

Suggested Upper Merged Ontology (SUMO)

CS690 – Week 4 Slides

Jordan Osecki

Summary

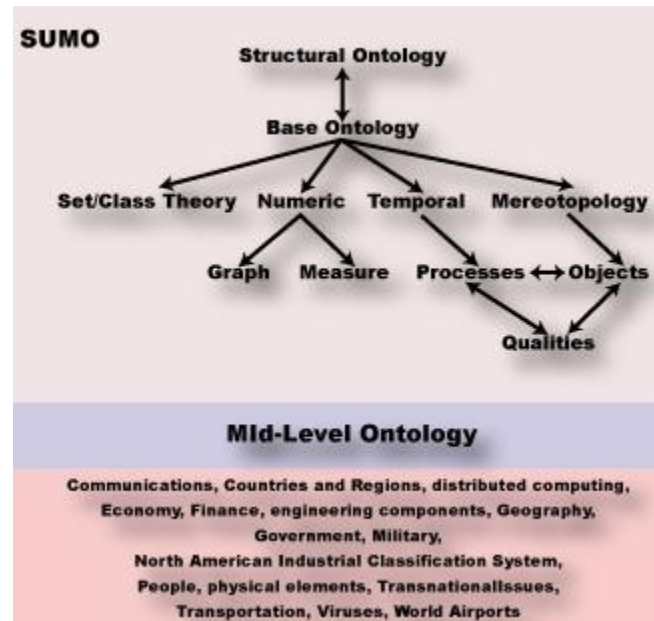
- SUMO and its domain ontologies form the largest public ontology in existence today
- Being used for research and applications in search, linguistics, and reasoning
- It is the only formal ontology that has been mapped to all of the WordNet lexicon
- Originally concerned with general entities that do not belong to a specific problem domain. It has now been considerably expanded to include a mid-level ontology and dozens of domain ontologies
- Source: <http://www.ontologyportal.org/>

How to use it?

- SUMO is free and owned by the IEEE, so it can be downloaded
- It is written in the SUO-KIF language, which is LISP-like
- It can also be downloaded in OWL RDF:
<http://www.ontologyportal.org/translations/SUMO.owl.txt>
- It has an associated open source “Sigma knowledge engineering environment”
- Source: <http://www.ontologyportal.org/>

