



Finding a Good Ontology: The Open Ontology Repository Initiative

Ken Baclawski, kenb@ccs.neu.edu
Mike Dean, mdean@bbn.com
Todd Schneider, todd.schneider@raytheon.com
Peter Yim, peter.yim@cim3.com

Semantic Technology Conference
San Francisco, California
24 June 2010

These slides: http://ontolog.cim3.net/file/work/OOR/OOR_presentations_publications/OOR-SemTech_Jun2010.pdf

Outline

- Introduction
- Demonstration
- Requirements and Challenges
- Current Efforts
- How to Participate



Open Ontology Repository



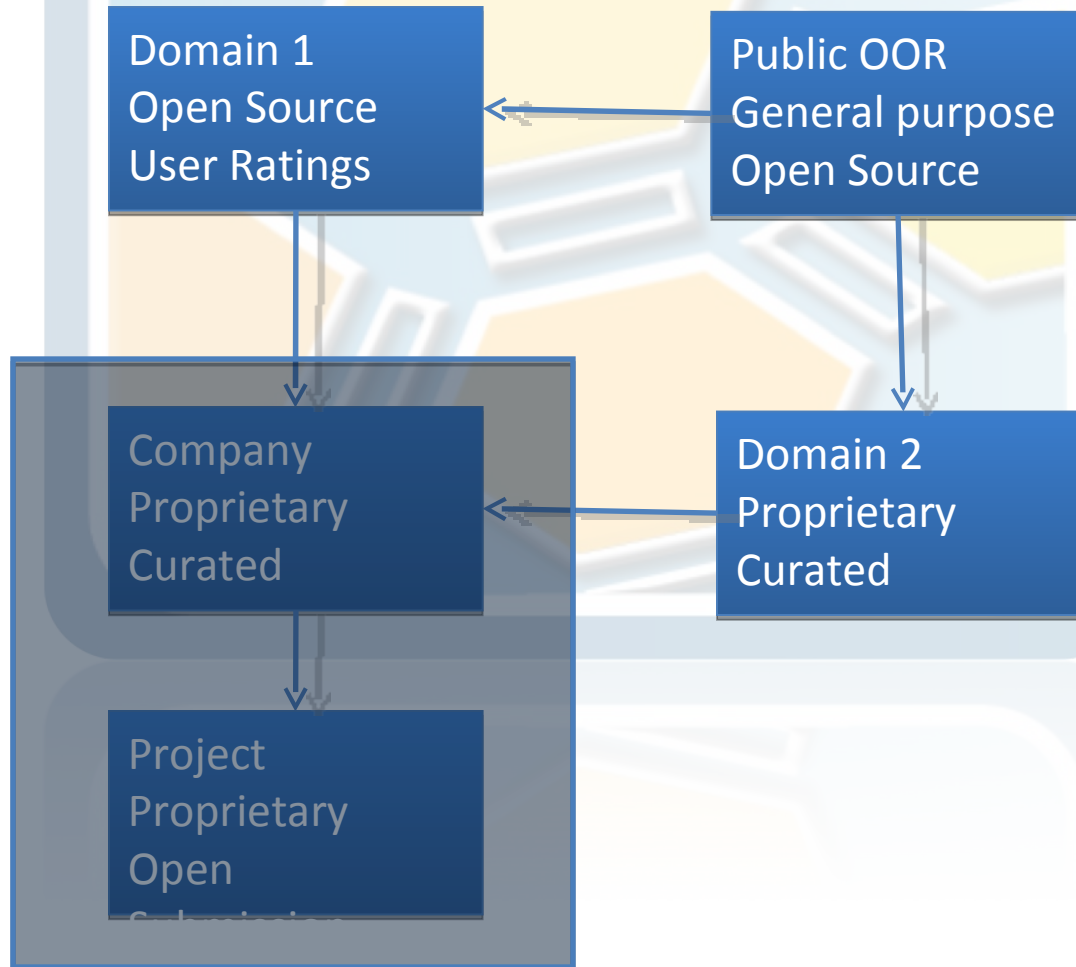
- Community effort since January 2008
- Promote global use and sharing of ontologies
 - Modular open source registry/repository software
 - 1 or more public instances
 - Best practices for ontology sharing and management

OOR Software Target



- Allow modular choices among
 - Registry functions (search, etc.)
 - Repository functions (persistence, versioning, etc.)
 - KR languages (OWL, Common Logic, etc.)
 - Gatekeeping policies (open, curated, market, etc.)
 - Intellectual Property Rights policies
 - Federation mechanisms (OOR, RSS, OMV, etc.)
 - Value-added services (alignment, translation, etc.)
 - ...

