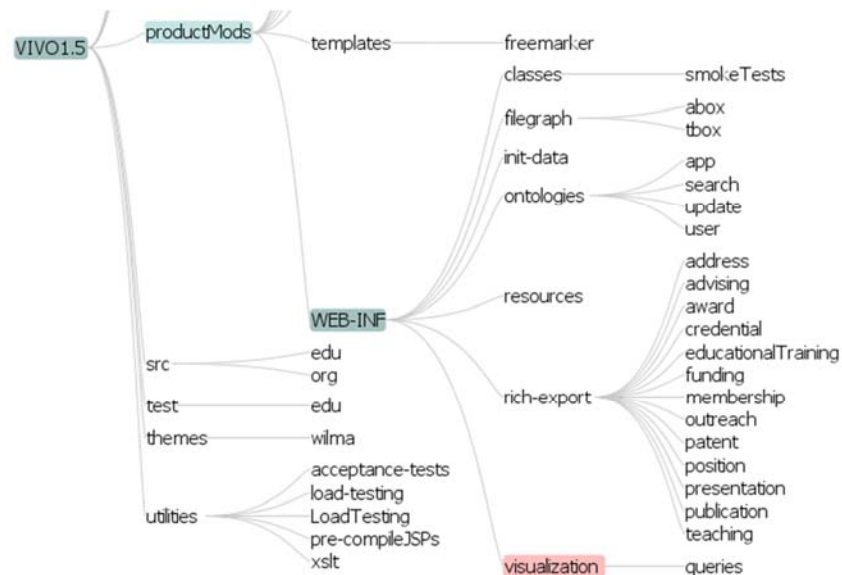
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## Back-End Module

- Create package for “coauthorship” along with other visualizations
- Query Runner
  - SPARQL Query
    - edu.cornell.mannlib.vitro.webapp.visualization.coauthorship.CoAuthorshipQueryRunner
  - Java Objects:
    - edu.cornell.mannlib.vitro.webapp.visualization.collaborationutils.CoAuthorshipData
- Visualization Request Handler
  - edu.cornell.mannlib.vitro.webapp.controller.visualization.PersonLevelRequestHandler
  - edu.cornell.mannlib.vitro.webapp.visualization.coauthorship.CoAuthorshipRequestHandler
  - Get input from controller: PersonLevelRequestHandler
  - Requests Query Runner to get data (Model to be cached?)
    - See Jena model tutorial at <http://jena.sourceforge.net/tutorial/>
  - Prepares data
    - FreeMarker config: PersonLevelRequestHandler
    - JSON output: CoAuthorshipRequestHandler
    - Graphml output (Specified for ego-centric): CoAuthorshipRequestHandler

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# Dependency Injection



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# Dependency Injection

- Wire pieces to get a complete pipeline
- RequestHandler injection
  - File: productMods/WEB-INF/visualization/visualizations-bean-injection-fm.xml
  - Register request handler with ID
 

```
<bean id="person_level"
class="edu.cornell.mannlib.vitro.webapp.visualization.personlevel.PersonLevelRequestHandler" />
```
  - Define request handler for vis mode
 

```
<entry key="author-network">
    <ref bean="person_level"></ref>
</entry>
```

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# End Product

<http://vivo.iu.edu/vis/author-network/person751182>

**Publications per year**

Year	Publications
2007	10
2008	10
2009	14
2010	22
Unknown	2

**Co-authors**

Author	Publications with Ding, Ying
Yan, E.	8
Toma, I.	7
Wild, D.	5
Fried, M.	5
Yan, Z.	5
Zhu, Q.	4
Chen, Bin	4

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# Workshop Schedule

Hands-On (Katy Borner)

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Guided Tour (Chin Hua Kong)