Ontology Details

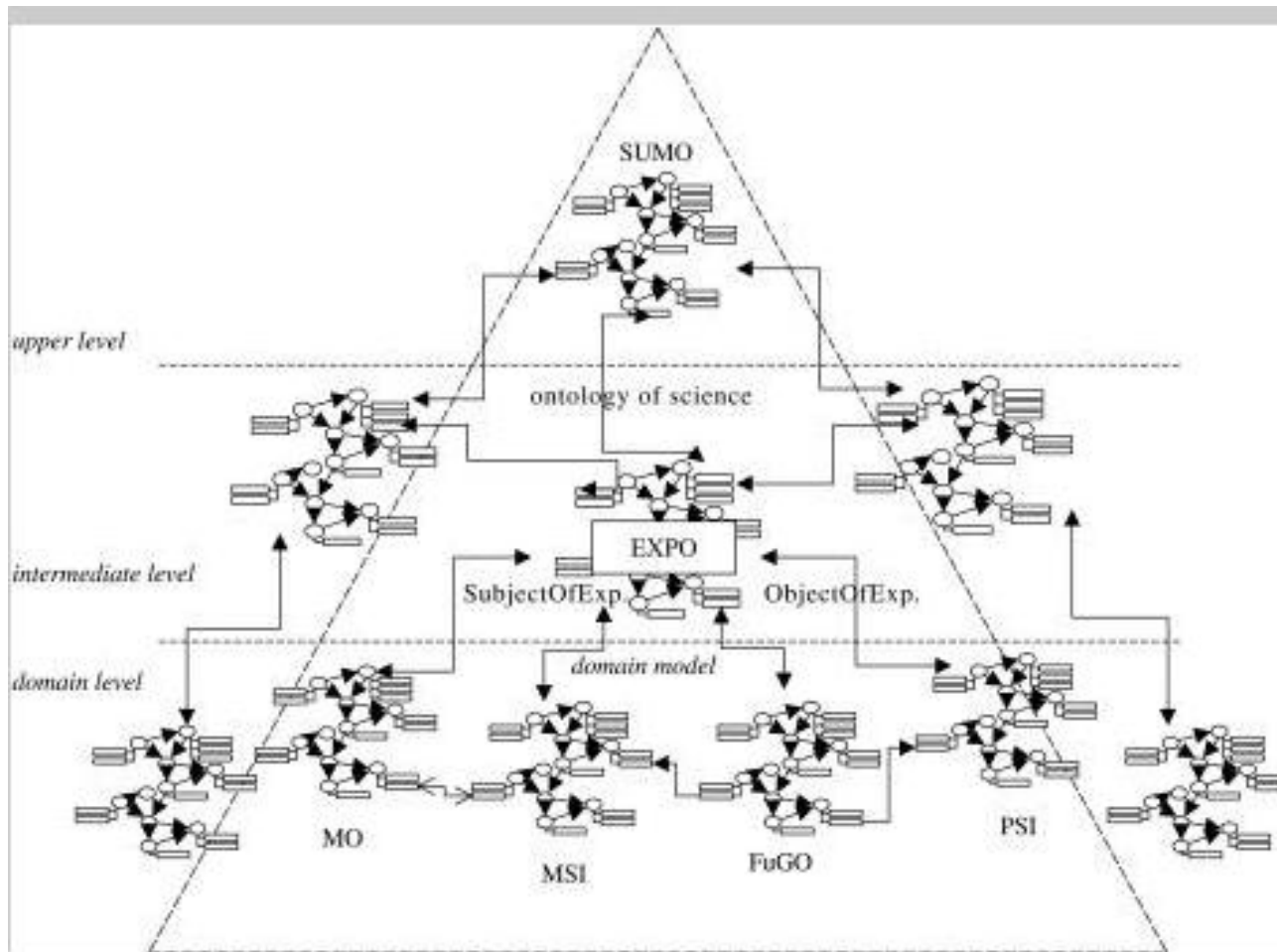
- SUMO Hierarchy Tree:
<http://virtual.cvut.cz/kifb/en/toc/0.html>
- SUMO Hierarchy Picture:
<http://www.ontologyportal.org/images/SUMOclasses.gif>



