Department of Mathematics, Statistics and Computer Science
St. Francis Xavier University
Presents

Relation Ontology

by

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The business of controlled vocabularies and supervised scientific nomenclature has entered a new era with the advent of OWL-based ontologies. Ontology-grounded efforts directed at regimenting widely (but inconsistently) used biomedical terms have blossomed quite spectacularly into a huge internationally coordinated movement, which involves hundreds of researchers at the forefront of biomedical science. The OBO Foundry, as it is called, has set as its core mission the establishment of a basic set of ontology design guidelines that are supposed to enable scientists to build interoperable ontologies, hence fostering communication and collaboration in a world that finds itself in increasing danger of being smothered under the pressure of heaps of brute, unanalyzed, quasi-chaotic data.

All such ontologies and controlled vocabularies can be conceived as graph-theoretical structures made up of *terms* (the nodes) connected together by *relations* (the graph edges). While the focus of ontology developers has been directed, in a first instance, towards securing the accuracy of nodes, much less work has been devoted to ensuring the non-ambiguity, and general well-behaved character, of the edges. This is essentially the motivation that stays behind efforts to build a *relation* ontology (RO). Prior to its arrival, all relations employed by even the most serious OBO Foundry ontologies had a highly informal character, which contributed to a very poor rendering of logical relationships between nodes. By offering a full first-order logic reconstruction of existing relations (*is_a*, *part_of* etc.), relation ontology fulfils the desire of logical clarity and rigor; it also constitutes a definite push towards removing the other obstacle in the path of more expressive ontologies: the *paucity of resources* for expressing relations in most of the OBO Foundry ontologies. Efforts aimed at extending the reach of such types of endeavors are under heavy development, via enhancing the range of relations available with those capable to handle spatial connectivity, deviation from normality, causality and function etc. With respect to the latter, relation ontology can benefit enormously from previous work in System Theory (ST) and Cybernetics, and should consequently focus on adapting key system-theoretic concepts that have proven their usefulness and reliability in disciplines where such techniques and modular thinking have become the *de facto* standard (e.g. Electronics Engineering, Automatic Systems and Control, etc.).

After quickly covering some ontology background, the lecture will concentrate on a presentation of relation ontology and, time permitting, of efforts to extend its scope by means of incorporating some much-needed system-theoretic vocabulary.

Refreshments will be served before the talk in AX24A