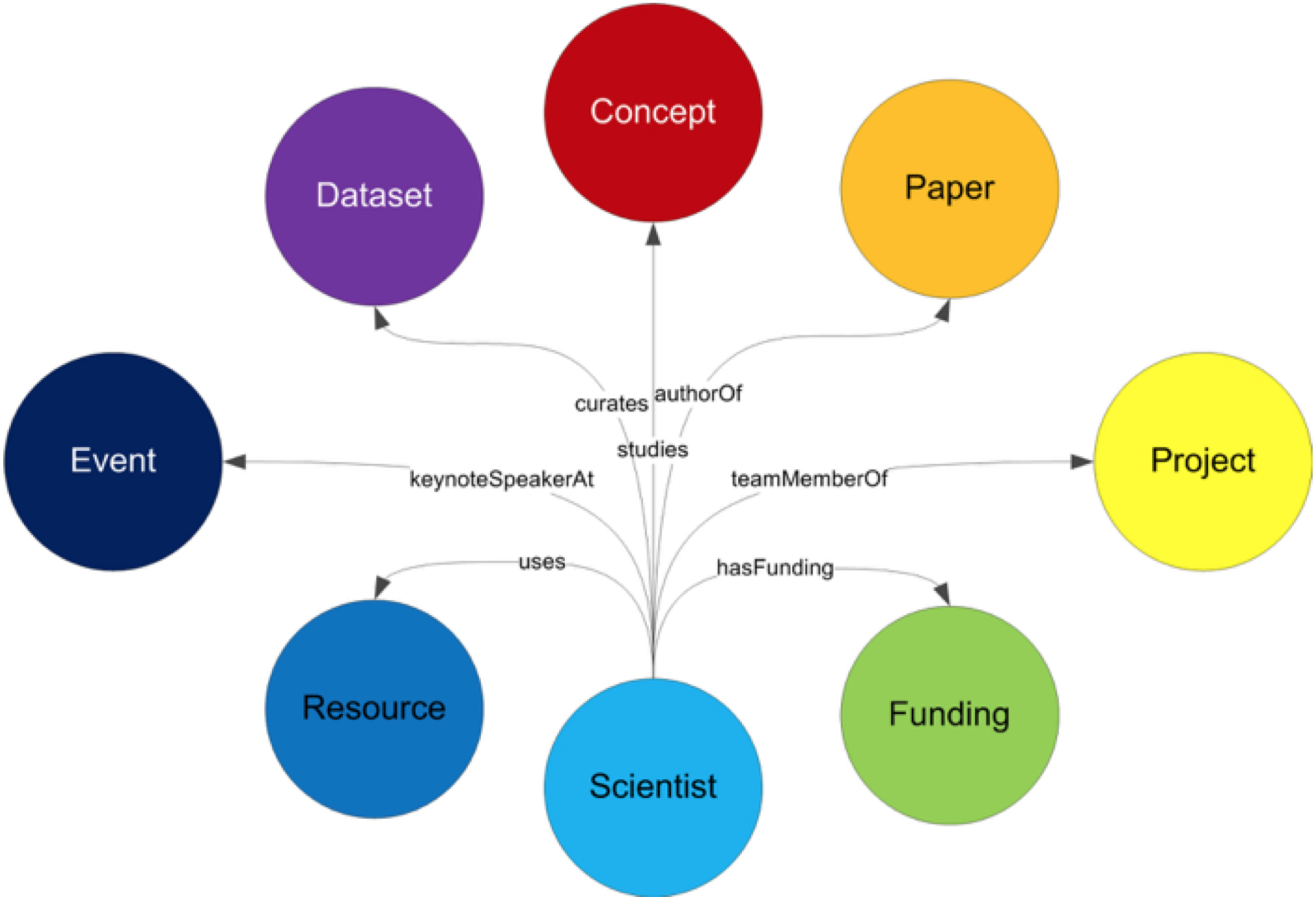
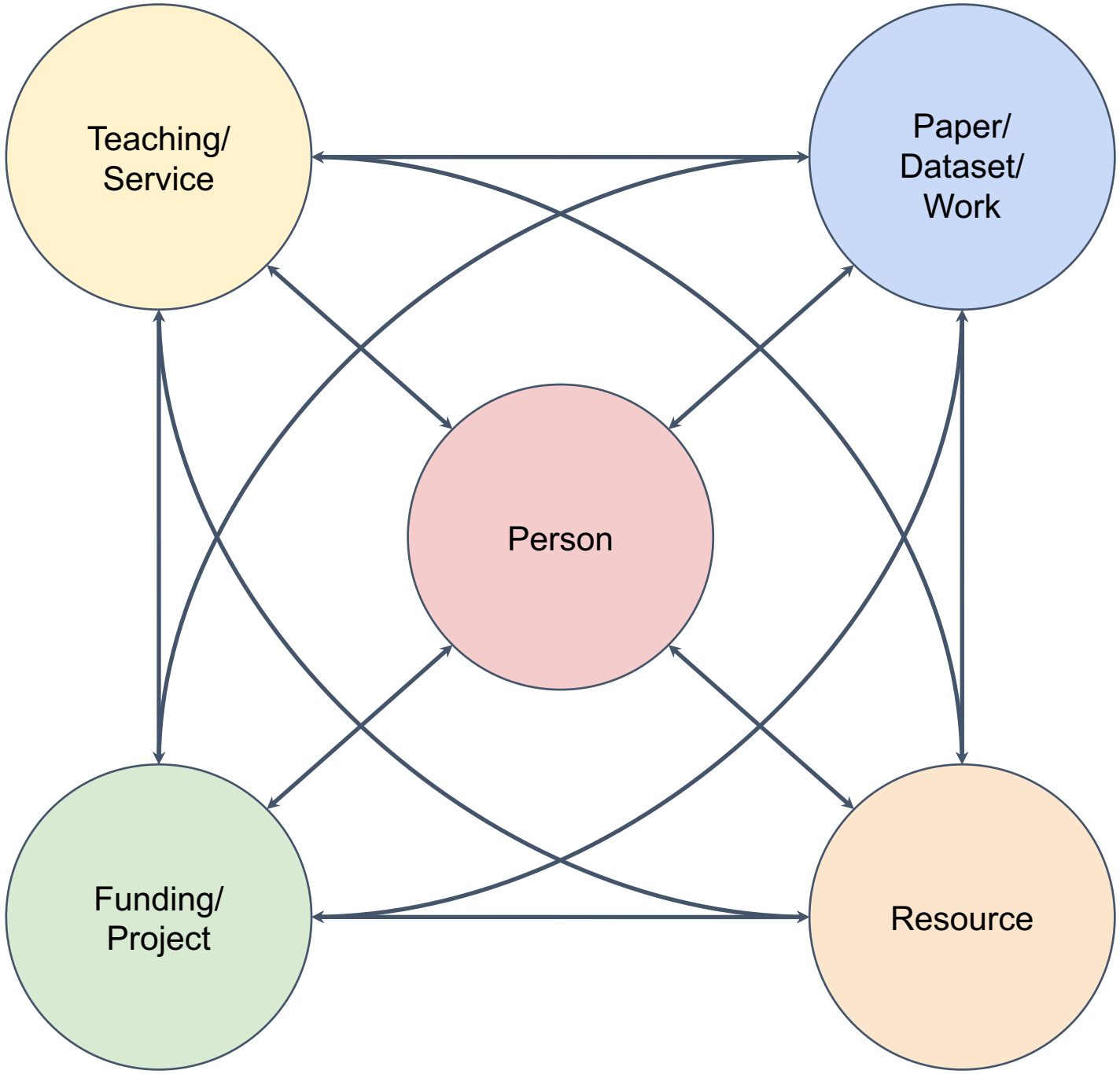
Linked Open Data for Scholarship: The VIVO Experience

Michael Conlon, PhD
VIVO Project Director
Emeritus Faculty Member
University of Florida


Concept
Dataset
Paper
Event
Project
Resource
Scientist
Funding
curates
authorOf
studies
keynoteSpeakerAt
teamMemberOf
uses
hasFunding



Person:Paper
authorOf, hasAuthor

Person:Grant
fundedBy, funds

Person:Resource
userOf, hasUser

Person:Data
creatorOf, hasCreator
curatorOf, hasCurator
userOf, hasUser

What is VIVO

- VIVO is an open source, semantic web application for representing, showcasing, and studying scholarship
- VIVO uses a collection of ontologies to represent scholarship
- VIVO produces linked data that is readily shared and recombined
- VIVO is member-supported project
- VIVO is in use at over 150 institutions in 27 countries, representing more than 200,000 scholars and 2 million works.

Joshua Sosin, Associate Professor of Classical Studies

Faculty in the News

- Scientists Map Sex Chromosome Evolution in Fungi
  AUG 11
- Pinpointing Where Durham's Nicotine Addicts Get Their Fix
  AUG 11
- With D-SIGN Grants, Graduate Students Build Networks and Advance Research Interests
  AUG 11
- Out-of-Pocket Costs Exceed What Many Insured Cancer Patients Expect to Pay
  AUG 11

see more at Duke Today

Research Events

Psychiatry Grand Rounds: "Learning Cognitive Control: Cognitive and Neural Mechanisms of Adapting Control to Changing Contexts"
AUG 17 | 12:00 PM

Evidence Implementation in Nursing Practice in China
AUG 24 | 12:00 PM

Read Updates From the Scholars Team >>

Explore

- Find People

Search GO

- Explore Duke Research
- Browse Duke Schools

Get Help

- New to Scholars?
- Support Page
- Video Tutorials

Update

- Edit My Profile
- Manage Scholars Data
- Learn How to Update

Research Hub

Search

Log In

Connect with Griffith Researchers

Know more. Do more.