- Walk through Co-author Network visualization

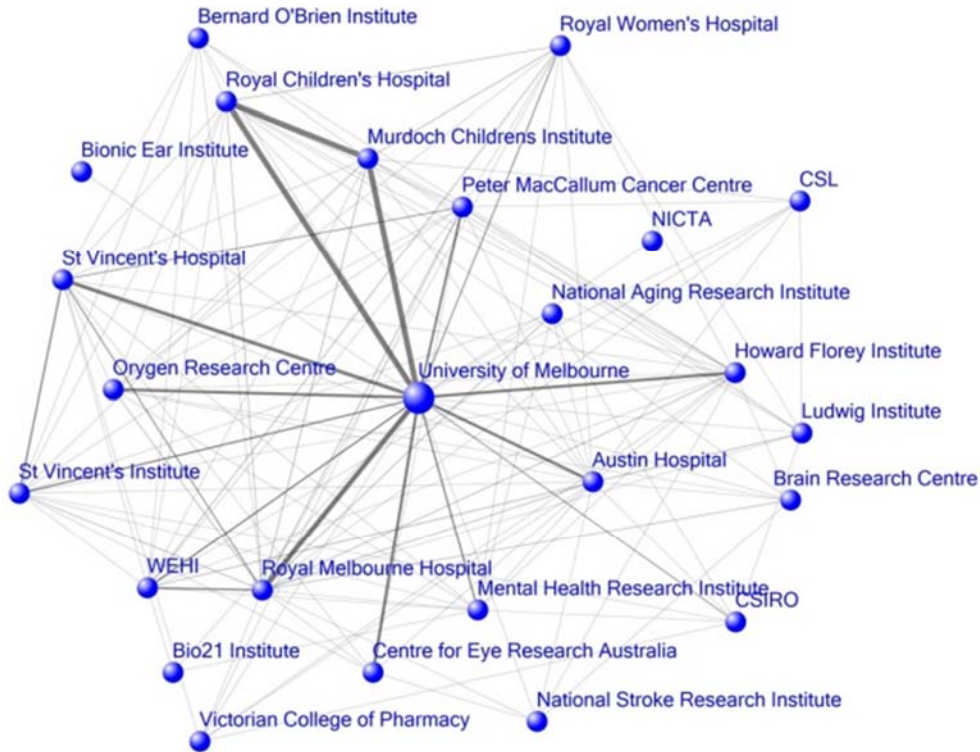
15 min break

Guided Tour (Katy Borner)

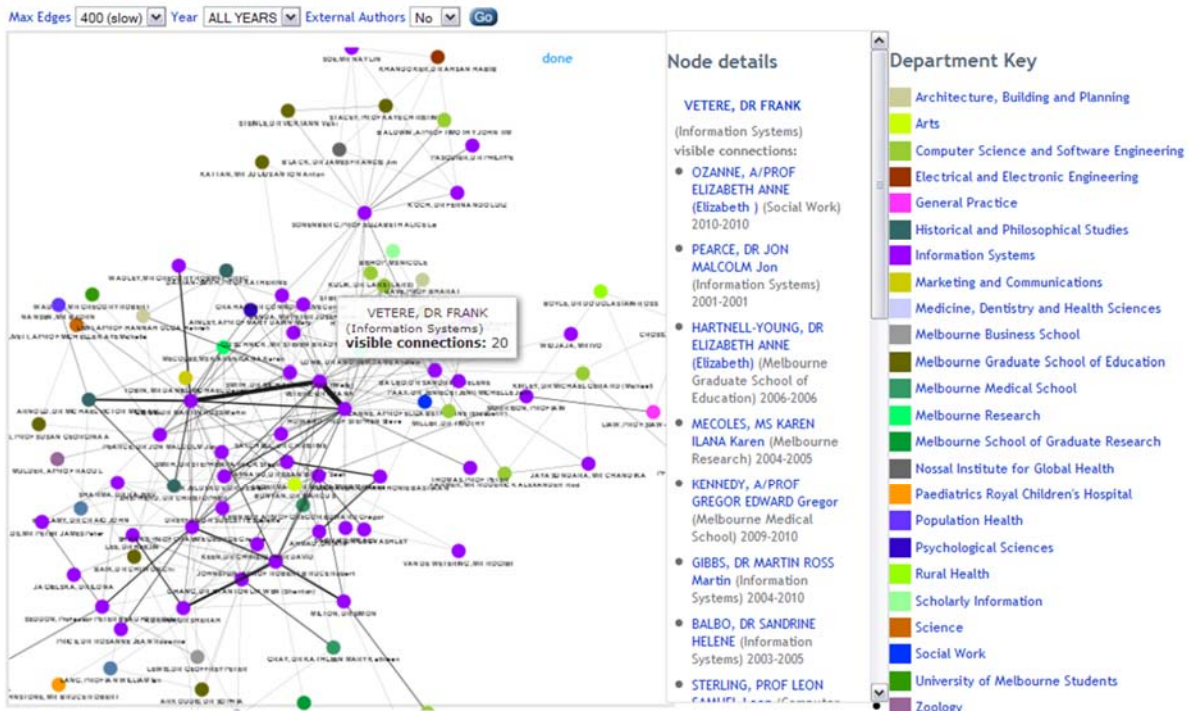
- Analysis & Visualization of VIVO Data by others