OOOR Deployment Example



Initial Implementation



- Based on NCBO BioPortal
 - General-purpose ontology repository infrastructure
 - Supports RDFS/OWL, OBO, and LexGrid
 - Active user community
- Deployed in OOR sandbox and several development sites
- Developing Xen-vm and VMware images, as well as installation scripts, for easy deployment

Live Demonstration



- OOR sandbox
 - <http://oor-01.cim3.net>
- Selected screenshots included for the archival record

OOR Home Page



OOOR SANDBOX : Welcome to the OOR SANDBOX

http://oor-01.cim3.net/

ETR BBN Raytheon CNN WXYZ Apple DTE Outage Map Yahoo! Google Maps YouTube Wikipedia Popular News (565)

OOOR sandbox Browse Search Projects All Mappings All Resources Alpha Sign In Register Help/About Send Feedback

Welcome to the OOR SANDBOX

Use to access and share ontologies. You can [create ontology-based annotations for your own text](#), [link your own project that uses ontologies to the description of those ontologies](#), [find and create relations between terms in different ontologies](#), review and comment on ontologies and their components as you [browse](#) them. [Sign in to](#) to submit a new ontology or ontology-based project, provide comments on ontologies or add ontology mappings.

Search all ontologies

[Advanced Search](#)

Find an ontology

[Browse Ontologies >](#)

Search resources

[Advanced Resource Search](#)

Most Viewed Ontologies (October, 2009)

| Ontology | Views |
|----------|-------|
| | |
| | |
| | |
| | |
| | |

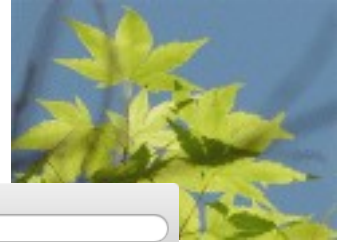
Statistics

| |
|--|
| |
| |
| |

- Latest Notes
- [This is a test note](#)
[notochord \(Amphibian gross anatomy\)](#)
04/08/10 Bargmeyer
This is a test note
 - [This is a test note](#)
[blastomere \(Amphibian gross anatomy\)](#)
04/08/10 Bargmeyer
This is a test note
 - [Test note:](#)
[digestive_system \(Amphibian gross anatomy\)](#)
03/12/10 Bargmeyer
Test note: Wouldn't tha appendix subclass go better under intestines?
 - [Test note add new subclass](#)
[digestive_system \(Amphibian gross anatomy\)](#)
03/12/10 Bargmeyer
Test. Add new subclass: appendix
 - [Test note](#)
[buccal_cavity \(Amphibian gross anatomy\)](#)
03/12/10 Bargmeyer
This is a test note

- Latest Mappings
- [Geometry \(Spatial Relations\) => qml:Geometry \(GEO_2007\)](#)
01/28/10 mdean
 - [qml:Geometry \(GEO_2007\) => Geometry \(Spatial Relations\)](#)
01/28/10 mdean
 - [Polygon \(Spatial Relations\) => qml:Polygon \(GEO_2007\)](#)
01/28/10 mdean
 - [qml:Polygon \(GEO_2007\) => Polygon \(Spatial Relations\)](#)
01/28/10 mdean

Browsing Ontologies



Browser window: OOR SANDBOX : Ontology Listing
Address bar: http://oor-01.cim3.net/ontologies
Navigation: ETR, BBN, Raytheon, CNN, WXYZ, Apple, DTE Outage Map, Yahoo!, Google Maps, YouTube, Wikipedia, Popular, News (565)
Menu: OOR sandbox | Browse | Search | Projects | All Mappings | All Resources Alpha | Sign In | Register | Help/About | Send Feedback

Access all ontologies that are available in OOR SANDBOX: You can filter this list by category to display ontologies relevant for a certain domain. You can also filter ontologies that belong to a certain group. [Subscribe to the OOR SANDBOX RSS feed](#) to receive alerts for submissions of new ontologies, new versions of ontologies, new notes, and new projects. You can subscribe to feeds for a specific ontology at the individual ontology page. Add a new ontology to OOR SANDBOX using the Submit New Ontology link (you need to [sign in](#) to see this link).

| | |
|--------------------|--|
| SUBMIT ONTOLOGY | Submit New Ontology |
| FILTER BY CATEGORY | All Categories |
| FILTER BY GROUP | All Groups Link To This Filter |
| FILTER BY TEXT | <input type="text"/> |