Quantum computing expert is Young Tall Poppy

The revolutionary solutions offered by quantum computing are under the spotlight as Griffith's Dr Erik ... read more

Find a

Researcher | Keyword

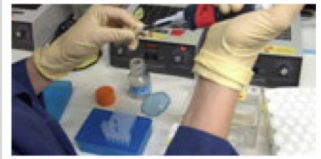
Name

Search

Welcome to Griffith University's Research Hub, a rich and informative guide to the University's expertise in a comprehensive array of academic fields.

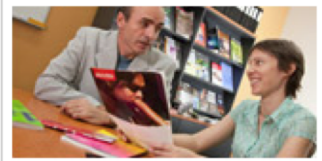
Find An Expert

Research Groups



Current Projects

Research Degrees

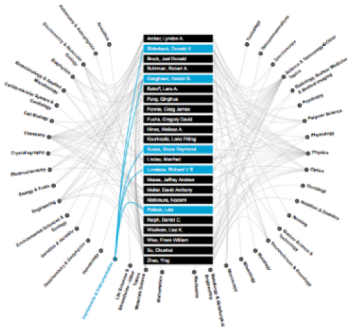


Find A Supervisor

Apply Now

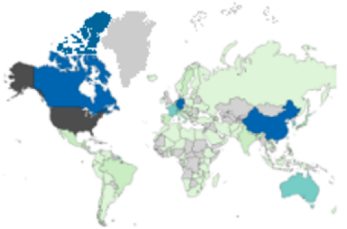
The Excellence in Research for Australia (ERA) 2012 results (based on the 2005-2010 period) profile Griffith as a comprehensive, research-active university with approximately 88% of eligible researchers associated with broad (two-digit) fields of research assessed at world standard or better.

The Visualizations

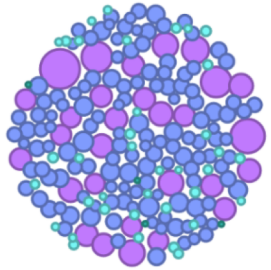


Research Interests

Keyword Clouds



Global Collaborations



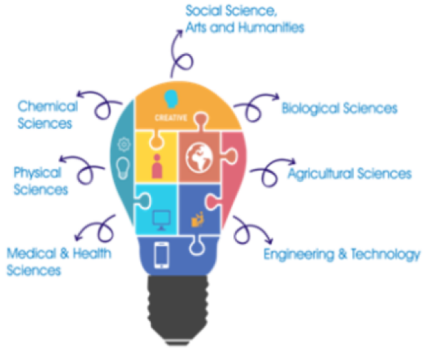
Grants and Contracts

VIDWAN
Expert Database & National Researcher's Network

An MHRD Project
National Mission on Education through ICT
(NME-ICT)

Data Collection Format | HOME | ABOUT US | DOWNLOAD | LOGIN | REGISTRATION | FEEDBACK

About Vidwan



Expert Database and National Researcher Network

VIDWAN is the premier database of profiles of scientists / researchers and other faculty members working at leading academic institutions and other R & D organisation involved in teaching and research in India. It provides important information about expert's background, contact address, experience, scholarly publications, skills and accomplishments, researcher identity, etc. The database developed and maintained by Information and Library Network Centre (INFLIBNET) with financial support from the National Mission on Education through ICT (NME-ICT). The

Subject Category

Agricultural Sciences	2681
Arts & Humanities	1440
Biological Sciences	1145
Chemical Sciences	1856
Engineering & Technology	6409
Medical & Health Sciences	3316
Physical Sciences	2970

Dr

Dawn Adams

GDipPsych, DPsychCl, PhD, BScHons

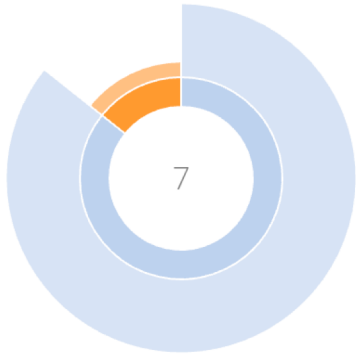
Clinical Psychologist and Researcher with expertise in Autism and Intellectual Disabilities

Affiliations

Arts, Education and Law

Griffith Institute for Educational Research

Contact this Academic



Publications by Fields of Research

Research Publications and Outputs

Recent Publications

Publications: 7 (Journal Articles (Refereed Article): 6, Book Chapter: 1)

Adams, D., & Oliver, C. (2016). The relationship between acquired impairments of executive function and behaviour change in adults with Down syndrome. *Journal of Intellectual Disability Research*, *54*(5), 393–405.

Adams, D., Handley, L., Heald, M., Simkiss, D., Jones, A., Walls, E., & Oliver, C. (2016). A Comparison of Two Methods for Recruiting Children with an Intellectual Disability. *Journal of Applied Research in Intellectual Disabilities*, 1–9.

Adams, D., Handley, L., Simkiss, D., Walls, E., Jones, A., Knapp, M., ... Oliver, C. (2016). Service use and access in young children with an intellectual disability or global developmental delay: Associations with challenging behaviour. *Journal of Intellectual & Developmental Disability*, 1–10.

Adams, D., Horsler, K., Mount, R., & Oliver, C. (2015). Brief Report: A Longitudinal Study of Excessive Smiling and Laughing in Children with Angelman Syndrome. *Journal of Autism and Developmental Disorders*, *45*(8), 2624–2627.

Oliver, C., Adams, D., Allen, D., Bull, L., Heald, M., Moss, J., ... Woodcock, K. (2013). Causal models of clinically significant behaviors in Angelman, Cornelia de Lange, Prader-Willi and Smith-Magenis syndromes. In *International Review of Research in Developmental disabilities: Challenging Behavior* (pp. 167–212).

Show More...

Funded Griffith Research

(2017). Reducing the impact of anxiety on learning and behaviour of anxious students with autism in the classroom

Learning and Teaching

Conlon, Mike | VIVO Project Director

Contact Info

mconlon@ufl.edu

(352) 214-7882

Websites

- OpenVIVO Profile
- Google Scholar profile
- Twitter
- VIVO Home Page
- Clinical and Translational Science Institute

Positions

- Emeritus Faculty, Clinical and Translational Science Institute , College of Medicine 2015 -
- Project Director, VIVO Project , Duraspace 2015 - 2018
- Faculty, Clinical and Translational Science Institute , College of Medicine 2009 - 2015
- Co-director, Clinical and Translational Science Institute , College of Medicine 2013 - 2015
- Director, Biomedical Informatics , CTSI Transformational Programs 2009 - 2014
- Associate Director and Chief Operating Officer, Clinical and Translational Science Institute , College of Medicine 2010 - 2013
- Director of Data Infrastructure, Information Technology , Office of the Vice President and Chief Information Officer 2002 - 2010
- Interim Director, Clinical and Translational Research Informatics Program 2008 - 2010

