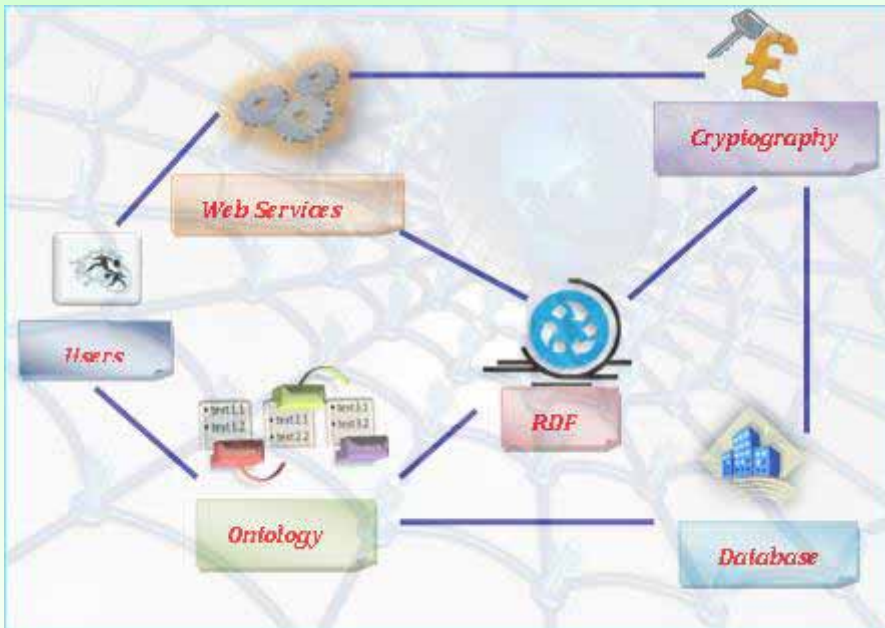


**Manish Joshi**  
**Harold Boley**  
**Rajendra Akerker (Eds.)**

# Advances in Semantic Computing

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**Manish Joshi • Harold Boley • Rajendra Akerkar (Eds.)**

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**Editors:****Manish Joshi**

*Department of Computer  
Science,  
North Maharashtra  
University,  
Jalgaon, MS,  
425 001 India*

**Harold Boley**

*Semantic Web Laboratory  
Institute for Information  
Technology, NRC  
46 Dineen Drive,  
Fredericton, NB,  
E3B 9W4, Canada*

**Rajendra Akerkar**

*Western Norway Research  
Institute  
6851 Sogndal  
Norway*

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# Preamble

Semantic Computing (SC) is a rapidly evolving area that combines insights from Computational Linguistics, Semantic Web, Knowledge Engineering, and Software Engineering, with the goal of creating novel technologies and applications that connect intuitively formulated user intentions with the content and meaning of machine-represented data. The user and the content are connected via semantic interfaces, semantic analysis, semantic integration, and semantic applications. A major objective of SC thus is to develop methods for automatically constructing semantic representations from user input.

The e-book "Advances in Semantic Computing" is an open access collection of six chapters covering a spectrum of SC topics. The chapters were reviewed by the e-book's Scientific Review Committee. They are written to be self-contained, providing modularity and flexibility for readers.

The first chapter "Uncertainty and Rule Extensions to Description Logics and Semantic Web Ontologies", by Jidi Zhao, provides a comprehensive overview of existing approaches to handle uncertainty. A summarized classification of the approaches according to four different aspects is presented. This chapter also reviews a number of techniques for integrating ontologies with rules. The theoretical proposals and practical implementations of the rule extensions to DLs and ontologies are classified into two categories, which are presented as homogeneous and hybrid approaches.

The second chapter titled "Business Rules Using OWL and SWRL", authored by Alan Meech, elaborates how OWL/SWRL captures important features needed for Business Rule Modeling. An exemplary list of semantic reasoners is provided and issues related with the use of reasoners to obtain business rules are discussed.

The third chapter, "OWL Ontology for Solar UV Exposure and Human Health", written by Cambillau Mathieu, El-Shanta Eltaher, Purushotham Sarathy, and Simeu Gilles describes a case study of how to build an exemplary ontology using Protégé for a health care domain. The authors further explained the creation and usage of a knowledge-based application that determines the impact of Solar UV exposure on Human Health.

The fourth chapter, "Ontology-based Negotiation of Dental Therapy Options", authored by Mahsa Kiani, Micheal Francis, Yassaman Zand Moghaddam, and Palash Verma. This chapter elaborates an application in a subfield of dental medicine. Using an ontology and rules, the system maps local concepts of collaborating medical experts to global concepts providing a common layer for negotiation. Different alternatives are considered in the attempt to reach an agreement. The proposed system has been applied in decision making about wisdom teeth treatment options.

The fifth chapter authored by S. Sendhilkumar and T. V. Gettha, titled "Concept based Personalized Web Search", discusses experiments to improve the effectiveness of personalized web search systems. Traditional personalized web search systems do not bother to analyze the relevance of unvisited pages. However, some of the unvisited pages may contain information useful to the user. The authors'

experiments in identifying such unvisited but relevant pages, through semantic search path analysis, is presented in the chapter.

The sixth chapter, “A comparative study of Learning Object Metadata, Learning Material Repositories and Automatic Metadata Annotation”, authored by Devshri Roy, Sudeshna Sarkar and Sujoy Ghose introduces about use of semantic computing in e-learning applications. Many learning object repositories that store high quality learning material are available. It is essential that this expensive-to-create learning materials must be reused properly. Semantically tagging the learning material with metadata ensures that appropriate learning material can be identified easily. The authors explore the feasibility of tagging learning material automatically using IEEE LOM specifications. They also present a probabilistic neural network-based standard classification approach to automatically identify the topics of learning materials. The experimental results are shared in the chapter.

The editors hope that readers of the e-book "Advances in Semantic Computing" will benefit from this edited volume by becoming aware of these recent advances in the field. We would like to thank the authors and members of the Scientific Review Committee for their contributions to the e-book.

We acknowledge the publisher of the e-book, TMRF, and thank the developers of the EasyChair Conference System, which helped us to organize the reviewing process for the e-book.

May 08, 2010

**Manish Joshi**  
**Harold Boley**  
**Rajendra Akerkar**

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**Technomathematics Research Foundation, Kolhapur, India**

**E-mail: [tmrfservices@gmail.com](mailto:tmrfservices@gmail.com)**

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