[Subscribe to all updates](#)

| ONTOLOGY NAME | FORMAT | VERSION | AUTHOR | UPLOADED ON | GROUP | STATUS |
|--|------------|-----------------|-------------------|-------------|-------|-------------------------|
| 11179-3e3-core (11179-3e3-core) | OWL | 0.1 | Bruce Bargmeyer | 04/07/2010 | | Explore |
| 11179-3e3-units (11179-3e3-units) | OWL | 0.1 | Test load on OOR | 04/07/2010 | | Explore |
| Amphibian gross anatomy (AAO) | OBO Format | 1.8 | AmphiAnat list | 02/12/2010 | | Explore |
| Amphibian taxonomy (ATO) | OBO Format | See Remote Site | AmphiAnat list | 02/12/2010 | | |
| Animal natural history and life history (ADW) | PROTEGE | See Remote Site | Animal Web | 02/12/2010 | | |
| Ascomycete phenotype ontology (APO) | OBO Format | 1.14 | SGD curators | 02/12/2010 | | Explore |
| Basic RDF Geo Vocabulary (wgs84_pos) | OWL | 2006-02-01 | Dan Brickley | 01/22/2010 | | Explore |
| Bilateria anatomy (BILA) | OBO Format | See Remote Site | Thorsten Heinrich | 02/12/2010 | | |
| Biological imaging methods (FBbi) | OBO Format | 1.1 | Kathy Matthews | 02/12/2010 | | Explore |
| BRENDA tissue / enzyme source (BTO) | OBO Format | See Remote Site | BRENDA ontology | 02/12/2010 | | |
| C. elegans development | OBO Format | 1.3 | Wen Chen | 02/12/2010 | | Explore |

Search Results

[http://oor-01.cim3.net/search](#)
Google

[ETR](#) [BBN](#) [Raytheon](#) [CNN](#) [WXYZ](#) [Apple](#) [DTE Outage Map](#) [Yahoo!](#) [Google Maps](#) [YouTube](#) [Wikipedia](#) [Popular](#) [News \(565\)](#)

oor sandbox
 [Browse](#)
[Search](#)
[Projects](#)
[All Mappings](#)
[All Resources](#)

[Sign In](#)
[Register](#)
[Help/About](#)
[Send Feedback](#)

Search all ontologies

Include attributes in search

Contains
 Exact Match

Loaded last search results from May 30, 10:43 PM

Most popular searches (all users):
[Spatial](#) [melanoma](#) [located](#) [near](#) [isaPhysicalPartOf](#) [math](#) [thyroid](#) [food](#)

Recent searches (all users):
[food](#) [PHYSICS](#) [substance](#) [box](#) [line](#) [spatial](#) [gis](#) [football](#) [car](#)

Selected Ontologies (45):
 All Ontologies

Categories: [All Categories](#)
 Groups: [Error loading groups](#)
 Filter:

Ontologies:

- 11179-3e3-core (11179-3e3-core)
- 11179-3e3-units (11179-3e3-units)
- Amphibian gross anatomy (AAO)
- Ascomycete phenotype ontology (APO)
- Basic RDF Geo Vocabulary (wgs84_pos)
- Biological imaging methods (FBbi)

Matching Terms

37 results

Filter:
 Exact Matches Only

5 ontologies


| Term Name | Ontology | Found In | Details | Visualize |
|--|--|----------------|---------|-----------|
| Person | Family Health History Ontology | Preferred Name | | |
| Person | Friend of a Friend | Preferred Name | | |
| Person | Friend of a Friend | Preferred Name | | |
| Person | COSMO | Preferred Name | | |
| PERSON_ | COSMO | Preferred Name | | |
| Natural-person | COSMO | Preferred Name | | |
| Person-SupportingFurniture | COSMO | Preferred Name | | |
| Person_Female | Family Health History Ontology | Preferred Name | | |
| Person_Male | Family Health History Ontology | Preferred Name | | |
| contact_person attribute | Mass spectrometry | Preferred Name | | |
| PersonalCircumstances | COSMO | Preferred Name | | |
| PersonalGrooming | COSMO | Preferred Name | | |
| PersonAttributeValue | COSMO | Preferred Name | | |
| PersonShaped | COSMO | Preferred Name | | |
| PersonalDevice | COSMO | Preferred Name | | |
| PersonalHygieneProduct | COSMO | Preferred Name | | |
| PersonalProfileDocument | Friend of a Friend | Preferred Name | | |
| PersonalPronoun | COSMO | Preferred Name | | |