Publications in VIVO

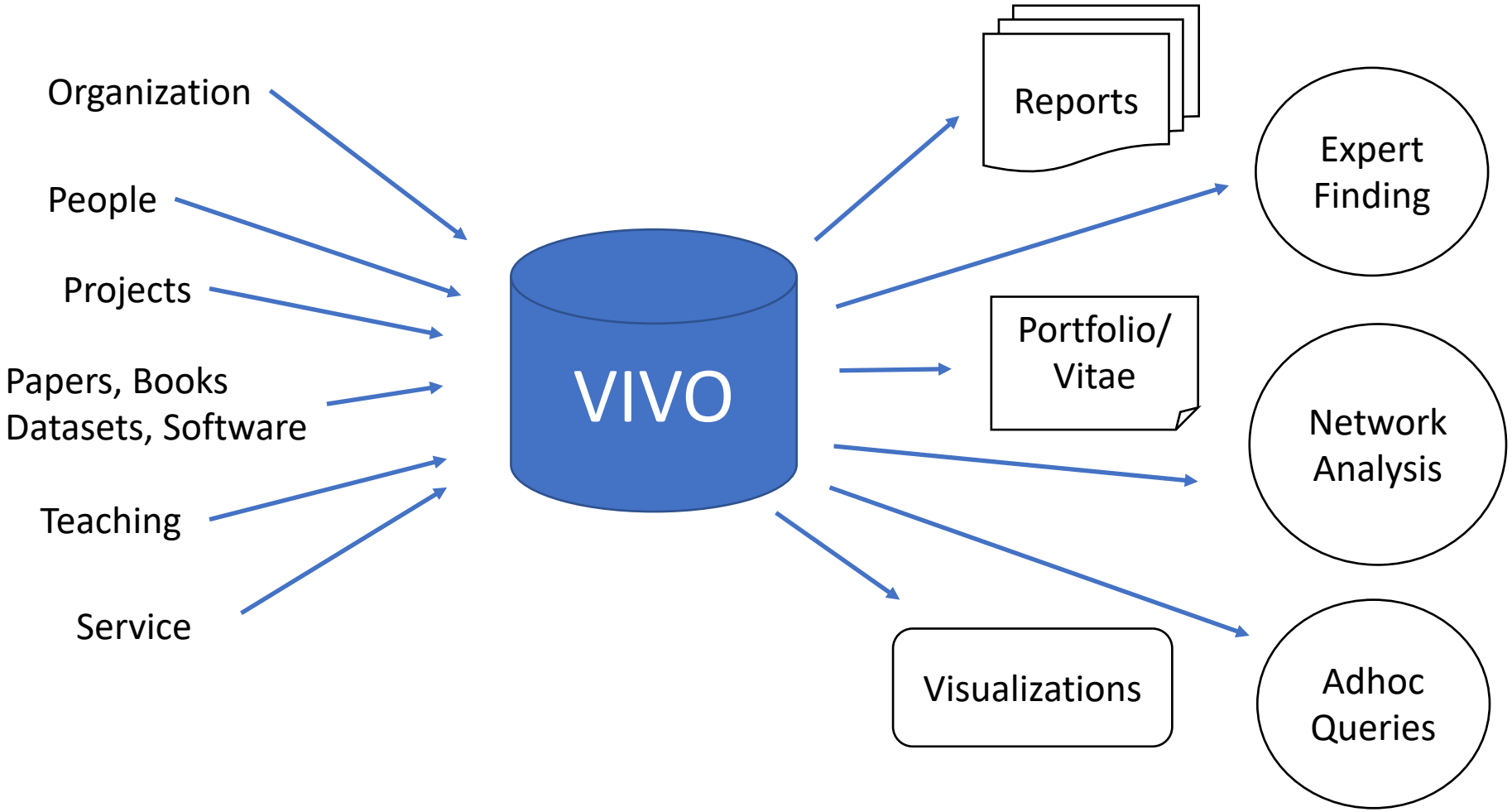
63 in the last 10 full years

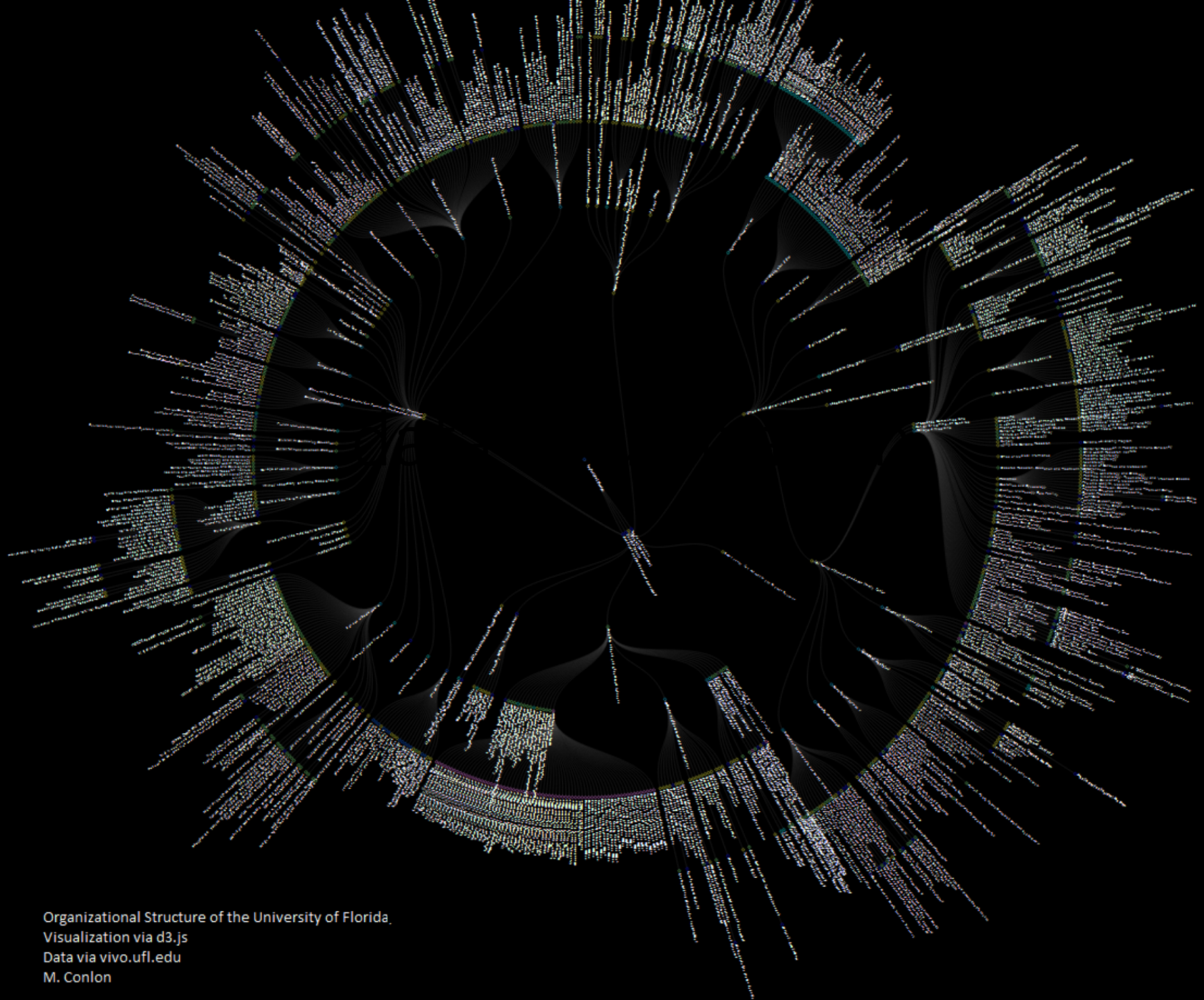
Co-author Network

Map of Science

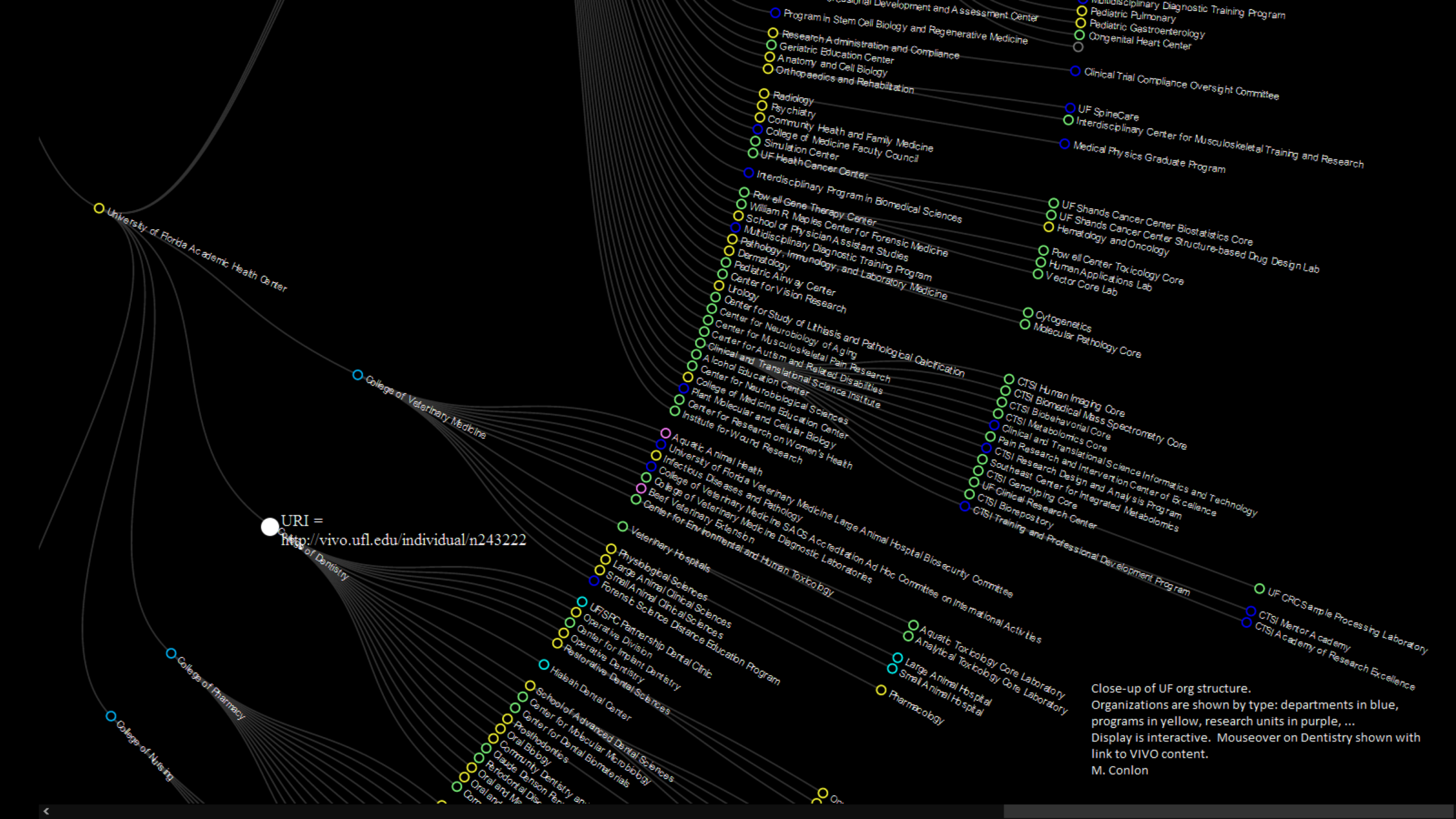
Co-investigator Network

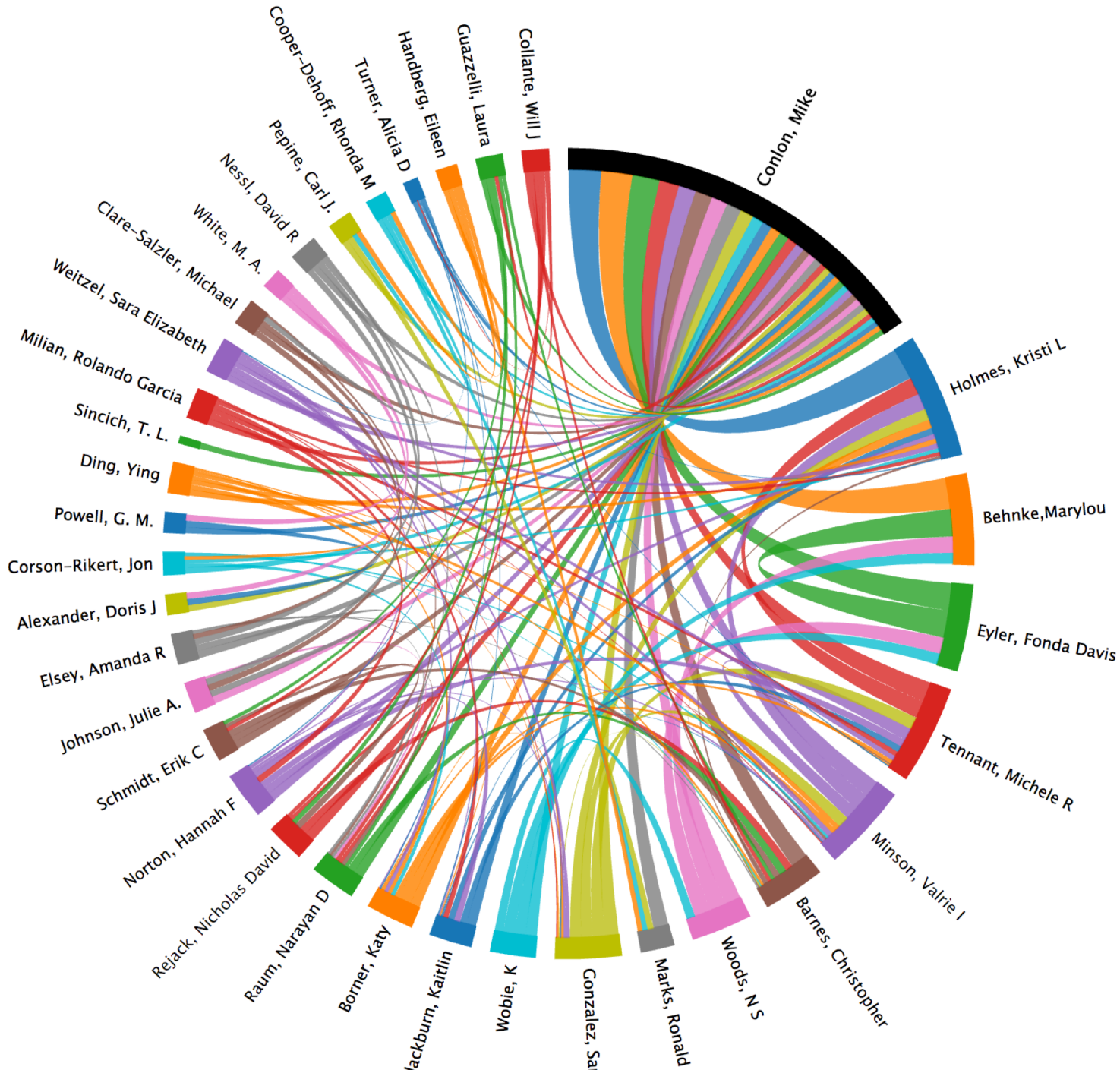
VIVO integrates and reuses institutional data





Organizational Structure of the University of Florida
Visualization via d3.js
Data via vivo.ufl.edu
M. Conlon

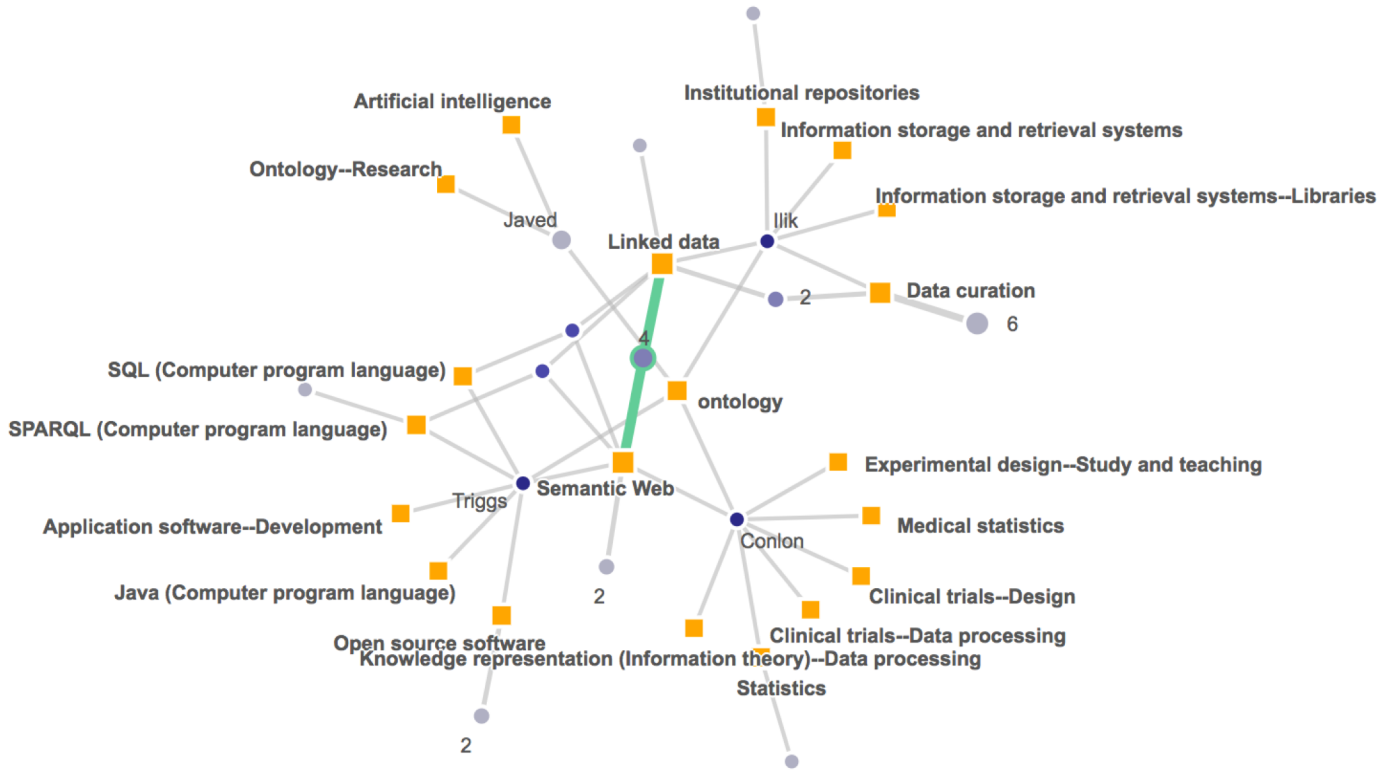

Program in Stem Cell Biology and Regenerative Medicine
Research Administration and Compliance
Geriatric Education Center
Anatomy and Cell Biology
Orthopaedics and Rehabilitation
Radiology
Psychiatry
Community Health and Family Medicine
College of Medicine Faculty Council
Simulation Center
UF Health Cancer Center
Interdisciplinary Program in Biomedical Sciences
Powell Gene Therapy Center
William R. Maples Center for Forensic Medicine
School of Physician Assistant Studies
Multidisciplinary Diagnostic Training Program
Pathology, Immunology, and Laboratory Medicine
Dermatology
Pediatric Airway Center
Center for Vision Research
Urology
Center for Study of Lithiasis and Pathological Calcification
Center for Neurobiology of Aging
Center for Musculoskeletal Pain Research
Center for Autism and Related Disabilities
Clinical and Translational Science Institute
Alcohol Education Center
Center for Neurobiological Sciences
College of Medicine Education Center
Plant Molecular and Cellular Biology
Center for Research on Women's Health
Institute for Wound Research
Aquatic Animal Health
University of Florida Veterinary Medicine Large Animal Hospital Biosecurity Committee
Infectious Diseases and Pathology
College of Veterinary Medicine SACS Accreditation Ad Hoc Committee on International Activities
College of Veterinary Medicine Diagnostic Laboratories
Beef Veterinary Extension
Center for Environmental and Human Toxicology
Veterinary Hospitals
Physiological Sciences
Large Animal Clinical Sciences
Small Animal Clinical Sciences