Q&A

86

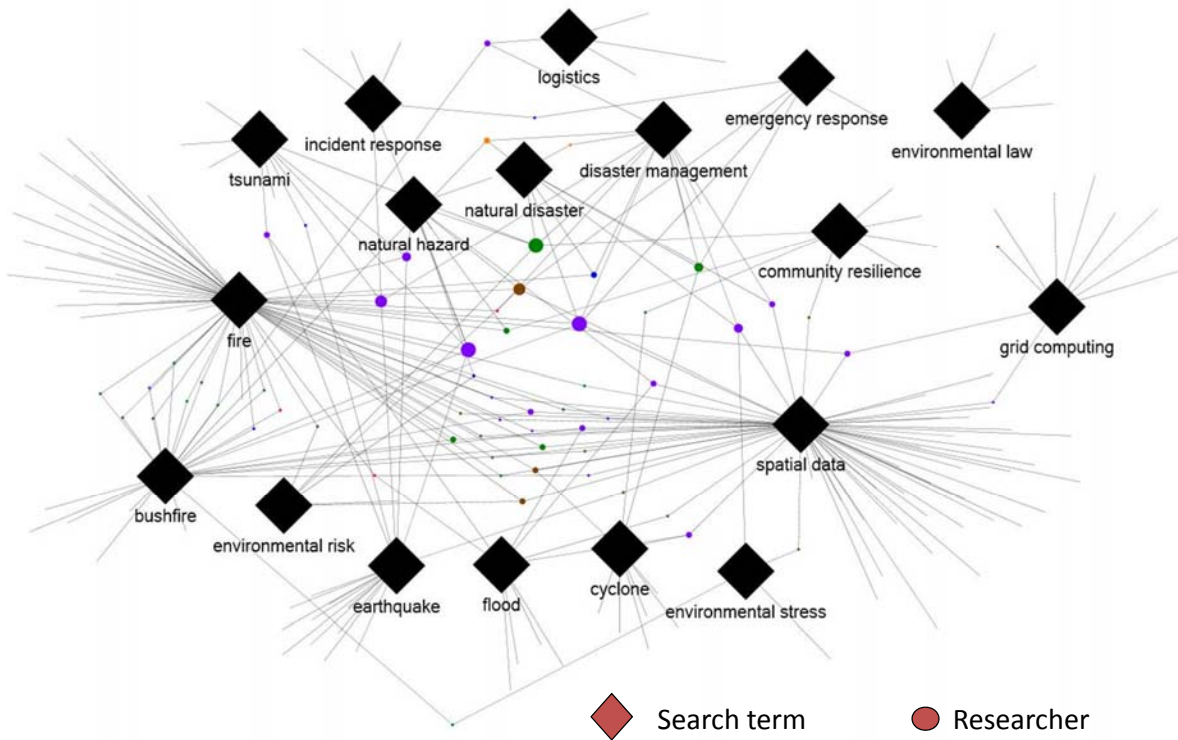


**2008 collaboration patterns for medical institutions located close to Melbourne University**  
 Source: Web of Science co authorship information. Compiled by Simon Porter