Ontology Metadata

OOOR sandbox

Browse Search Projects All Mappings All Resources Alpha

Sign In Register Help/About Send Feedback

GEO_2007  Subscribe to updates

Metadata Views (0) Projects (1) Reviews (0) Metrics Ontology Widgets

| | |
|---------------------|---|
| ONTOLOGY NAME: | GEO_2007 |
| ONTOLOGY ID: | 1019 |
| FORMAT: | OWL |
| CATEGORIES: | |
| CONTACT: | Josh Lieberman, jlieberman@traversetechnologies.com |
| HOME PAGE: | |
| PUBLICATIONS PAGE: | |
| DOCUMENTATION PAGE: | http://www.w3.org/2005/Incubator/geo/XGR-geo-20071023/W3C_XGR_Geo_files/geo_2007.owl |
| DESCRIPTION: | Geo OWL ontology from the W3C Geospatial Incubator Group. |

Notes
No Notes Created yet

Mappings
[gml:Polygon](#) [gml:Geometry](#)

| VERSION NUMBER | RELEASE DATE | ONTOLOGY FILE | VISUALIZE | DOWNLOAD DIFF FILE |
|----------------|--------------|-----------------------------------|-------------------------|--------------------|
| 2007-10-23 | 10/23/2007 | Download Ontology | Explore | |

Powered by NCBO BioPortal [Release Notes](#) [Terms of Use](#) [Privacy Policy](#)

Ontology Mappings

The screenshot shows a web browser window with the URL `http://oor-01.cim3.net/visualize/10019/gml:Polygon#mappings`. The page title is "OOR sandbox" and the current view is "GEO_2007". The main navigation bar includes "Browse", "Search", "Projects", "All Mappings", and "All Resources Alpha". The "All Mappings" section is active, showing "gml:Polygon | Link Here | Subscribe".

The "View Ontology Summary" section is visible, with a "Jump To:" field and a "Go" button. The "Legend" section shows a tree structure of ontology classes:

- gml:Feature
 - gml:Geometry
 - gml:Envelope
 - gml:LinearRing
 - gml:LineString
 - gml:Point
 - gml:Polygon

The "Mappings (1)" tab is selected, showing a "New Point-to-Point Mapping" section. Below this is a table with the following data:

| MAPPING TO | SOURCE | MAPPED BY | MAPPED ON | NOTES |
|---|--------|-----------|-----------|----------------------------|
| Polygon (Spatial Relations) | | mdean | 01/28/10 | View Notes |

Ontology Submission

OR SANDBOX : Submit new ontology

http://oor-01.cim3.net/ontologies/new

Google

ETR BBN Raytheon CNN WXYZ Apple DTE Outage Map Yahoo! Google Maps YouTube Wikipedia Popular News (565)

oor sandbox Browse Search Projects All Mappings All Resources Alpha

Logged In As mdean My Account Log Out Help/About Send Feedback

GEO_2007

Submit New Ontology * fields are required

| | |
|--|---|
| ONTOLOGY NAME: * | <input type="text"/> |
| ONTOLOGY DESCRIPTION: * | <input type="text"/> |
| ONTOLOGY ABBREVIATION: * | <input type="text"/> |
| ONTOLOGY FORMAT: * | OWL |
| | PREFERRED NAME PROPERTY (OWL ONLY) (DEFAULT: RDFS:LABEL) <input type="text" value="use default"/> |
| | SYNONYM PROPERTY (OWL ONLY) (DEFAULT: SKOS:ALTLABEL) <input type="text" value="use default"/> |
| | DEFINITION PROPERTY (OWL ONLY) (DEFAULT: SKOS:DEFINITION) <input type="text" value="use default"/> |
| AUTHOR PROPERTY (OWL ONLY) (DEFAULT: DC:CREATOR) <input type="text" value="use default"/> | |
| ONTOLOGY VERSION: * | <input type="text"/> |
| DATE RELEASED: * | <input type="text"/> |
| FILE LOCATION * | <input type="radio"/> Upload (choose this option if you want users to be able to explore and search your ontology in OOR SANDBOX) |
| | <input type="radio"/> Remote (choose this option if you want users to search and view only the *metadata* for your ontology (but not its classes and properties) |
| FILE: * | <input type="button" value="Choose File"/> no file selected |
| CATEGORIES: (USE CTRL OR CMD TO SELECT MORE THAN ONE) | <ul style="list-style-type: none">AnatomyAnimal DevelopmentAnimal Gross AnatomyArabidopsisBiological ProcessBiomedical Resources |
| CONTACT NAME: | <input type="text"/> |
| CONTACT EMAIL: * | <input type="text"/> |
| HOME PAGE: | <input type="text"/> |
| DOCUMENTATION PAGE: | <input type="text"/> |
| PUBLICATIONS PAGE: | <input type="text"/> |