Forensic Science Distance Education Program
UF/SFC Partnership Dental Clinic
Operative Division
Center for Implant Dentistry
Operative Dentistry
Restorative Dental Sciences
Hialeah Dental Center
School of Advanced Dental Sciences
Center for Molecular Microbiology
Center for Dental Biomaterials
Prosthodontics
Oral Biology
Community Dentistry
Aquatic Toxicology Core Laboratory
Analytical Toxicology Core Laboratory
Large Animal Hospital
Small Animal Hospital
Pharmacology
CTSI Human Imaging Core
CTSI Biomedical Mass Spectrometry Core
CTSI Biobehavorial Core
CTSI Metabolomics Core
Clinical and Translational Science Informatics and Technology
Pain Research and Intervention Center of Excellence
Pain Research Design and Analysis Program
CTSI Research Design and Analysis Program
Southeast Center for Integrated Metabolomics
CTSI Genotyping Core
UF Clinical Research Center
CTSI Biorepository
CTSI Training and Professional Development Program
UF CRCSample Processing Laboratory
CTSI Mentor Academy
CTSI Academy of Research Excellence
Cytogenetics
Molecular Pathology Core
UF Shands Cancer Center Biostatistics Core
UF Shands Cancer Center Structure-based Drug Design Lab
Hematology and Oncology
Powell Center Toxicology Core
Human Applications Lab
Vector Core Lab
Clinical Trial Compliance Oversight Committee
UF SpineCare
Interdisciplinary Center for Musculoskeletal Training and Research
Medical Physics Graduate Program
Multidisciplinary Diagnostic Training Program
Pediatric Pulmonary
Pediatric Gastroenterology
Congenital Heart Center
Professional Development and Assessment Center
University of Florida Academic Health Center
College of Veterinary Medicine
College of Dentistry
College of Pharmacy
College of Nursing
URI =
http://vivo.ufl.edu/individual/n243222
Close-up of UF org structure.
Organizations are shown by type: departments in blue, programs in yellow, research units in purple, ...
Display is interactive. Mouseover on Dentistry shown with link to VIVO content.
M. Conlon


