

# Ontology for Scholarship: Revising the VIVO Ontology

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VIVO

# Why? What? How?

## Why

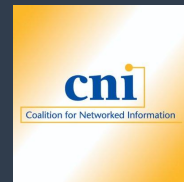
- Improve representation of scholarship -- breadth, depth, consistency
- Address technical debt, licensing, methodology, use of other ontologies

## What

- A new ontology, with related ontology modules, based on community standards
- Tools, documents, and training to work with the new ontologies.

## How

- Open, multi-year effort to develop, test, and implement the new ontologies in the VIVO software, upgrade existing data, document, and train

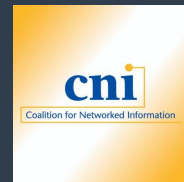


# Why now?

Decoupling the architecture is one of the VIVO goals

A full scale version upgrade to the ontology can be planned years in advance to include all the change management required.

Best practices can be implemented to significantly improve the ontology and its related modules.



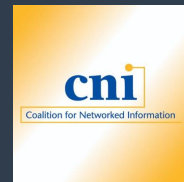
# Adopting BFO and the OBO Foundry

The Basic Formal Ontology (BFO) is a small, upper level ontology that is designed for use in supporting information retrieval, analysis and integration in scientific and other domains.

VIVO mostly adopted BFO in 2012 and is listed as an ontology using BFO. Work remains on the subsumption hierarchy to fully adopt BFO.

The VIVO Ontology is listed in the Open Biomedical Ontology (OBO) Foundry, but does not comply with OBO standards, most notably full adoption of numbered class names.

VIVO uses the Ontology Development Kit and the OBO robot tool that provides templating, reasoning, SPARQL, term extraction, and other functions helpful in building consistent ontologies at scale.



# Current relation to other ontologies

1. Ontologies are based on different upper ontologies, introducing inconsistencies
2. Ontologies are often not well-maintained
3. Licenses for other ontologies may not be clear, or may restrict some use

# Ontologies used, referenced, modules

## Version 1

### Used

bfo, ro, iao, ero, skos, bibo,  
vcard, event, vitro, geo, ocre,  
ocresd, ocres, ocrep, fabio,  
c4o, cito, DC terms, vann,  
vocab, swo, vivo-sr

### Referenced

None

### Modules

local

## Version 2

### Used

bfo, ro, iao, ero, obi, time,  
skos, fast, gaz

### Referenced

cro, swo, bibo, vivo 1, cito

### Modules

local, org, lang, ado, journal,  
aeon, rao



# Languages

## Version 1

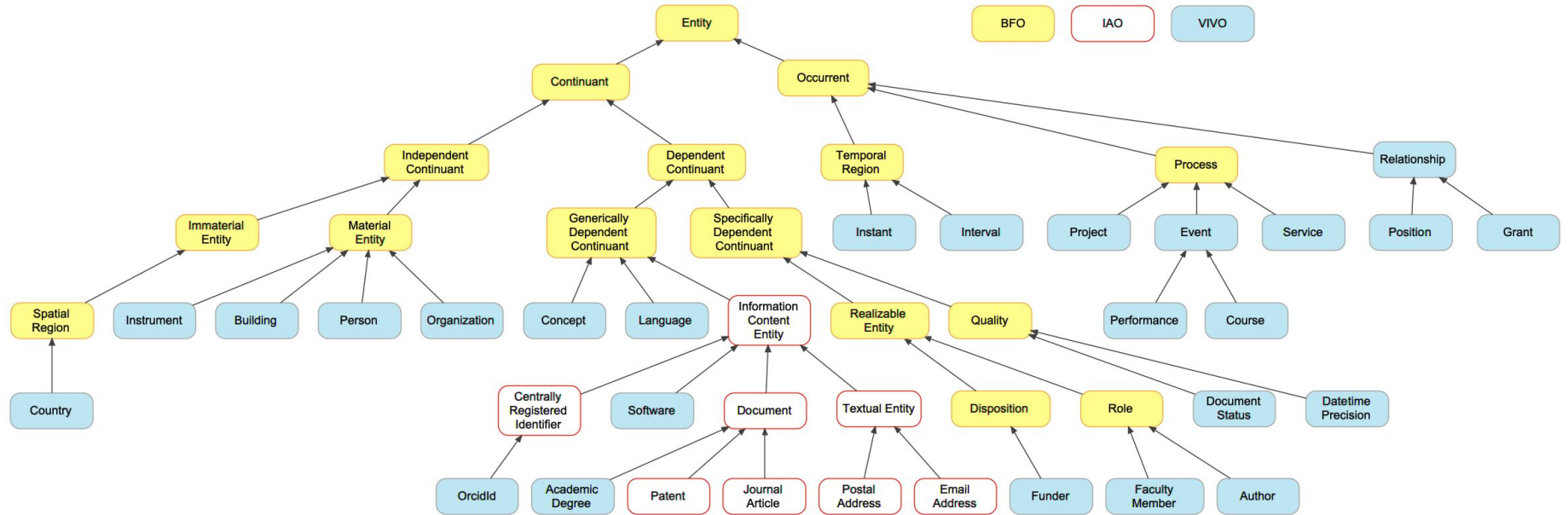
- No ability to represent languages

## Version 2

- LANG ontology based on ISO 639-3 and CEFR
- Ability to represent language capabilities of people and organizations
- Ability to represent translations
- Ability to represent languages of works
- See <http://github.com/vivo-community/language-ontology>



# Subsumption Hierarchy





# Additional areas of representation

- Teaching
- Research Impact
- Data and software
- Attribution
- Peer review and other services to the profession
- Services beyond those to the profession
- Learning objects
- Corporate research
- Grey literature
- Social media
- Collection and curation
- Non-academic expertise
- National modules



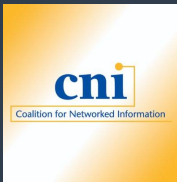
# Work to date

- VIVO Ontology Version 2 white paper
- Early Thoughts on Ontologies used in VIVO
- Early Thoughts on Open Ontology Issues and Version 2
- Early Thoughts on Related Domains
- Early Thoughts on Representing Academic Degrees in VIVO
- Early Thoughts on Representing Grants and Projects in VIVO
- Early Thoughts on Representing Identifiers in VIVO
- Early Thoughts on Representing Language Capabilities in VIVO
- Early Thoughts on Representing Organizations in VIVO
- Early Thoughts on Representing People in VIVO
- Early Thoughts on Representing Roles and Relationships in VIVO
- Early Thoughts on Representing Scholarly Works and Activities in VIVO
- Early Thoughts on VIVO Subsumption Hierarchy
- VIVO Community Ontology Development Repository



# More information

- The VIVO Ontology Interest Group meets regularly to discuss the development of ontology for VIVO. See <https://wiki.lyrasis.org/display/VIVO/Ontology+Interest+Group>
- The current VIVO ontology can be found here: <http://bit.ly/2V5uSDq>



**Thank you**

Michael Conlon, University of Florida and  
Violeta Ilik, Columbia University  
on behalf of the VIVO Ontology Interest Group



VIVO