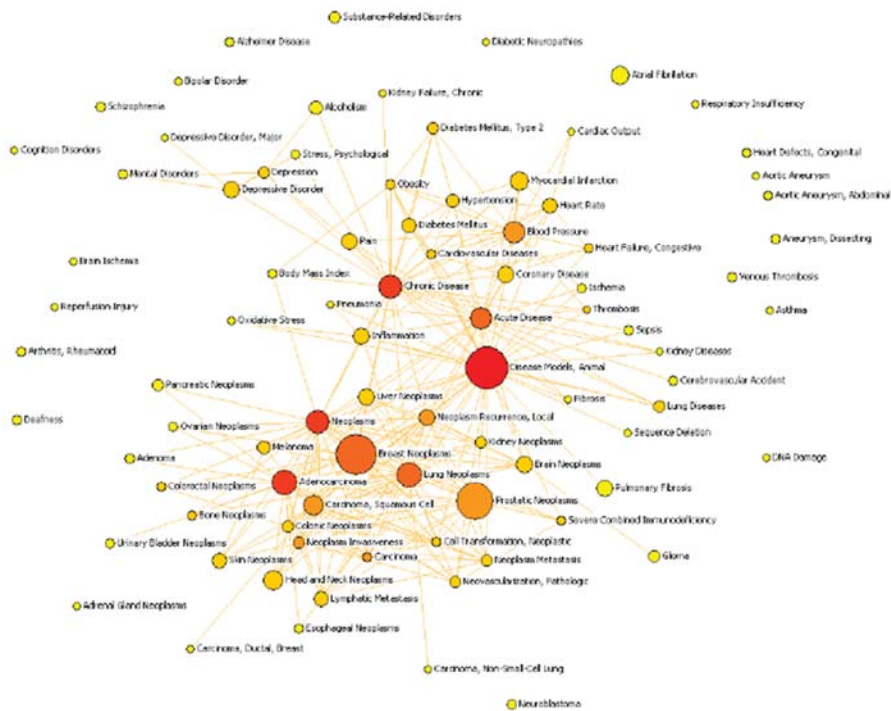


**Co-authorship network for the department of Information Systems**

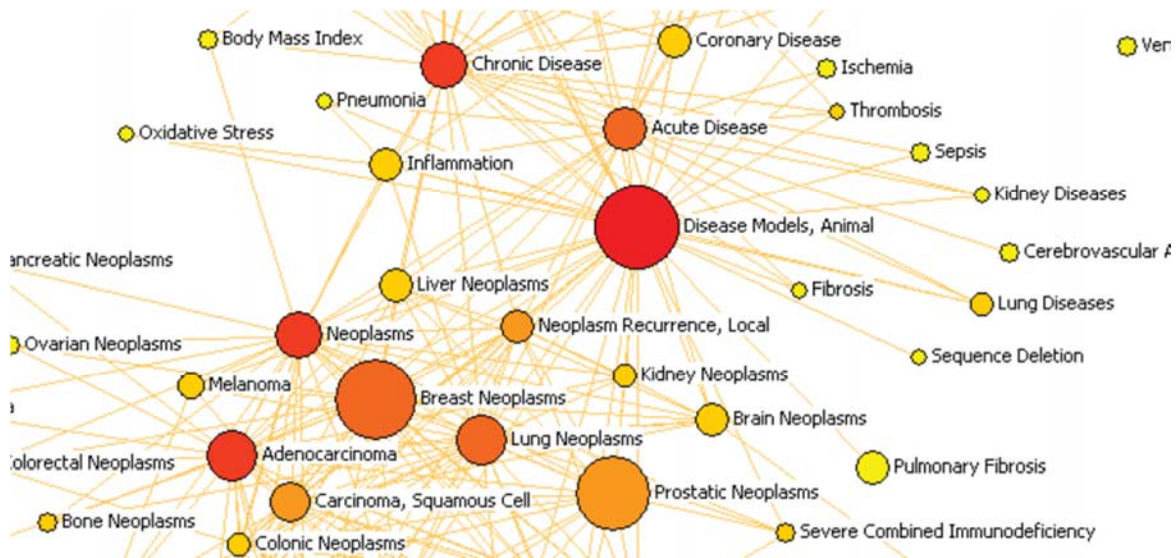
Source: Melbourne Research Windows. Contact Simon Porter [simon.porter@unimelb.edu.au](mailto:simon.porter@unimelb.edu.au)



Bimodal network of search terms and researchers extracted from research profile search results to show the **University's capability in Disaster Management** to the Government  
 Contact: [simon.porter@unimelb.edu.au](mailto:simon.porter@unimelb.edu.au)



**Top MeSH Disease Concepts Appearing in PubMed Publications by the University of Michigan Medical School.** Links connect concepts where 100+ authors published about both concepts within the span of their careers.  
 Contact: Jeffrey Horon, [J.Horon@elsevier.com](mailto:J.Horon@elsevier.com)