NCBO:BioPortal



NCBO BioPortal: Welcome to the NCBO BioPortal

http://bioportal.bioontology.org/

Google

ETR BBN Raytheon CNN WXYZ Apple DTE Outage Map Yahoo! Google Maps YouTube Wikipedia Popular News (565)

BioPortal Browse Search Projects Annotate All Mappings All Resources Alpha Sign In Register Help/About Send Feedback

Welcome to the NCBO Bioportal

Use BioPortal to access and share ontologies that are actively used in biomedical communities. You can search for terms in ontologies (try typing "Melanoma" in the "Search all ontologies" box in the left column), browse a list of ontologies in BioPortal (type "NCI Thesaurus" in the "Find an ontology" box in the middle column), search biomedical resources that we automatically annotated with ontology terms (try typing "Melanoma" in the "Search resources" box in the right column). You can [create ontology-based annotations for your own text](#), [link your own project that uses ontologies to the description of those ontologies](#), [find and create relations between terms in different ontologies](#), review and comment on ontologies and their components as you [browse](#) them. [Sign in to BioPortal](#) to submit a new ontology or ontology-based project, provide comments on ontologies or add ontology mappings.

Search all ontologies

Enter term, e.g. Melanoma

[Advanced Search](#)

Find an ontology

Enter ontology name, e.g. NCI Thesaurus

[Browse Ontologies >](#)

Search resources

Enter a term, e.g. Melanoma

[Advanced Resource Search](#)

Most Viewed Ontologies (January, 2010)

| Ontology | Views |
|--|-------|
| NCI Thesaurus | 1503 |
| Foundational Model of Anatomy | 774 |
| RadLex | 691 |
| Mouse adult gross anatomy | 627 |
| Ontology for Biomedical Investigations | 534 |

Statistics

| | |
|-------------------|-----------|
| Ontologies | 206 |
| Terms | 1,438,792 |
| Resources Indexed | 22 |

Latest Notes

[RE:Add Image to Data_Resource_branch Image \(Biomedical Resource Ontology\)](#)
05/25/10 whetzel
Leave in current location since Data_Resource branch changed.

[Deprecate Symbolic and Analytic Model \(Biomedical Resource Ontology\)](#) 05/25/10 whetzel
Deprecate this term, but leave child term for only child of Modeling and Simulation.

[RE:Deprecate or re-locate term Document Retrieval \(Biomedical Resource Ontology\)](#) 05/25/10 whetzel
Decided to leave this term at current location in hierarchy based on BRO TCon discussion.

[re-activate this term Web Service \(Biomedical Resource Ontology\)](#)
05/25/10 whetzel
Re-activate this term.

[RE:Move in hierarchy? Data Service \(Biomedical Resource Ontology\)](#)
05/25/10 whetzel
Add as direct child of software.

Latest Mappings

[data_measurement_protocol_execution \(Neural ElectroMagnetic Ontologies\) => Recording \(Cardiac Electrophysiology Ontology\)](#)
05/05/10 gfrishkoff

[Recording \(Cardiac Electrophysiology Ontology\) => data_measurement_protocol_execution \(Neural ElectroMagnetic Ontologies\)](#)
05/05/10 gfrishkoff

[voltage_amplifier \(Neural ElectroMagnetic Ontologies\) => Amplifier \(Cardiac Electrophysiology Ontology\)](#)
05/05/10 gfrishkoff

[Amplifier \(Cardiac Electrophysiology Ontology\) => voltage_amplifier \(Neural ElectroMagnetic Ontologies\)](#)
05/05/10 gfrishkoff

[experiment_instruction \(Neural ElectroMagnetic Ontologies\) => Instructions to subject \(NIFSTD\)](#)
05/05/10 gfrishkoff

The National Center for Biomedical Ontology is one of the [National Centers for Biomedical Computing](#) supported by the [NIH Roadmap](#).
Copyright © 2005-2009, The Board of Trustees of Leland Stanford Junior University. All rights reserved.
[NCBO Website](#) [Release Notes](#) [Terms of Use](#) [Privacy Policy](#)

Release 2.3.3 (released April 7, 2010)

Ref. NCBO - <http://bioontology.org>



Why OOR?