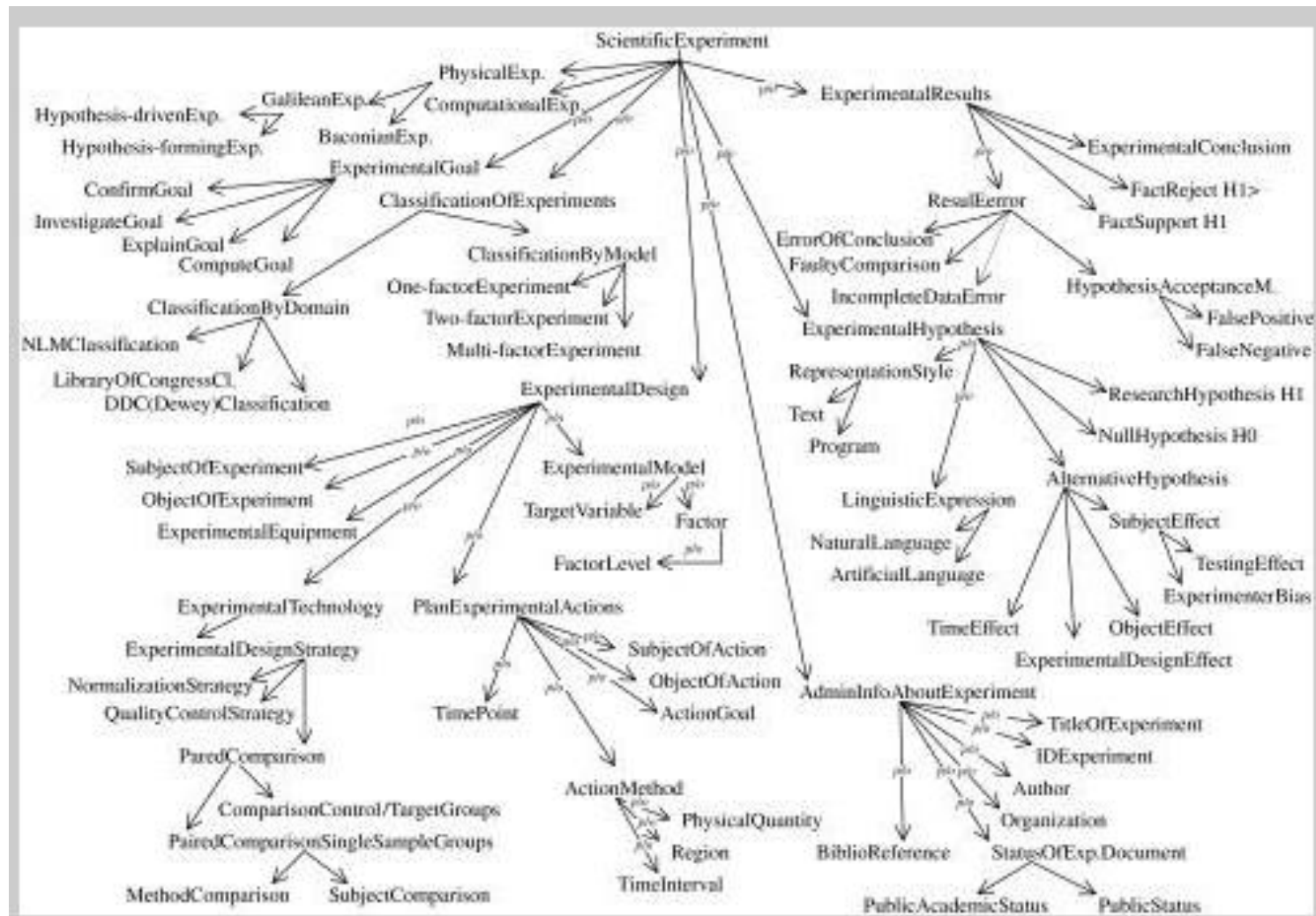
Example - EXPO

- EXPO System: links the SUMO ontology with subject-specific ontologies of scientific experiments by formalizing the generic concepts of experimental design, methodology, and results representation
- Demonstrated it with experiments in high-energy physics and in phylogenetics
- Paper:
<http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1885356>

Example - EXPO



Example - EXPO



OpenCyc

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Summary

- Cyc is an artificial intelligence project that attempts to assemble a comprehensive ontology and knowledge base of everyday common sense knowledge, with the goal of enabling AI applications to perform human-like reasoning
- Parts of the project are released as OpenCyc
- Source: <http://www.opencyc.org/doc/>,
Wikipedia