Collante, Will J
Guazzelli, Laura
Handberg, Eileen
Turner, Alicia D
Cooper-Dehoff, Rhonda M
Pepine, Carl J.
Nessl, David R
White, M. A.
Clare-Salzler, Michael
Weitzel, Sara Elizabeth
Milian, Rolando Garcia
Sincich, T. L.
Ding, Ying
Powell, G. M.
Corson-Rikert, Jon
Alexander, Doris J
Elsey, Amanda R
Johnson, Julie A.
Schmidt, Erik C
Norton, Hannah F
Rejack, Nicholas David
Raum, Narayan D
Borner, Katy
Blackburn, Kaitlin
Wobie, K
Gonzalez, Sa
Marks, Ronald
Woods, N S
Barnes, Christopher
Minson, Valrie I
Tennant, Michele R
Eyler, Fonda Davis
Behnke,Marylou
Holmes, Kristi L
Conlon, Mike

openvivo.org/vis/capabilitymap#ontology%7C10%7C1

ontology | Cutoff: 10 | Search | Search and Expand | Reset

pause | hide group labels



Search terms | Info

Group: Semantic Web, Linked data

Remove group

- University of Colorado Boulder: 1
- Thomson Reuters (United States): 1
- Northwestern University: 1
- VU University Amsterdam: 1

Thea Lindquist, [X]

University of Colorado Boulder

Ted Lawless, [X]

Thomson Reuters (United States)

Kristi Holmes, [X]

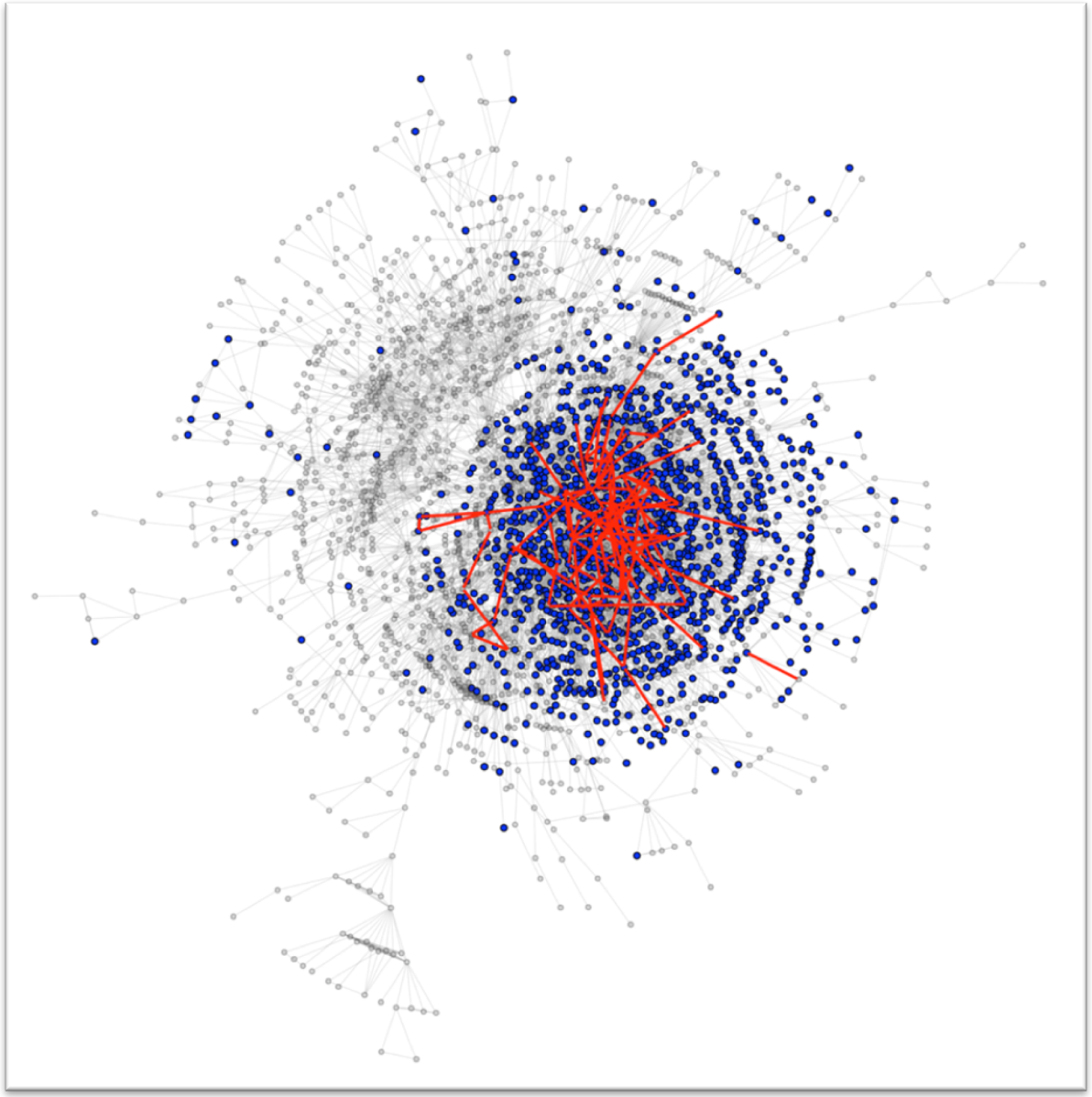
Northwestern University

Tobias Kuhn, [X]

VU University Amsterdam

Impact of Pilot Funding on University Social Network

Chris McCarty, Raffaele Vacca



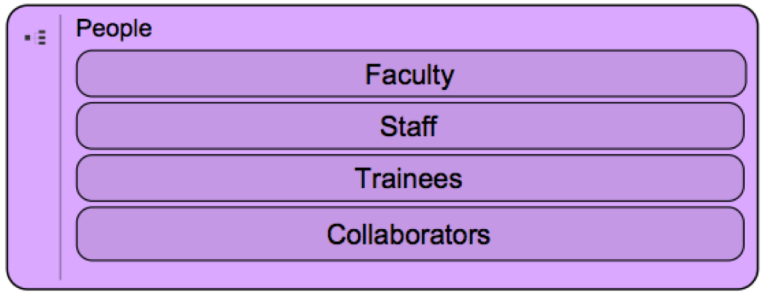
Co-author network of the University of Florida, 2013. Health Center Faculty in blue. Pilot awardees and new connections in red.