Desirable Properties



- Find ontologies easily
- Reliably available ontologies
- Persistent and sustainable source
- Quality and value - gauged by recognized criteria
- Supports services
 - Configuration Management
 - Mappings - connect ontologies
 - Alignment - align with mid and upper level ontologies
 - Search - find and be found
 - Review/rank



Desirable Properties (con't)

- Confidence when committing to use
 - Ontologies are registered with metadata
 - Metadata provides
 - Subject Domain
 - Purpose – Current Uses/Users
 - KR language
 - Originating organization
- Information about ontology changes
 - When
 - Why
 - How
 - Usability

Is It Good?



- **How to assess an ontology as ‘Good’?**
- Different needs require a range of goodness
- Machines are the primary consumers of ontologies
- ‘Imports’ create a strong transitive dependency between ontologies
- Changes in imported ontologies (directly or nested) can cause resulting import closures to be:
 - inconsistent
 - change meanings/interpretations
 - change computational characteristics
- Careful selection and precise reference is critical

Provenance



- **Need provenance to support ‘Goodness’ and trust**
 - Metadata can provide some
 - More is needed
 - Documentation – Natural Language descriptions and source references
 - Expressiveness, Granularity
 - Intended Uses
 - Ontology Alignments
 - Current users/uses
 - Development Methodology
 - Development/Change History
- **Assurance that best practices used**
 - Policies and procedures enforced

'Goodness' - Formal Ontology?



- Ontologies that allow the most extension require the most rigor (e.g., Upper Ontologies)
- More objective representation of a domain (i.e., minimize domain/SME biases)
- Allow appropriate levels of granularity
- Simplify ontological assumptions
- Ease development by deferring to well founded distinctions/classifications

OOR Goals



- A well-maintained persistent store (with high availability and performance) where ontological work can be stored, shared and accessed consistently;
- Mechanisms for registering and “governing” ontologies, with provenance and versioning, made available (logically) in one place so that they can be browsed, discovered, queried, analyzed, validated and reused;
- Services across disparate ontological artifacts supporting cross-domain interoperability, mapping, application and inferencing; and
- Registration of semantic services to support peer OORs

OOR Charter



Promote the global use and sharing of ontologies by:

- Establishing a hosted registry-repository;
- Enabling and facilitating open, federated, collaborative ontology repositories, and
- Establishing best practices for expressing interoperable ontology and taxonomy work in registry-repositories.

<http://OpenOntologyRepository.org>

OOR Initiative



- Started in January 2008 by [Peter Yim](#), [Leo Obrst](#), and [Mike Dean](#)
- OOR is an independent initiative, emerged from and incubated in the Ontolog Forum's collaborative work environment .
- ONTOLOG (a.k.a. "Ontolog Forum")
 - An open, international, virtual community of practice devoted to advancing the field of ontology, ontological architecture and engineering and semantic technologies, and advocating their adoption into mainstream applications and international standards
 - <http://ontolog.cim3.net/cgi-bin/wiki.pl?WikiHomePage>

OOR Requirements



- The repository architecture shall be scalable.
- The repository shall be distributed.
- The specification of the repository shall be sufficiently detailed and platform independent to allow multiple implementations.
- The repository shall be capable of supporting ontologies in languages that have reasoners [supporting inferencing].
- The repository architecture shall support distributed repositories.
- The repository architecture shall not require a hierarchical structure.

http://ontolog.cim3.net/cgi-bin/wiki.pl?OpenOntologyRepository_Requirement

OOR Architecture

- OOR requires an open and well documented architecture to
 - Allow multiple communities and organizations to participate in the OOR
 - Produce standard OOR functionalities and behaviors.
- OOR Architectural Principles
 - **Decoupling of responsibilities** – To support multiple knowledge representations/languages repository will not be there tightly coupled with the content.
 - **Implementation/Platform independence** – To support acceptance, multiple instances, and evolution, no particular implementation or platform dependence can be allowed.
 - **Ontologically driven** – To allow for evolution of the OOR and reduce overall development costs, the use of an ontologically based development environment is sought.

Current Participation



- Mailing list with 100+ subscribers worldwide
- Between Jan 2008 and now: more than 60 meetings and virtual events (team meetings, invited talks, panel discussions in the form of augmented conference calls)
- Featured at major events:
OntologySummit2008, ISWC 2009,
CENDI/NKOS 2008 & 2009, SOCoP 2009, ESWC
2010, SemTech 2010, ISWC 2010

Current Participation (con't)



- Technology contributions from
 - NCBO / Stanford-BMIR
 - CIM Engineering (CIM3)
 - Raytheon BBN
 - Northeastern University
 - University of Toronto
 - University of Bremen
 - ... (more – Your Organization?)

