1 Introduction

Recently, ontologies have moved from a topic in philosophy to a topic in applied artificial intelligence that is at the center of modern computer science. Tim Berners-Lee, Director of the World Wide Web Consortium, referred to the future of the current WWW as the *Semantic Web* – an extended Web of machine-readable information and automated services that extend far beyond current capabilities. The explicit representation of the semantics underlying data, programs, pages, and other Web resources will enable a knowledge-based Web that provides a qualitatively new level of service. Automated services will improve in their capacity to assist humans in achieving their goals by "understanding" more of the content on the Web, and thus providing more accurate filtering, categorization, and searches of information sources. This process will ultimately lead to an extremely knowledgeable system that features various specialized reasoning services. These services will support us in nearly all aspects of our daily life – making access to information as pervasive, and necessary, as access to electricity is today.

The backbone technology for this Semantic Web is *ontologies*. Ontologies provide a shared understanding of certain domains that can be communicated between people and application systems. Ontologies are formal structures supporting knowledge sharing and reuse. They can be used to represent explicitly the semantics of structured and semistructured information enabling sophisticated automatic support for acquiring, maintaining, and accessing information. As this is at the center of recent problems in knowledge management, enterprise application integration, and e-commerce, increasing interest in ontologies is not surprising. Therefore, a number of books have recently been published to cover this area. Examples are [Davies et al., 2003], [Fensel et al., 2002(a)], [Fensel et al., 2003], [Gomez Perez & Benjamins, 2002], and [Maedche, 2002]. However, these other publications are either collections of papers written by a diverse group of authors or they focus on a specific aspect of ontologies, for example, ontology learning. The book *Ontologies: A Silver Bullet for Knowledge Management and Electronic Commerce* is one of the few single-authored books that provide comprehensive and concise introductions to the field. The first edition had the merit of being the first book that introduced this area to a broader audience. Compared to the first edition, three major improvements have been made for the second edition:

- Many recent trends in languages, tools, and applications have been integrated and the material has been updated quite substantially, reflecting the dynamics of our area of interest.
- The book is clearly structured into four sections: the concepts underlying ontologies; the languages used to define ontologies; the tool to work with ontologies; and the application areas of ontologies.
- Many small mistakes have been eliminated from the text.

Chapter 2 provides a definition of ontologies and illustrates various aspects of ontologies. Chapter 3 provides a survey of ontology languages, especially in the context of the Web and the Semantic Web. Chapter 4 provides examples of all relevant aspects that arise when working with ontologies. Even commercial tool sets have become available and are described in this chapter. Finally, no technology without its applications. Chapter 5 discusses the application of ontologies in areas such as knowledge management, enterprise application integration, and e-commerce.

All that remains is for me to wish the reader enjoyment and entertainment while reading about one of the most exciting areas of computer science today.

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