

JOSHI CENTER ROOM 372  
RESEARCH LABORATORY



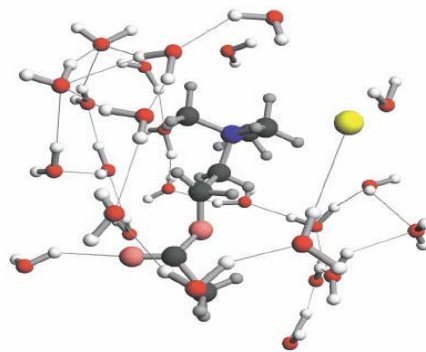
Computer Science and Engineering Department

## Semantic Science Lab

Faculty and Graduate Student Research Laboratory

Kno.e.sis Center (<http://knoesis.org>)

Knowledge Enabled Services and Information Science



The Semantic Science Research Laboratory investigates the areas of knowledge representation and formal logic within the various scientific disciplines. We specifically focus on ontological modeling and reasoning with Semantic Web technologies and currently have projects within the domains of life science and sensor networks.

### Life Science

Research in many biological systems, particularly those involving infectious agents, continues to experience an enormous increase in information with the sequencing of genomes, the use of expression profiling, and the completion of proteomic analyses. These dynamic datasets are distributed over multiple databases that undergo frequent additions and curation. Biologists often need to query multiple sources of data simultaneously in the course of their research, which pertain to the same domain (e.g., T.cruzi) but are distinct types of data (e.g., genomic, proteomic, immunologic). We have worked on

- Developing large, complex, and open source ontologies.
- Comprehensive framework for automated semantic provenance annotation of proteomics experimental data.
- Biological applications and tools implemented and deployed as Web based semantic Web service.
- Scientific workflows for high throughput scientific experiments that use semantic Web services.

### Sensor Networks

Millions of sensors around the globe currently collect avalanches of data about our environment. With a view to alleviating this problem, we propose that sensor data be annotated with semantic metadata to provide contextual information essential for situational awareness. In particular, we present an approach to annotating sensor data with spatial, temporal, and thematic semantic metadata. This technique builds on current standardization efforts within the W3C and Open Geospatial Consortium. (OGC) and extends them with semantic Web technologies to provide enhanced descriptions and access to sensor data.