Current Participation (con't)



- Contributing to the discourse: communities and projects like BioPortal, ORATE, COLORE, NEU-Courses, SIO, XMDR, MMI, NeOn, SOCoP, ... and dozens of individuals from the ontology, semantic web, data modeling, enterprise architecture and software engineering communities

Organizing the Effort



- **Design, architecture** - Virtual panels sessions on Requirements, Use Cases; bi-weekly team conf calls; email list
- **Technology** - Open source project (in the style of Apache)
- **Content** - Looking for “content” down two tracks:
 - The more “traditional” ontologies (in RDF, SKOS, OWL, KIF, CLIF, etc.)
 - From the communities developing KOS/NKOS, classification schema, taxonomies, XML vocabulary & schema, database schema, etc.
- **Discourse on Issues** - e.g. IPR for ontologies and ontology repositories and registries

Ongoing Efforts



- Standing up an **OOR-sandbox** instance (Stanford/CIM3/NEU) -
<http://oor-01.cim3.net/ontologies>
- Standing up an **OOR code-repository** (BBN/NEU) - <http://oor.semwebcentral.org/>
- Positioning to stand up an **OOR-production** instance, which requires to be in place
 - Gatekeeping mechanisms
 - Proper policies

Ongoing Efforts (con't)



- **OOR-development instances**
 - NCBO: BioPortal - Stanford U. / Mark Musen, Natasha Noy, et al. - whose technology we are running, as our code-base
 - NEU: gatekeeping and policy dev - Northeastern U. / Ken Baclawski, et al. - via a Use Case Description Ontology (UCDO)
 - Raytheon BBN: federation - BBN / Mike Dean, Jim Chatigny, Dan Cerys
 - others: Bremen, MMI, Ryerson, MetHet, ORNL, ...

Ongoing Efforts (con't)



COLORE – Common Logic Ontology Repository

- U of Toronto / Michael Gruninger
- First order logic support for OOR
- Modularization



semantic technologies laboratory

COLORE

[COLORE](#) | [ONTOLOGIES](#) | [METADATA](#) | [PUBLICATIONS](#) | [TUTORIALS](#) | [CONTACT](#)

<http://stl.mie.utoronto.ca/colore/ordering/partial-ordering.clif>

```
(cl-module partial-ordering.clif
  (forall (x)
    (leq x x))
  (forall (x y)
    (if (and (leq x y)
              (leq y x))
        (= x y)))
  (forall (x y z)
    (if (and (leq x y)
              (leq y z))
        (leq x z)))
  (forall (x y)
    (iff (lt x y)
         (and (leq x y)
               (not (leq y x))))))
)
```

Ontologies

The ontologies in the repository are informally divided into the following clusters:

- *Foundational Ontologies*

These ontologies axiomatize the general mathematical structures that serve as the basis for the representation theorems of other ontologies in the repository.

- *Generic Ontologies*

The concepts axiomatized in these ontologies cover the range often associated with "upper ontologies".

- *Domain Ontologies*

These are ontologies that extend one or more generic ontologies, and which are associated with particular application domains.

Foundational Ontologies

- [Graphs](#)
- [Incidence Structures](#)
- [Linear and Partial Orderings](#)
- [Lattices](#)
- [ContactAlgebras](#)
- [Algebra](#)

Generic Ontologies

- [Time](#)
- [Duration](#)
- [Process](#)
- [Mereotopology](#)
- [Geometry](#)
- [Shape](#)

