Invited Presentations at the Twelfth International Conference on Principles of Knowledge Representation and Reasoning

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Yoav Shoham
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Reasoning about Actions and Change: From Single Agent Actions to Multi-Agent Actions

Invited Talk by Chitta Baral

We often deal with dynamic worlds where actions are executed by agents and events may happen. Examples of such worlds range from virtual worlds such as the world of a database to robots and humans in physical worlds. To understand the dynamics of such worlds as well as to be able to assert some control over such worlds one needs to reason about the actions and events and how they may change the world. In this invited talk I will present some of the important results in this field and present some future directions. In particular, I will discuss how theories and results from reasoning about actions and change can be combined with theories and results in dynamic epistemic logics to obtain a unified theory of multi-agent actions.

(An extended abstract of this talk is included in this proceedings.)

Scalable Ontology Systems

Invited Talk by Ian Horrocks

Ontologies and ontology based systems are rapidly becoming mainstream technologies, with RDF and OWL now being deployed in diverse application domains, and with major technology vendors starting to augment their existing systems with ontological reasoning. For example, Oracle Inc. recently enhanced its well-known database management system with modules that use RDF/OWL ontologies to support "semantic data management," and their product brochure lists numerous application areas that can benefit from this technology, including enterprise information integration, knowledge mining, finance, compliance management and life science research. While gratifying to the KR research community, this success also brings with it many challenges. In particular, ontology reasoning systems will need to exhibit robust scalability if deployments in large scale applications are to be successful. In this talk I will review the evolution of ontology systems to date, and show how KR theory developed into a mainstream technology. I will then go on to examine the challenges arising from deployment in large scale applications, and discuss recent research aimed at addressing them.

Logics of Intention and the Database Perspective

Invited Talk by Yoav Shoham

The seminal paper by Cohen and Levesque, trying to capture in logic certain intuitions about intention and its relation with other mental constructs, has been followed up by a series of papers proposing various amendments to the original proposal. I will suggest a slight twist on the subject, one that is based on an unabashed computational perspective. I will discuss this so-called "database perspective," as well as some of its subtle logical implications.