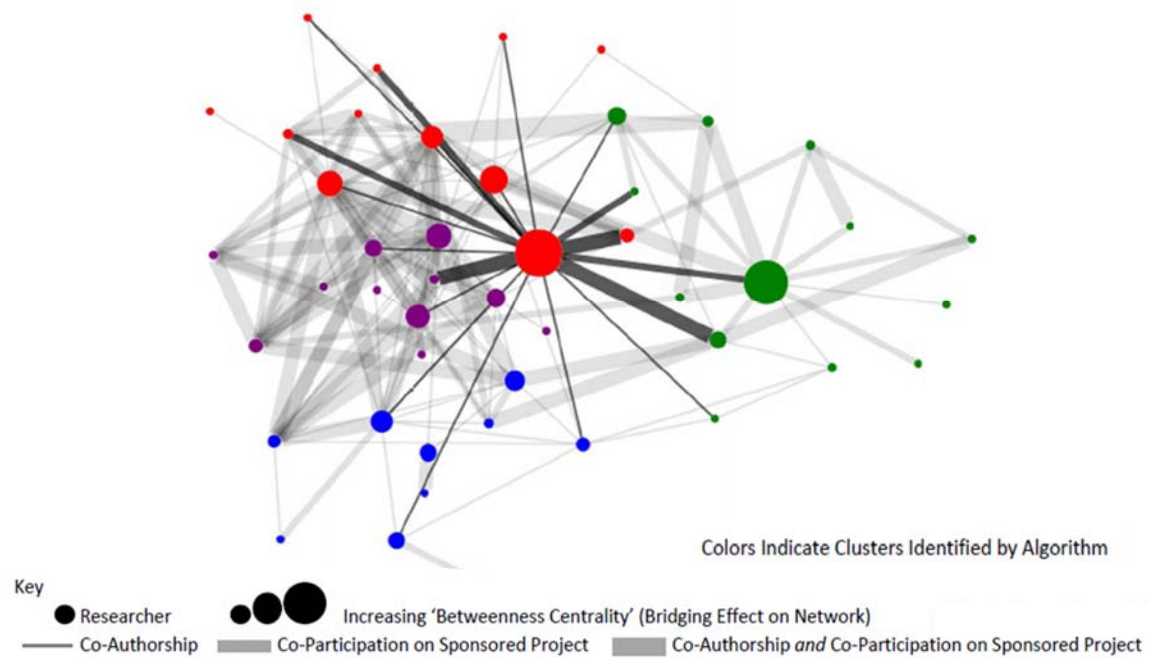


**Top MeSH Disease Concepts Appearing in PubMed Publications by the University of Michigan Medical School.** Links connect concepts where 100+ authors published about both concepts within the span of their careers.

This visualization revealed that animal disease models were central to disease research at U-M which encouraged additional thought and attention to animal husbandry, animal expenses, and core/shared services overall.

Contact: Jeffrey Horon, [J.Horon@elsevier.com](mailto:J.Horon@elsevier.com)

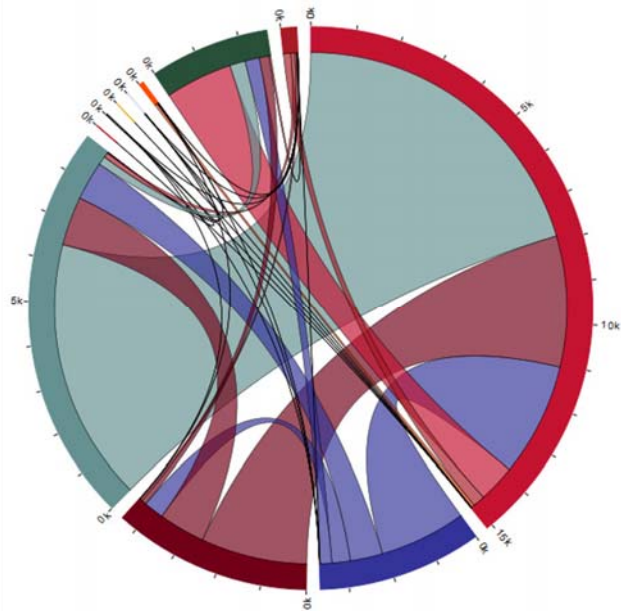
91



**P30 Member Collaborations – Sponsored Project Co-Participation and Co-Authorship Network.** Used in **successful!** P30 funding application. Shows the PI's relationships with various P30 members, conveying that the PI was not only the formal center of the group but also the informal center and the person who exhibited the highest betweenness centrality. Contact: Jeffrey Horon, [J.Horon@elsevier.com](mailto:J.Horon@elsevier.com)

