



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

What Happens When we add Logic to Descriptions?

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Simulating a human reasoning process requires that extensive knowledge about a certain domain be represented and stored in a knowledge base (i.e. an Ontology). Ontologies have now been adopted by many disciplines, such as biology and e-science, as part of their integration into the Semantic Web, which is defined as a "web of data" allowing machines to understand the meaning of and process the information on the World Wide Web.

This talk will introduce Description Logics as a formal knowledge representation language and a logical foundation for the Semantic Web. The main reasoning services will be reviewed together with their challenges. It turns out that the more expressive an Ontology is, the harder it becomes to make sense out of the knowledge it represents, similar to human reasoning! A particular challenge we have addressed is handling numerical restrictions (cardinalities) in descriptions. We illustrate some of the progress that has been made using algebraic reasoning and give an overview of work in progress using high performance computing.