



Utilizing Uncertainty for Automated Ontology Mapping

A mapping module for the
Open Ontology Repository (OOR) Platform

Bart Gajderowicz

Ryerson University, Computer Science Department

August 6th, 2009

Motivation

- Closed World Knowledge Repositories interacting with the Open World
- To achieve a higher level automation, some form of **machine learning** will need to be incorporated
- Adding some level of **fuzzy** and/or **probabilistic** uncertainty will be necessary
- BioPortal Library
 - 140 Ontologies / 70k classes / 30k concept-to-concept mappings
 - ... **and growing**

Capabilities

- **Compare** existing and incoming ontologies
- Identify **similarities**
- Identify similar work and propose **collaboration**
- “Possibly” **combine/merge** ontologies to reduce duplication
- New dimension of **search** (based on generalized information)
- Fuzzy and probabilistic **reasoning**

Activities

- Research and develop **mapping algorithm**
- Introduce **uncertainty** using new and existing logics and languages
- Develop libraries to introduce uncertainty to **OOR**
 - Allow for Fuzzy and Probabilistic Uncertainty
 - Incorporate existing BioPortal mapping mechanism and tools
 - Stored as an RDF Ontology
 - Integrate the **URW3-XG[§]** Uncertainty Ontology to the BioPortal mapping tools

§ <http://www.w3.org/2005/Incubator/urw3/XGR-urw3-20080331/>

Activities con't

- Develop support for required **logics**
 - First Order Logic
 - Description Logic

- Develop support for required **languages**
 - Web Ontology Language (OWL)
 - Resource Description Framework (RDF)
 - Common Logic (CL)
 - Open Biomedical Ontologies (OBO) Format
 - Protégé Frame Language

Thank you

Bart Gajderowicz
bgajdero@ryerson.ca
www.scs.ryerson.ca/~bgajdero