

1st International Workshop on Knowledge Representation and Approximate Reasoning (KR&AR)

During the last decades, traditional knowledge representation and approximate reasoning (including soft computing) have become mature fields in AI. Many significant techniques and methods have been developed in each of the two areas. On the other hand, there are not enough connections between these fields and the communities rarely have a chance to meet, interact and exchange ideas in a relaxed and inspiring atmosphere.

This exchange of ideas is particularly important today due to the use of affordable robotics platforms where sensor data must be integrated with more qualitative forms of knowledge and in the area of softotics and the www where approximate knowledge structures are becoming increasingly more important.

In order to bridge gaps between the two areas and create a forum for exchange of ideas, we organized a small workshop gathering researchers active in the above fields (see <http://www.twp.olsztyn.pl/krar/>).

The workshop gathered over 30 participants, who presented basic research results as well as application-oriented technologies. These included software systems, concentrating on foundations and applications of approximate reasoning and knowledge representation methods.

Due to the very high quality of presentations we decided to edit a separate volume of *Fundamenta Informaticae* containing extended papers submitted after the workshop and related to its topics. These include:

- logical foundations of approximate reasoning; in particular:
 - paper [4] concentrates on a general framework for measures of information and conflict, based on quasi-possibilistic logic
 - paper [6] integrates modal and many-valued approaches to characterizing belief functions
- applications of approximate reasoning techniques; in particular:

- paper [3] introduces notions of approximate ontologies and discusses methods their extraction from data
 - paper [7] shows how the action language Golog can be extended to handle certain types of uncertainty which arise in robotics applications
 - paper [11] presents a new approach to defeasible reasoning, relaxing some restrictions of existing defeasible logics while still retaining tractability of reasoning
 - paper [12] presents an approach to approximated reasoning by integrating rough sets theory with logic programming
- logical foundations of knowledge representation, in particular:
 - paper [1] is devoted to the duality between automata and tableaux for description logics
 - paper [8] provides a modal approach to game theory in the context of multi-agent systems and shows a modal characterization of the Nash equilibrium
 - paper [9] investigates a modal logic of probability and shows its applications in the context of belief and actions
 - applications of knowledge representation methods, in particular:
 - paper [2] presents a solution of execution monitoring of multi-agent systems via planning where agent collaboration is described declaratively as an action theory
 - paper [5] presents a robot control system for robots acting in known structured dynamic environments, but it also provides methods for dealing with unexpected situations
 - paper [10] concerns a problem of preferences in answer set programming and provides a uniform setting to formalize a problem of preferences among answer sets.

Olsztyn, Poland was the venue for the workshop. We would like to thank the University of Economics and Computer Science in Olsztyn (Wyższa Szkoła Informatyki i Ekonomii TWP w Olsztynie) for organizing the workshop, excellent local arrangements as well as for their valuable financial support.

We would also like to thank the participants of the workshop for making it a truly insightful and enjoyable event.

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- [12] Vitoria, A., Damasio, C., Maluszynski, J.: From rough sets to rough knowledge bases.