

## ▼ Introduction to Software Agents and Semantic Web Technologies Minitrack

Thomas E. Potok  
Oak Ridge National Lab  
potokte@ornl.gov

Mark T. Elmore  
Oak Ridge National Lab  
elmorete@ornl.gov

Yu (Cathy) Jiao  
Oak Ridge National Lab  
jiaoy@ornl.gov

The Software Agent paradigm is a powerful advancement in the progression of software engineering from procedural, to object-oriented, to agent-oriented approach. It emphasizes goal-driving autonomous software entities (agents) that may exhibit communication, cooperation, and mobility, and may react and adapt to their environment. The Semantic Web seeks to enrich that environment, extending the World Wide Web from a web for human users into a web for Software Agents as well, where agents provide a powerful assist to the human users. The World Wide Web requires the human user to find data and to provide semantic (ontological) understanding to bridge multiple data sources, discern data suitability for the problem at hand, and fuse data to finally provide understanding for human decision-making. The Semantic Web empowers Software Agents to perform these tasks more rapidly, more thoroughly, and more concisely, freeing the human user to focus on understanding and decision-making.

Before a ubiquitous and Software Agent-enabled Semantic Web can be fully realized, there are a number of challenging issues in a number of divergent disciplines that must be solved. How can we better gather, fuse, interpret, analyze, and visualize the massive amounts of information stored on the Web? How can we provide a rapid and profound understanding of the information that is available on the Web? This minitrack seeks to explore novel, multidisciplinary research in these and other broad issues related to the use of Software Agents and Semantic Web technologies.

Incredible volumes of information, much of it in the form of digital media, are readily available from virtually any computer in the world. Unfortunately, this increase in information often overwhelms the people it is intending to help. This phenomenon can be seen in business, science, military, and government. The Semantic Web holds the promise of being as revolutionary as was the World Wide Web.

Massive, diverse sets of digital documents will be available and ideally machine-understandable in a manner previously unattainable. The use of Software Agents is an integral part of the Semantic Web, and the use of Software Agents, both capitalizing on Semantic Web technologies and in non-Semantic Web applications, continues to gather momentum.

Software Agent and Semantic Web technologies include data fusion and federation; metadata, data markup, and ontologies; mechanisms for finding and connecting Semantic Web resources; usability issues; information retrieval and organization. Our aim is to bring together researchers who bridge one or more of these technologies in discovering critical information in large and changing data and in enabling the Semantic Web to empower these technologies.

This minitrack covers the following main topics:

- Software Agents
- Semantic Web and Web Services
- Grid Computing, Global Information Grid, and Semantic Grid
- Textual, Imagery, and Sensor Data Analysis
- Scientific, Business, and Military Data Analysis
- Usability
- Ontology Research
- Agent and Semantic Web Service Security
- Agent-based Information systems