Jérôme Lang
Fangzhen Lin
Ju Wang (Eds.)

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Knowledge Science, Engineering and Management

First International Conference, KSEM 2006
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Preface

This volume contains the papers accepted for presentation at KSEM 2006, the First International Conference on Knowledge Science, Engineering and Management, held in Guilin, Guangxi, China, August 5-8, 2006.

The aim of this interdisciplinary conference is to provide a forum for researchers in the broad areas of knowledge science, knowledge engineering, and knowledge management to exchange ideas and to report state-of-the-art research results. While each of these three broad areas has had dedicated conferences, so far there has been no event bringing together researchers from all three areas, and KSEM aims at filling this gap.

The technical program of KSEM 2006 comprised four invited talks, given by Thomas Eiter, Ruqian Lu, Yoshiteru Nakamori, and Kwok Kee Wei, and 51 refereed contributions selected by the Program Committee out of 450 submissions. Finally, the program included two tutorials, given by Paul Buitelaar and Michael Thielscher.

This conference was initiated by Ruqian Lu, in conjunction with his project on Non-Canonical Knowledge Processing funded by the Natural Science Foundation of China (NSFC) as a Major Research Initiative. There is no doubt that without Ruqian's hard work and crucial support, this conference would not have come into being. We would also like to thank the members of this NSFC project for their support at various stages of the conference.

The success of this conference depends on the generous help of many people. We thank the Conference Chairs, Jörg Siekmann and Chengqi Zhang, for their support, particularly in helping to secure the publication of the proceedings as a volume in the Springer LNAI series. The Tutorial Chair, Cungen Cao, did a wonderful job in getting two excellent tutorials. The two Publicity Chairs, Shuigeng Zhou and Zili Zhang, did such a good job that we were literally overwhelmed by the large number of submissions.

We are grateful to the Area Chairs, the members of our Program Committee and the external referees for their thorough efforts in reviewing contributions with expertise and patience. The PC chairs would particularly like to thank Yin Chen for his help throughout the entire process. We also thank Andrei Voronkov for developing the free EasyChair system that made our difficult job manageable.

May 2006

Jérôme Lang
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Regular Papers

On Representational Issues About Combinations of Classical Theories with Nonmonotonic Rules*

Jos de Bruijn[1], Thomas Eiter[2], Axel Polleres[1,3], and Hans Tompits[2]

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Abstract. In the context of current efforts around Semantic-Web languages, the combination of classical theories in classical first-order logic (and in particular of ontologies in various description logics) with rule languages rooted in logic programming is receiving considerable attention. Existing approaches such as SWRL, dl-programs, and $\mathcal{DL}$+*log*, differ significantly in the way ontologies interact with (nonmonotonic) rules bases. In this paper, we identify fundamental representational issues which need to be addressed by such combinations and formulate a number of formal principles which help to characterize and classify existing and possible future approaches to the combination of rules and classical theories. We use the formal principles to explicate the underlying assumptions of current approaches. Finally, we propose a number of settings, based on our analysis of the representational issues and the fundamental principles underlying current approaches.

1 Introduction

The question of combining different knowledge-representation formalisms is recently gaining increasing interest in the context of the Semantic-Web initiative. While the W3C recommendation of the OWL Web ontology language [1] has been around for over two years, attention is now shifting towards defining a rule language for the Semantic Web which integrates with OWL. From a formal point of view, OWL (DL) can be seen as a syntactic variant of an expressive description logic [2], viz. $\mathcal{SHOIN}(\mathbf{D})$ [3], which is a decidable subset of classical first-order logic. In this sense, OWL follows the

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