Faculty Profiling Systems at IU: VIVO et al.
Several slides are from a presentation to OVPR in 2010.

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I would like to thank Ryan Cobine and David Cliff for their input.

Faculty Data Working Group, IUB. Sept 10 at 3-4pm in Bryan Hall 104.

• What is VIVO?
• How does it work?
• How have we implemented it at Indiana University?
• How is it used?
• Incentives & challenges
VIVO Collaboration:

**Cornell University:** Dean Krafft (Cornell PI), Manolo Bevia, Jim Blake, Nick Cappadona, Brian Caruso, Jon Corson-Rikert, Elly Cramer, Medha Devare, John Fereira, 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 Bames, Narayan Raum, Brenda Stevens, Alicia Tumer, Stephen Williams. **Indiana University:** Katy Bomer (IU PI), William Barnett, Ryan Cobine, Shanshan Chen, Ying Ding, Russell Duhon, Jon Dunn, Micah Linnemeier, Nianli Ma, Brian Keese, 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 Tones. **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 Tumer, Vinay Varughese.

VIVO is:

A **semantic web application** that enables the discovery of research and scholarship across disciplines in an institution.

Populated with **detailed profiles** of faculty and researchers; displaying items such as pubs, classes, service, and affiliations.

A **powerful search functionality** for locating people and information within or across institutions.
VIVO is a resource of Indiana University that provides information on:

- people
- departments
- facilities
- courses
- grants
- publications

vivo.iu.edu

What is VIVO?

An open-source semantic web application that enables the discovery of research and scholarship across disciplines in an institution.

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A powerful search functionality for locating people and information within or across institutions.
VIVO harvests data from IU verified sources

Internal data sources:
- Faculty Systems (FAR > IUIE)
- HR System (HRMS > IUIE)
- Registrar System (SIS > IUIE)
- Research Data Systems (VPR > IUIE)
- Events and Seminars

External data sources:
- Publication warehouses - e.g. PubMed, Web of Science
- Grant databases: e.g. NSF/ NIH
- National Organizations: AAAS, AMA, etc.

Data stored as RDF triples using standard ontology

Faculty and unit administrators can then add additional information to their profile.

VIVO data is available for reuse by web pages, applications, and other consumers both within and outside the institution.

Linked Data Principles

- Tim Berners-Lee:
  - Use URIs as names for things
  - Use HTTP URIs so that people can look up those names
  - When someone looks up a URI, provide useful information, using the standards (RDF, SPARQL)
  - Include links to other URIs so that people can discover more things

- [http://www.w3.org/DesignIssues/LinkedData.html](http://www.w3.org/DesignIssues/LinkedData.html)
- [http://linkeddata.org](http://linkeddata.org)
- [http://data.gov.uk/](http://data.gov.uk/)
VIVO Standard Ontology


- Individual
  - Teaching (vivo:TeacherRole, vivo:AdvisingRelationship)
  - Services (vivo:Service, vivo:CoreLaboratory, vivo:MemberRole)
  - Expertise (vivo:SubjectArea)

Storing Data in VIVO

- Information is stored using the Resource Description Framework (RDF).
- Data is structured in the form of "triples" as subject-predicate-object.
- Concepts and their relationships use a shared ontology to facilitate the harvesting of data from multiple sources.

Ying Ding is member of SLIS.
Ying Ding has affiliations with Cognitive Science.
Ying Ding is author of a Book chapter.
SLIS is part of VIVO Ontology Team.
Book chapters are part of Books.
Book chapters are part of Journal articles.
Journal articles are part of Books.