Domains of Representation

The activities and accomplishments of your people

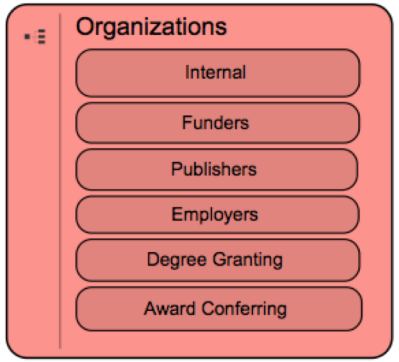
- Positions
- Educational Background
- Grants
- Courses
- Mentoring
- Awards and Honors
- Publications, Presentations, Books, Datasets
- Service

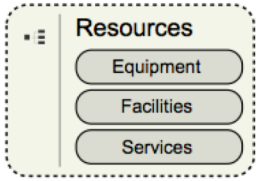
The people in your VIVO -- your faculty, staff and trainees, and their collaborators at other organizations

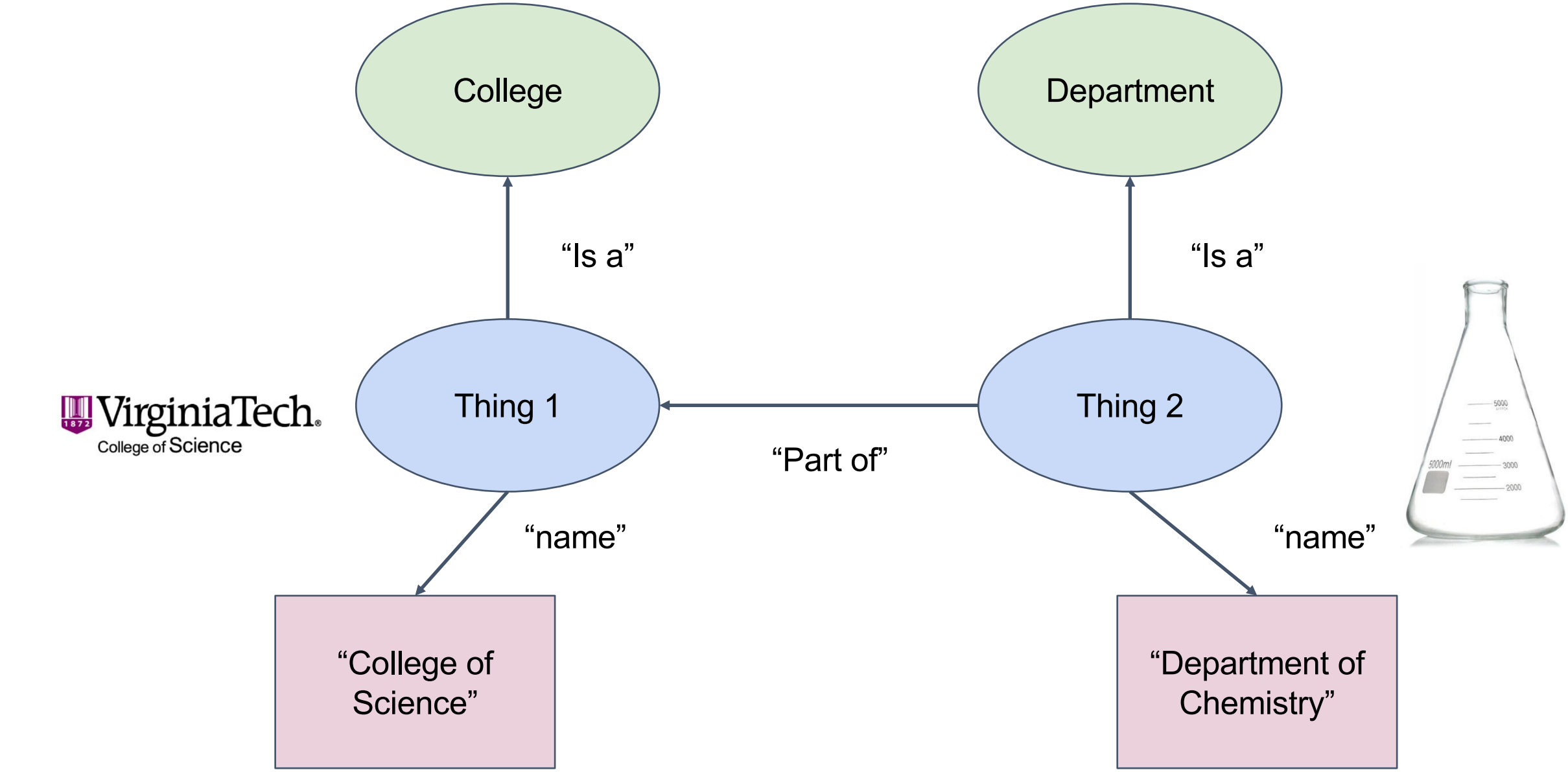


Entities referred to in your scholarly work. Your internal organization, organizations related to the scholarly work of your people

- Dates
- Locations
- Journals

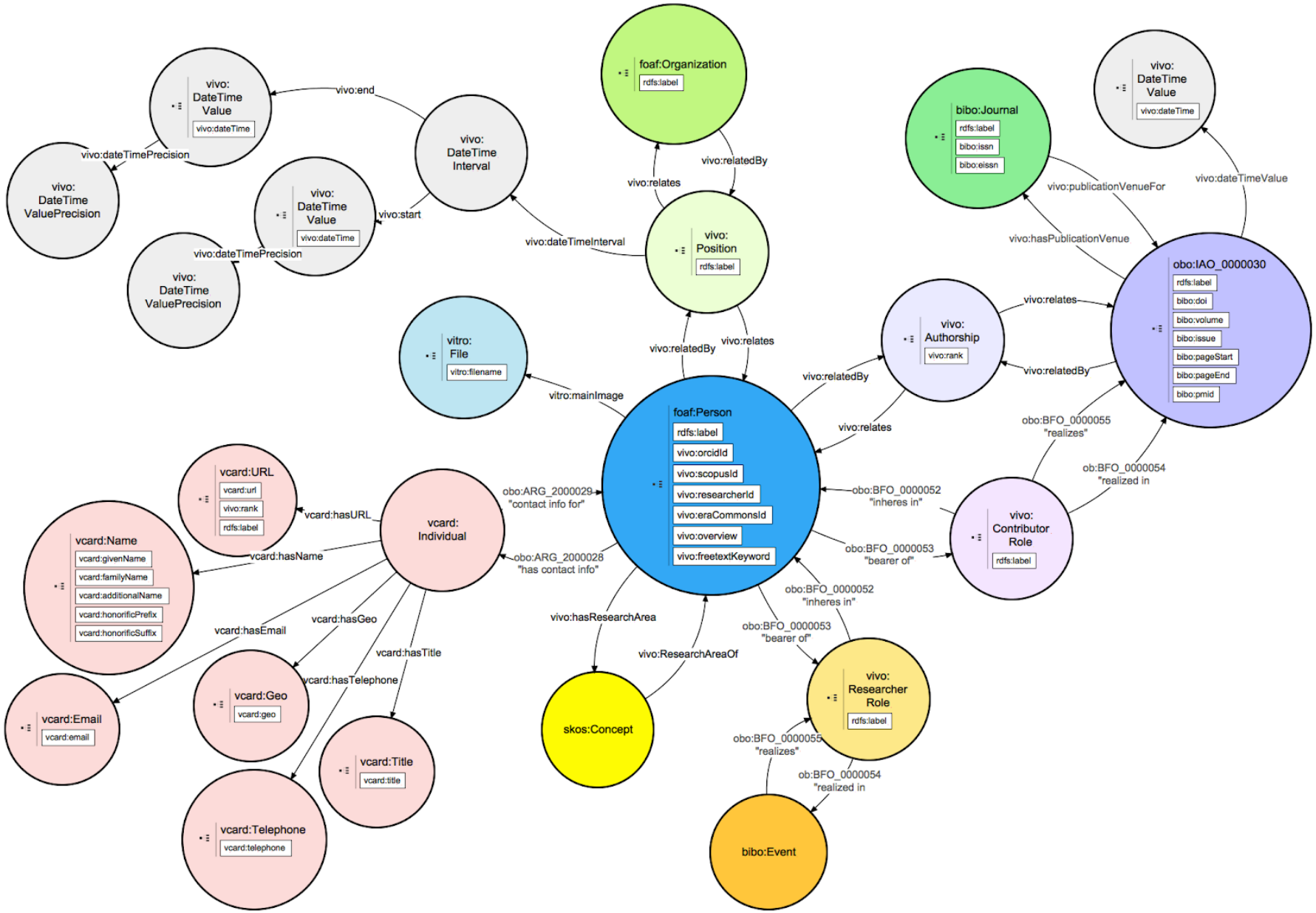






VirginiaTech
College of Science

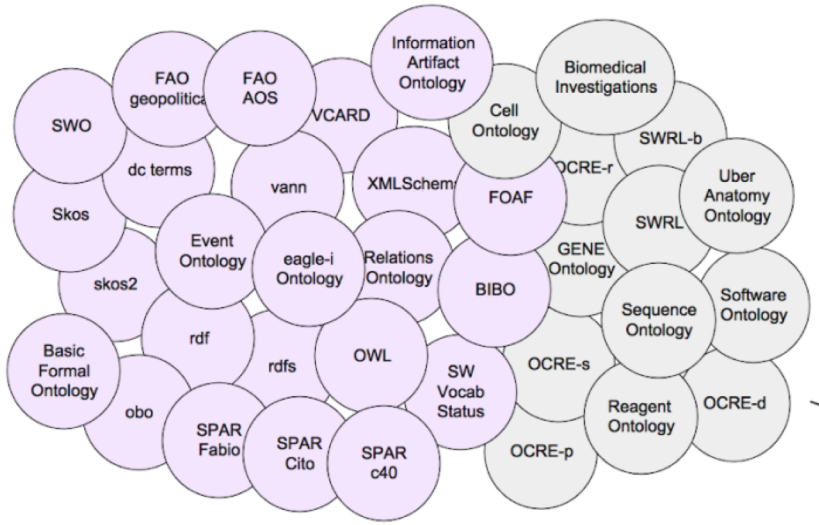
Person Model



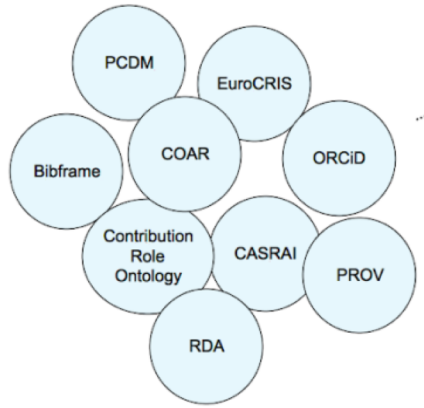
VIVO Integrated Semantic Framework (VIVO-ISF) integrates ontologies. A subset of VIVO-ISF is used by VIVO. Other projects use VIVO-ISF. Other ontologies could be integrated with VIVO-ISF.

