

## **Position Statement**

Nancy Wiegand, Isabel Cruz, Naijun Zhou, and William Sunna

Nancy Wiegand, Isabel Cruz, Naijun Zhou, and William Sunna are working together on a semantic integration project. Nancy Wiegand is a Research Scientist at the University of Wisconsin in Madison. Although her main focus is in Computer Science Database Management Systems, her background also includes interdisciplinary work in Geographic Information Systems, Civil Engineering, and Environmental Studies. Isabel Cruz is a Professor of Computer Science at the University of Illinois at Chicago. Naijun Zhou and William Sunna are graduate students at UW-Madison and Illinois, respectively. Naijun Zhou is a Ph.D. candidate in Geography and also has a Master's degree in Computer Science. William Sunna is studying Computer Science.

Our Computer Science and interdisciplinary backgrounds are being applied to a research project for a proposed Web-based statewide Wisconsin Land Information System. We are working on semantic integration over distributed, heterogeneous spatial and nonspatial data sets to enable DBMS-type querying. Our goal of DBMS querying is an extension of the clearinghouse vision of the original working group. Our research also includes methods for locating data sets and consideration of separate metadata files that describe data sources.

We developed a tool to map theme-based ontologies to local schemas, and, in particular, included the ability to map at the value level, in addition to the attribute level. This was necessary because various attributes in our data sources are conceptually similar, but their values are drawn from domains that differ in detail and expression. The mapping tool automatically produces agreement files which are consulted by an ontology subsystem for query re-writing. The ontology subsystem is embedded in a prototype XML Web-based query engine.

A hard problem in semantic integration is to provide easy extensibility for new ways of thinking about and relating information. Also, users should be able to trace and validate any automatically made semantic integration decisions to be able to confidently use results for decision-making.