Domain Ontologies

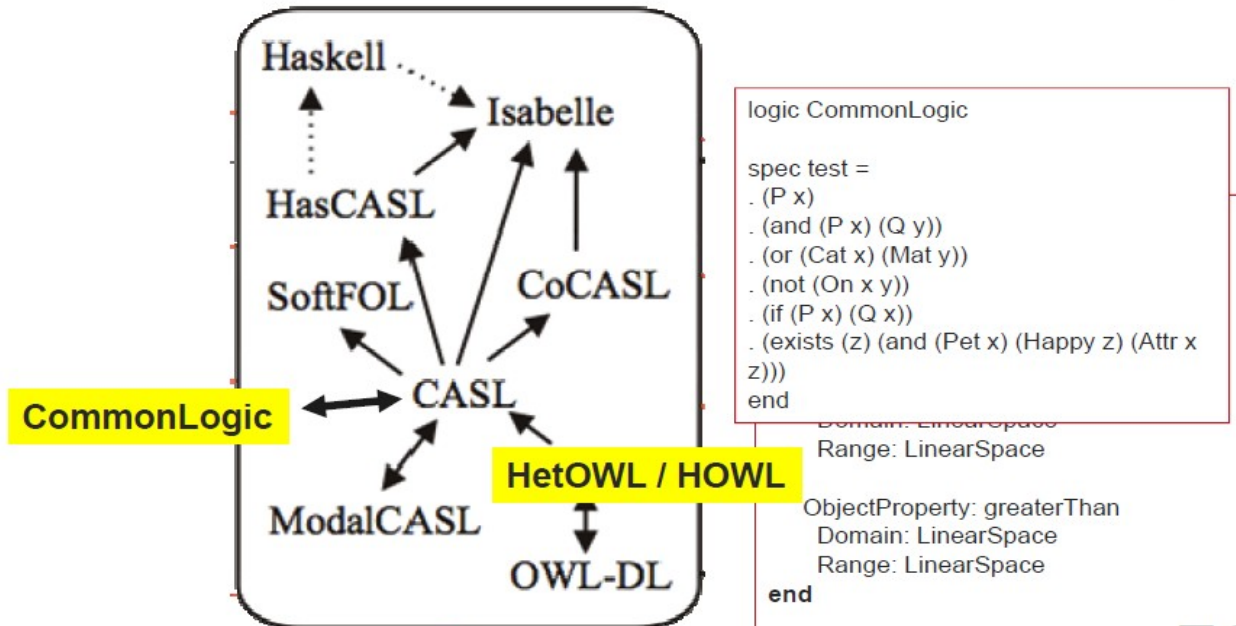
Ongoing Efforts (con't)



HeTS – the Heterogeneous Tool Set

- Bremen U (Germany) - John Bateman, Till Mossakowski, et al.
- formal support for modularity, language translation, mapping, etc.

HeTS: Continuing extension of the treated logics



Next Steps:

- integration of HeTS 'behind the scenes'
 - access to reasoners
 - move beyond OWL
 - extension to our full complement of alignment shapes
- semantic versioning

Ongoing Efforts (con't)



SIO – Sharing and Integrating Ontologies

- John Sowa and numerous contributors from the Ontolog Forum
- Applying the “Lattice of Theories” to resolving the classical challenges of interrelating disparate ontologies

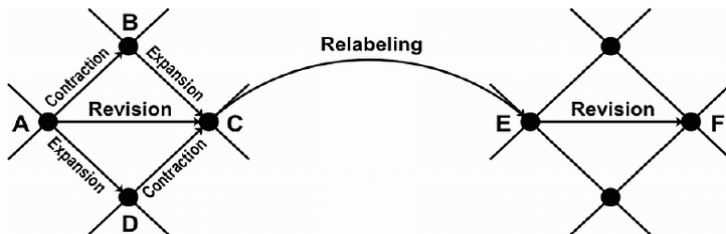
The SIO Players:

(the usual suspects: custodians from the UpperOntologySummit, ... etc.)

Pat Cassidy – COSMO, CDV, PIFO
Aldo Gangemi - DOLCE - Description & Situation extensions
Michael Gruninger - PSL / ISO 18629
Nicola Guarino - DOLCE
Barry Smith – BFO
Matthew West - ISO 15926
Adam Pease - SUMO
Doug Lenat - OpenCyc
John Bateman - Spatial Cognition, GUM, CASL, HeTS
John Sowa – Lattice of Theories
etc. ... and YOU!

Lattice of Theories

For any given logic, the set of all possible theories expressible in that logic forms a lattice.



The ordering is defined by specialization and generalization.
Adding axioms to a theory creates a more specialized theory.
Deleting axioms creates a more generalized theory.

Current OOR Priorities



- Continue to push OOR development and get more contributors
- Set up policies and process - policies for contributing to OOR work
 - Clear and easy policies and process to engage developers and have them contribute code
 - Build out "gatekeeping" and move from just having an OOR-sandbox to having available instances of an OOR-sandbox and an OOR-production
 - Clear and easy policies and process to engage content stewards and have them contribute ontologies to our public instance of OOR
- Get funding to continue and extend the work
- Systematically solicit content contribution
- Regularly review requirements and existing standards to make sure we are on track
- Continue efforts in publicity and outreach

Join the Fun !



- Join the [oor-forum] mailing list - mailto:
oor-forum-join@ontolog.cim3.net
- Come to our OOR-team conference calls -
Fridays (noon Eastern Time), every other week
- See: <http://OpenOntologyRepository.org>
- E-mail any one one of us if you have a
question (our email addresses are on the
cover slide)