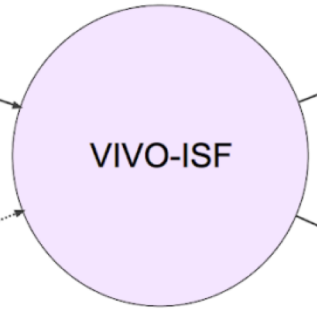
Ontologies integrated in the VIVO-ISF.

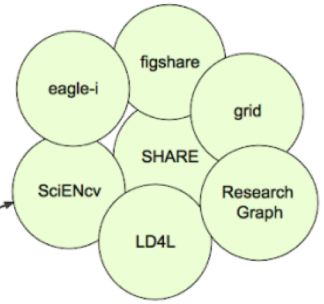
Ontologies in grey appear to be unused in VIVO



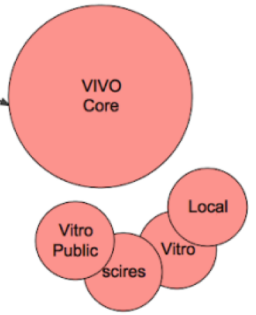
Ontologies and related projects that could be integrated with VIVO-ISF







Projects mapped to VIVO-ISF



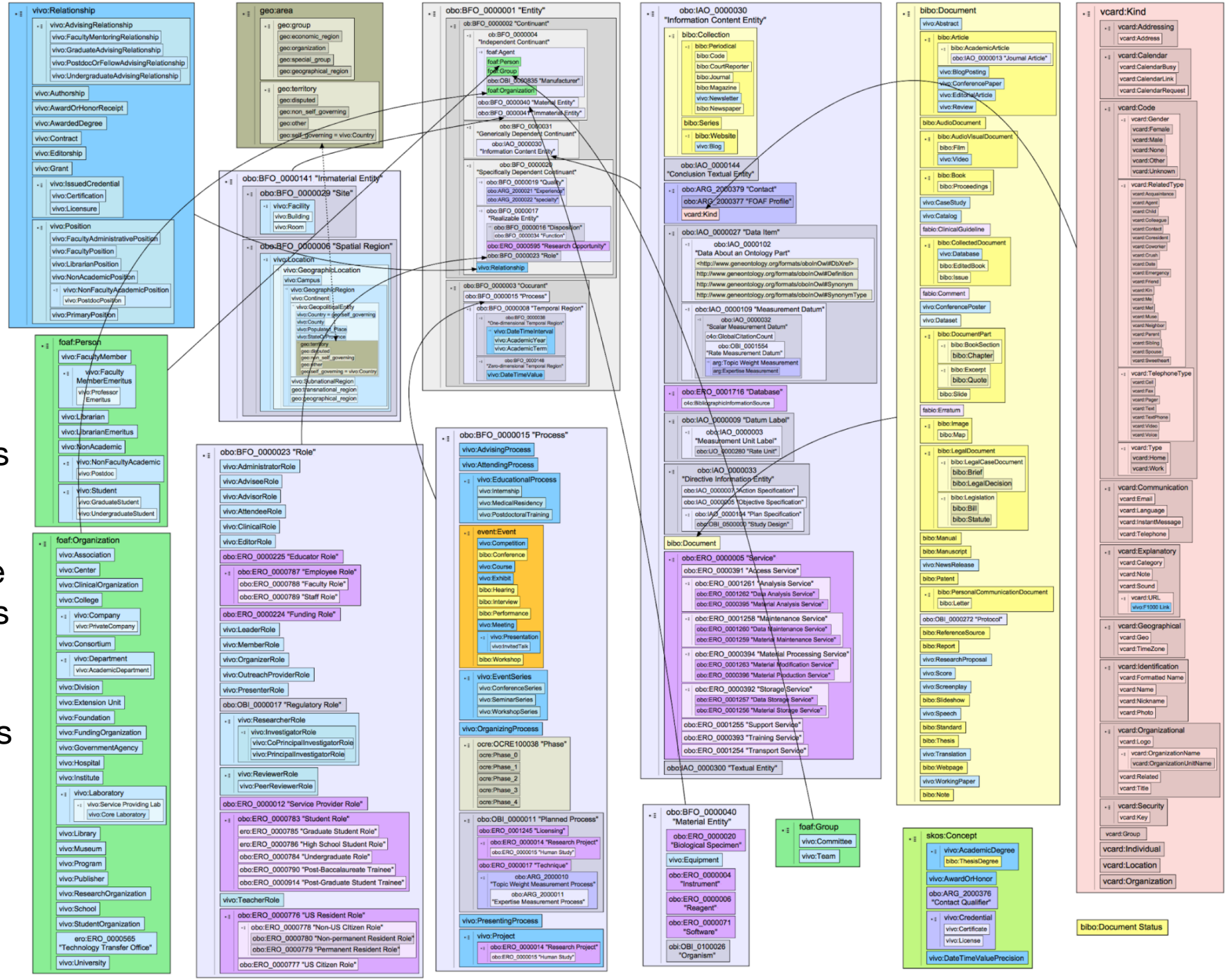
The VIVO Core ontology used by VIVO is a subset of VIVO-ISF. It is suplemented with Vitro, Local and SciRes ontologies.

418 Classes

199 Object Properties

219 Datatype Properties

14 Individuals



Issue: The Middle Ground

Above VIVO (more abstract) is the Basic Formal Ontology

Below VIVO (more specific) are domain specific ontologies and vocabularies (clinical trials, agriculture, humanities, cultural heritage, …)

Most ontologies “below” VIVO introduce their own “middle concepts” — person, paper, project — these must be “reconciled” with VIVO. This is fundamental collaborative work across projects

Issue: Missing Ontologies

To represent scholarship, VIVO must represent detail that is best defined by authoritative sources

Example: Academic Degrees

- VIVO supports its own vocabulary of 173 academic degrees (because the world doesn't have one)

Example: Research Areas

- Many vocabularies exist for expressing research areas of faculty members. What might be "useful" for faculty to find people working in related areas? OpenVIVO uses FAST (Faceted Application of Subject Terminology) from OCLC (Online Computer Library Center).

Example: Contribution Ontology

- The contribution ontology developed by the Force16 Attribution Work Group, VIVO Project, and OpenRIF is new. It will need to be refined based on experience and further analysis

Issue: Managing Ontological Change

Many institutions and projects use VIVO (150) and the VIVO-ISF ontology (another 250)

VIVO needs a process for updating ontologies it uses, and updating its data and interfaces to use updated ontologies

But many sites depend on the ontology to retrieve data from VIVO and other systems to web sites, software, and reports

What changes have minimal to no impact? Which do not? How to propose change? Govern change? Implement change?

Systems producing VIVO Data for Scholarship

- VIVO sites, including OpenVIVO, Cambridge, Duke, Cornell, IICA, InflibNet, APA, TIB Hannover, and 150 others in 27 countries
- Tools for SCOPUS, Web of Science, Dimensions, Pubmed, ORCiD, ResearchGraph, figshare, GRiD
- Harvard Profiles, Elsevier PURE, Symplectic Elements
- Local systems producing VIVO data from other systems

Tools for producing VIVO Data for Scholarship

- Karma
- The VIVO Pump
- The VIVO Harvester
- Many other local, open source tools

CTSAsearch Home
CTSA Search
CTSA Community Map
CTSA Institution Map
Participation Details

Custom Maps
Chicago Women in STEM Map

Comparison Approaches
Google Search
Federated Search

Search for Investigators at Multiple Institutions

- ○ Text only
- ○ Text and UMLS concepts
- ◉ UMLS concepts (including support for boolean search using &, |, and !)

pulmonary hypertension [Search]

UMLS concepts recognized in your query:

- C0020542 - pulmonary hypertension
- C1963220 - pulmonary hypertension

Map view of this query

Search Results: pulmonary hypertension

Result Count: 1000

Person	Title	Email Address	Phone Number	Score
Victor Tapson	Professor of Medicine	tapso001@mc.duke.edu		25.24

Linked Data Fragments Server

Core

Query core by triple pattern

subject:

predicate:

object:

Find matching triples

Matches in core for *{ ?s ?p ?o }*

Showing triples 1 to 100 of ± 5,116,117 with 100 triples per page. **next**

```
grid.411827.9-vcard-address   22-rdf-syntax-ns#type   ns#Explanatory .
grid.411827.9-vcard-address   22-rdf-syntax-ns#type   ns#Addressing .
grid.411827.9-vcard-address   22-rdf-syntax-ns#type   owl#Thing .
grid.411827.9-vcard-address   22-rdf-syntax-ns#type   ns#Communication .
grid.411827.9-vcard-address   22-rdf-syntax-ns#type   ns#Address .
grid.411827.9-vcard-address   22-rdf-syntax-ns#type   ns#Identification .
grid.411827.9-vcard-address   ns#locality   "Tokyo".
grid.411827.9-vcard-address   0.7#mostSpecificType   ns#Address .
grid.411827.9-vcard-address   ns#country-name   "Japan".
grid.418502.a-vcard-link1   ns#url   "http://www.cfri.ca/"^^http://www.w3.org/2001/XMLSchema…
grid.418502.a-vcard-link1   22-rdf-syntax-ns#type   ns#Addressing .
grid.418502.a-vcard-link1   22-rdf-syntax-ns#type   ns#URL .
grid.418502.a-vcard-link1   core#rank   "1"^^http://www.w3.org/2001/XMLSchema#integer.
grid.418502.a-vcard-link1   0.7#mostSpecificType   ns#URL .
grid.418502.a-vcard-link1   22-rdf-syntax-ns#type   ns#Identification .
grid.418502.a-vcard-link1   22-rdf-syntax-ns#type   ns#Explanatory .
grid.418502.a-vcard-link1   22-rdf-syntax-ns#type   core#HomePageURL .
grid.418502.a-vcard-link1   22-rdf-syntax-ns#type   owl#Thing .
grid.418502.a-vcard-link1   0.7#mostSpecificType   core#HomePageURL .
```

