

Atila Elçi, Mamadou Tadiou Koné, and Mehmet A. Orgun (Eds.)

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Semantic Agent Systems

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# Semantic Agent Systems

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# Preface

To bring our contribution to the advancement of the semantic Web and agent technologies, around November 2005, we initiated the series of *IEEE International Workshops on Engineering Semantic Agent Systems* in conjunction with the *30th International Computer Software and Applications Conference (COMPSAC 2006)* in Chicago, Illinois, USA. Encouraged by five very successful annual workshops and two journal special issues on this theme, we felt confident that the research on semantic agents system has become mature enough to gather from experts and practitioners contributions for an edited volume in the series *Studies in Computational Intelligence* by Springer-Verlag.

The theme of this book, semantic agent systems, refers to the integration of semantic Web, artificial intelligence, and software agent technologies. Here semantic Web is described as a Web of semantically-linked data which aims to enable man, machine, and software to carry out more useful tasks. Central to this theme are software agents with the power to use linked data and its associated semantics through technologies such as RDF, SPARQL, OWL, and SKOS. When these software agents are elements of cooperating multi-agent systems, a whole host of new opportunities emerges. Research and development in this direction need more effort and dedication like the contributions in this book.

To appeal to a wide range of audiences, we organized this book along four main parts: The first part titled *Introduction to Agents and Semantics* aims to give the reader an idea of what a semantic agent system is in the first place. Here, Rule Responder is presented as a framework for semantic multi-agent systems which support collaborative teams. Then, handling complex obligations with semantic Web techniques in the context of multi-agent systems is presented. Finally, a noteworthy contribution of semantic Web technology to the field of distributed knowledge management is pointed out.

Part two titled *Engineering Semantic Agent Systems* deals with ontology development and management for agent systems in addition to agent-oriented software engineering. Here, we read about information governance,

argumentation and reconciliation issues, complexity for MAS design, and composition of business processes, and human-robot interactions.

Part three titled *Applications of Semantic Agent Systems* deals with semantic Web applied to specific areas and pertinent lessons learned from these applications. Contributions in this section highlight domains as diverse as the cyber-physical world, manufacturing systems, context-aware mobile learning services, and user interests.

In the last part titled *Future Outlook*, we discover in great detail many of the intricacies of machine understanding and their potential in future research directions. The reader is led in this section to one of the foundations of the theme of this book: semantic agents with understanding abilities.

We are grateful to many authors who brought their contributions to this book with their valuable studies. We would like to express our appreciation to the reviewers who accepted to read and give their insightful comments on these contributions. Without their help and expert opinions, it would have been impossible to make decisions on each submitted paper and produce such a high-quality volume.

Our special thanks go to Thomas Ditzinger, Engineering Editor at Springer Verlag and responsible for the series *Studies in Computational Intelligence*, for his support, cooperation, patience and understanding. We kept in mind all along that this book was made possible through the foresight, timely initiative, and unfaltering support of Janusz Kacprzyk, the Editor-in-Chief of the *Studies in Computational Intelligence* Series.

November 2010

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