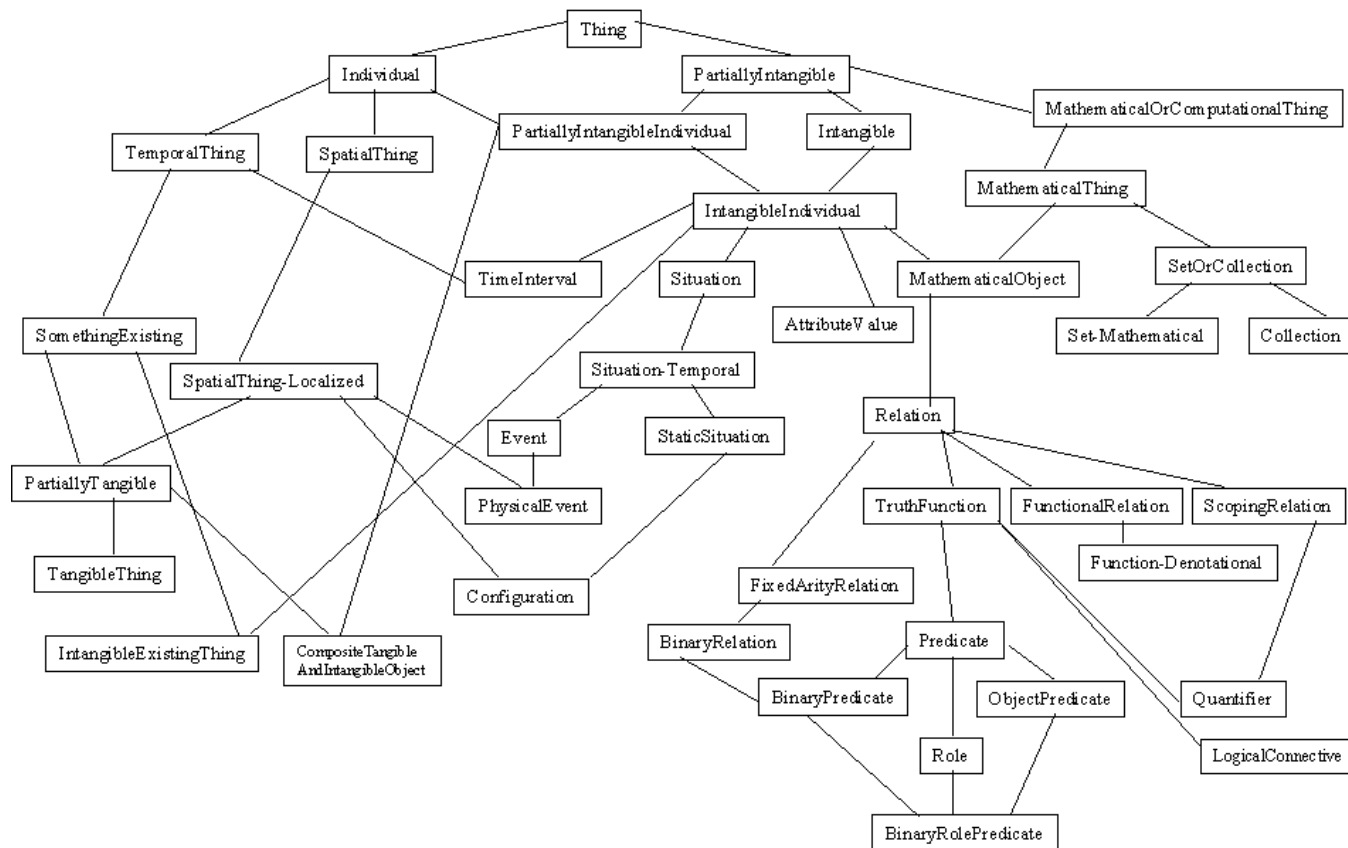
How to use it?

- OpenCyc provides the following:
 - API
 - RDF endpoint: <http://sw.opencyc.org/>
 - Data dump under an open source license
- Download from SourceForge

Ontology Details

- Selected Vocabulary:

<http://www.cyc.com/cycdoc/vocab/vocab-toc.html>



Example – Project CyN

- Project CyN is the merge of an AIML interpreter used to make chat bots with the OpenCyc inference engine
- Answers two questions:
 - What kind of natural language interface does OpenCyc have?
 - How can AIML chat bots be made to appear smarter?
- Source:
<http://www.daxtron.com/123start.htm?Cyn>

Example – Project CyN

- **Example Dialog:**

Is a human a mammal ?

-> Affirmative. I agree.

Is a dog a vegetable ?

-> Nope. I can't prove that.

Is a lion a animal ?

-> Affirmative. I think so.

Is a lion a product ?

-> Nope. I can't prove that.

Is a lion a thing ?

-> Affirmative. I believe that.

Is a dog a plant ?

-> Nope. I can't prove that.

Name some plant

-> FloweringPlant

Is a dog a person?

-> Negative. I can't say that.

Example – Project CyN

- **Example Dialog:**

Make Rover a Dog
Make Skippy a Dog

Is Skippy a Dog?
-> Affirmative. I think so.

Is Rover a Dog?
-> Right. I agree.

Is Skippy a person?
-> Nope. I can't prove that.

What is Skippy?
-> Thing, Individual, and Dog.

Is Skippy a mammal?
-> Right. I agree.

Is Skippy an animal?
-> Affirmative. I believe that.

Extension – SUMO vs. OpenCyc

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SUMO vs. OpenCyc

- Both are large extensive high level ontologies that hope to be able to classify everything in one way or another, with other ontologies for more specific fields building from the bottom of these ontologies.
- They differ in that OpenCyc does not contain the axiomatic rules of the large Cyc knowledge base, which is a commercial product. So OpenCyc is more of a taxonomy, whereas SUMO is a taxonomy and has a wealth of axiomatic knowledge