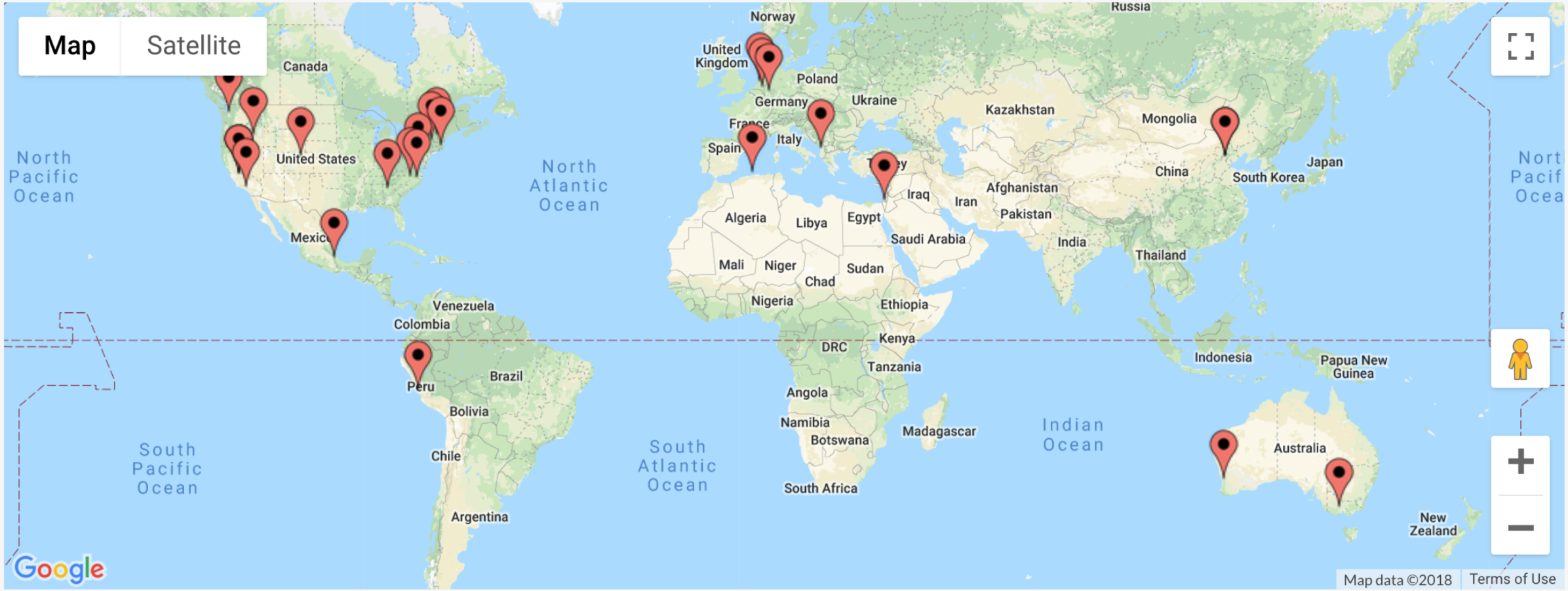
VIVO Data Issues

Semantic web approach is new for many universities

Locating, identifying, and disambiguating researchers and their works can be difficult

Shortcomings in the data may lead to unwillingness to make data available

Only sites displayed on the current page of search results are included on the map. Sites with the same location information may overlap.



Displaying 1 - 25 of 159

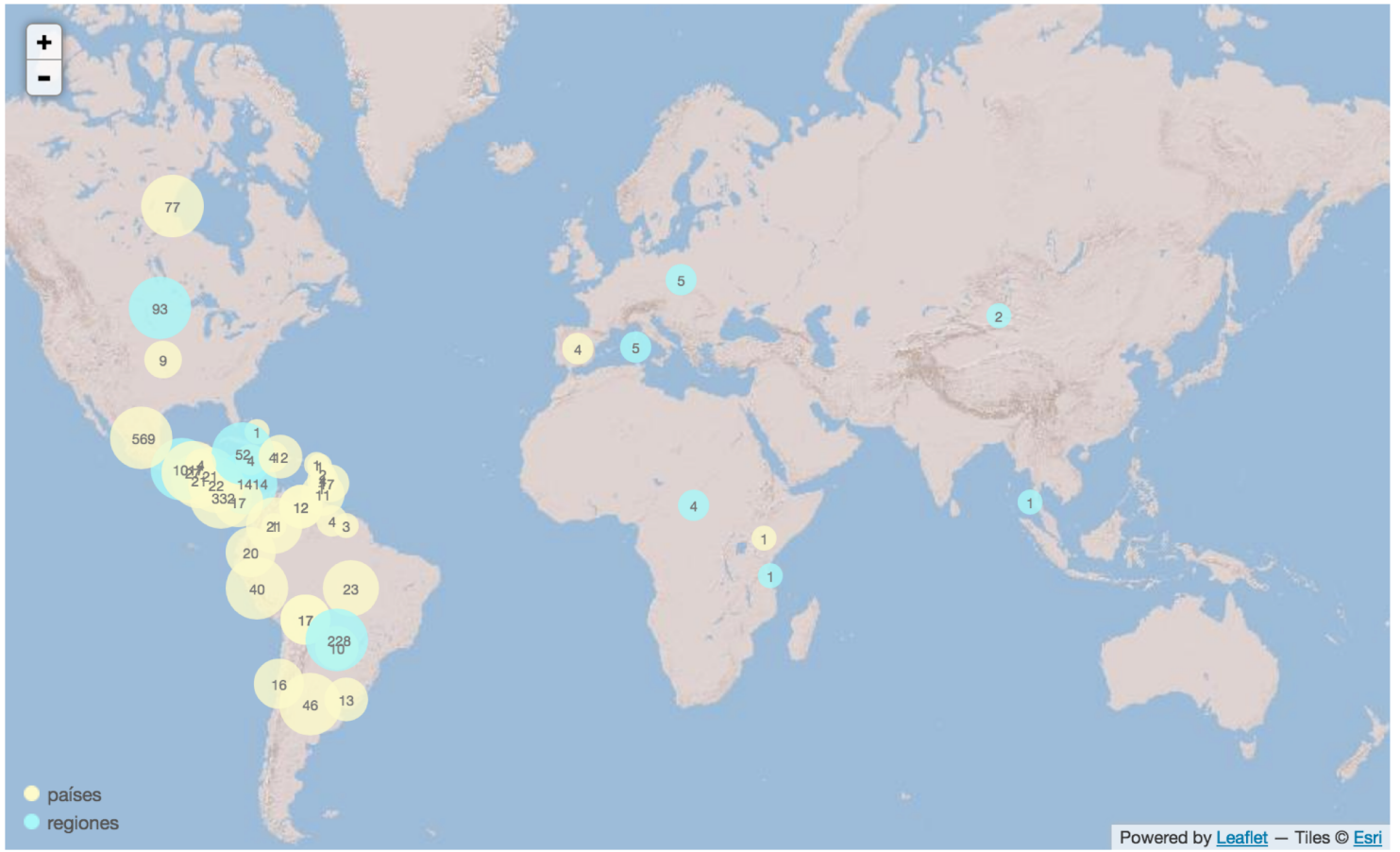
http://duraspace.org/registry/vivo

1 2 3 ... 7 »

Organization Name	Site Name	Site URL	Type of Organization	Country	Technology	Version
Albanian Institute of Science	Academic'al Researcher's Network	academical.al	research center	Albania	VIVO	1.7.x

Inter-American Institute for Cooperation on Agriculture

1484 investigadores en 50 países y regiones.



Estadística

2,1 k	4	367	1,8 k	2,1 k	449
Personas	Actividades	Eventos	Organizaciones	Investigación	Localizaciones

Current VIVO Projects

- Internationalization – German, Spanish, Mandarin, French, English
- Product Evolution – new presentation layer
- Combine – collect and disambiguate world and local data for VIVO
- VIVO and Blockchain – using an open blockchain to store VIVO assertions
- RIALTO – Stanford University research information
- Deff Opera – research analytics
- Research Graph – data augmentation
- Research Management Information ontology for VIVO
- CERIF to VIVO – convert CRIS data to VIVO
- CD2H – expand person roles in scholarship
- Metabolomics – domain coordinating center and repository
- Ontology Improvement – clean-up, identifiers, languages, humanities

VIVO Member Organizations

Getting Started

- VIVO GitHub https://github.com/vivo-project
- vivo-community@googlegroups.com
- VIVO Conference http://vivoconference.org, Podgorica, Montenegro, September 4-6, 2019