<table>
<thead>
<tr>
<th>Subject</th>
<th>Predicate</th>
<th>Object</th>
</tr>
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<tr>
<td>Ying Ding</td>
<td>is member of</td>
<td>SLIS</td>
</tr>
<tr>
<td>Ying Ding</td>
<td>has affiliations with</td>
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<td>Ying Ding</td>
<td>author of</td>
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A VIVO profile will allow researchers to:

- Map colleagues by research area, authorship, and collaborations.
- Showcase credentials, expertise, skills, and professional achievements.
- Connect within research areas and geographic expertise.
- Display current research, and selected publications.
- Publish the URL or link the profile to other applications.
Incentives

- Federated Searching Across Domains
  - CTSA Federated Search
  - VIVO Federated Search
- NIH/NSF Biosketch Generation
- Mapped Data from IU Institutional Data Sources
  - 80/20
- Visualization and Scientometric Mapping Components

Visualization

- Display visualizations of complex research networks and relationships.
Topical Analysis (What)  
Science map overlays show where a person, department, or university publishes most in the world of science. (in work)
Future Current versions of VIVO do:

- **Generate** CVs and biosketches for faculty reporting or grant proposals - NIH/NSF.
- **Incorporate** external data sources for publications and affiliations.
- **Link** data to external applications and web pages.

Try it at [http://vivo.ufl.edu/display/n25562](http://vivo.ufl.edu/display/n25562)
IU currently has four systems—more than any other university I know is able to afford.

Only VIVO and IndianaCTSI have exchanged data. SciVal and Pivot are commercial solutions that are not interoperable.

Other universities have conducted extensive market studies - see comparison of 45 systems at [http://en.wikipedia.org/wiki/Comparison_of_Research_Networking_Tools_and_Research_Profiling_Systems](http://en.wikipedia.org/wiki/Comparison_of_Research_Networking_Tools_and_Research_Profiling_Systems) - and decided to implement a combination of SciVal (to purchase publications) and VIVO (to be compliant with many other systems that expose their data using the VIVO ontology in support of national search and other services across profiling instances).

Many universities are using their Faculty Profiling System to compile large teams in response to funding solicitations. Purdue has connected their profiling system to their FAR like 'Digital Measures' system and will soon be able to analyze and visualize their impact in new ways.

I believe we all would benefit if IU commits to one Faculty Profiling System but it will take IU leadership to make this happen.
Data in VIVO at IU

VIVO development instance
- Bloomington faculty (source: IUIE data warehouse)
- IUPUI faculty (source: IUIE data warehouse)
- IU CTSI personnel (source: CTSI Portal, IUIE data warehouse)
- Inclusion of a faculty member entails basic HR data (appointments, rudimentary contact info), academic courses taught in last five years, and federal or federal pass-through grant awards for which they were PI or co-PI.
- IUCTSI personnel may additionally include a research overview and research area keywords.
- IUB and IUPUI organizational structure

VIVO production instance
- Bloomington faculty (source: IUIE data warehouse)
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Provost Robel suggested to explore linking VIVO and FAR—this would considerably improve data quality and coverage.

VIVO Usage at IU

Networks and Complex Systems Research at Indiana University

This VIVO instance provides information on networks and complex systems

- Faculty and their departments
- Publications
- Grants
- Courses

at Indiana University. The site was created in support of a NSF IGERT grant application. A major intent is to cross-fertilize between research done in the social and behavioral sciences, research in natural sciences such as biology or physics, but also research on Internet technologies.

The site will be continuously updated to help
- New faculty to get in contact with relevant researchers.
- Faculty and policy makers to pool teams in response to funding solicitations.
- Faculty to coordinate research efforts — collaborations using existing funding/resources.
- Faculty to coordinate teaching.
- Students identify relevant courses, potential advisors, funding
- Organize the Mon talk series on Networks and Complex Systems
- Arrange research meetings for visitors with relevant faculty/students
- Communicate networks and complex systems research at IU via interlinked web pages to the world.

We welcome all comments and suggestions. Please feel free to contact Katy Bomer katy@indiana.edu at the Cyberinfrastructure for Network Science Center, SLIS, IUB. Make sure to use “VIVO.NetSci” in the subject header.

http://vivo-netsci.slis.indiana.edu
**VIVO Usage at UMICH**

*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

**VIVO Usage at IU**

We started to run analyses of teaching/funding/affiliation data from [http://vivo.iu.edu](http://vivo.iu.edu) to identify collaborations/connections/overlaps for the SLIS-SOIC merger.

The very same analyses might be valuable for other reorganization efforts.

There are about 10 science of science/scientometrics scholars at IUB and several of us would be interested to perform more detailed studies or to provide advise.
Questions?

Katy Bomer  
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Robert McDonald  
robert@indiana.edu

Thank you!