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Institutions	
<input checked="" type="checkbox"/> <a href="#">Harvard Med School</a>	(15124)
<input checked="" type="checkbox"/> <a href="#">Northwestern Med School</a>	(3630)
<input checked="" type="checkbox"/> <a href="#">U. of Minnesota</a>	(4388)
<input checked="" type="checkbox"/> <a href="#">U. California at San Fran</a>	(8874)
<input checked="" type="checkbox"/> <a href="#">Cornell</a>	(1)
<input checked="" type="checkbox"/> <a href="#">Cornell Medical</a>	(32)
<input checked="" type="checkbox"/> <a href="#">Ponce School of Med</a>	(3)
<input checked="" type="checkbox"/> <a href="#">Scripps Research Institute</a>	(22)
<input checked="" type="checkbox"/> <a href="#">Univ. of Florida</a>	(100)
<input checked="" type="checkbox"/> <a href="#">Washington U at St. Louis</a>	(2635)
<input checked="" type="checkbox"/> <a href="#">Mendeley</a>	(352)



### Inter-Institutional Collaboration Explorer

This visualization shows information about “collaborative publications” found at 2 or more Researcher Networking websites.

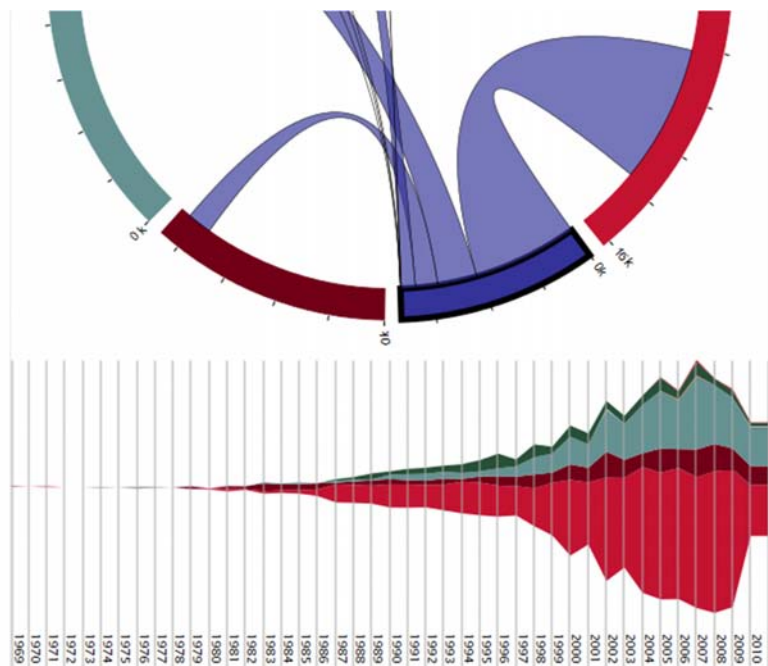
The idea that institutions don't work together and that biomedical research is conducted in silos is not true. Researchers, even when separated by great distances, are in fact willing to work together, and this visualization demonstrates that they often do.

Contact: Nick Benik ([nbenik@gmail.com](mailto:nbenik@gmail.com)), Harvard Medical School, Boston, MA.

URL: <http://xcite.hackerceo.org/VIVOviz>

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Institutions	
<input checked="" type="checkbox"/> <a href="#">Harvard Med School</a>	(1813)
<input checked="" type="checkbox"/> <a href="#">Northwestern Med School</a>	(3630)
<input checked="" type="checkbox"/> <a href="#">U. of Minnesota</a>	(396)



### Inter-Institutional Collaboration Explorer

The outer solid colored arcs represent the 11 institutions. The size of the arc is proportional to the number of collaborative publications found on the site. The inner colored bands represent the number of collaborative publications found between the two institutions that each band connects. Clicking an institution's arc will hide any bands not connected to that institution and will display a timeline of when that institution's collaborative publications were written.

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# Workshop Schedule

## Hands-On (Katy Borner)

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## Guided Tour (Chin Hua Kong)

- Customizing existing VIVO visualization

## Guided Tour (Katy Borner)

- Analysis & Visualization of VIVO Data by others

## Q&A