Ontology, Rules, and Logic Programming for Reasoning and Applications

(RulesReasoningLP)

Session 3

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Topics: Ontology, Rules, Reasoning, Logic Programming, and Applications

http://ontolog.cim3.net/cgi-bin/wiki.pl?RulesReasoningLP#nid3XS0

- Ontology-Rule Knowledge Representation containing Classical Logic, Declarative Logic Programs (Pure Prolog), and Rulelog
  - Standards incl.: Rule Interchange Format, RuleML, and Common Logic
- Ontology and Rule Reasoning Tools, Systems: Requirements, Design, Implementation
  - Examples include Semantic Web and Description Logic-based systems, First-Order Logic systems, Logic Programming systems, Rulelog systems, and Hybrid Description Logic + Logic Programming (Description Logic Programming) systems
  - E.g., Cyc, Pellet, Jena, Prover9, Vampire, SILK, Coherent, RuleLog; various Prologs such as SWI-Prolog, XSB Prolog, Ciao Prolog, Prova, Flora-2
  - Answer Set Programming, Constraint Logic Programming, Deductive Databases, SAT and SMT reasoners, decision-support systems, business rule systems, etc. [Deductive, Inductive, Abductive, Probabilistic, etc., reasoning]
- Ontology and Rule Reasoning Optimization: Knowledge Compilation from Development Time Ontologies and Rules to Run-Time Reasoning, Tabling, Memo-izing, Extensionalizing, Delayed / Lazy Evaluation, Type Subsumption Encodings, etc.
- Ontology and Rule Reasoning Applications
Goals
http://ontolog.cim3.net/cgi-bin/wiki.pl?RulesReasoningLP#nid3XS5

1) Sketch out the current field of ontology and rule reasoning: what are the relevant standards, architectures, reasoning methods, reasoning engines, techniques, and applications?

2) Provide a perspective on emerging technologies, techniques, and tools relevant for ontology and rule reasoning

3) Discuss the issues and architectures involved in developing applications that use ontology and rule reasoning

4) Describe visualization and explanation technologies and techniques for ontology and rule reasoning
Mini-Series Program – sessions
[each with co-chairs listed]
http://ontolog.cim3.net/cgi-bin/wiki.pl?RulesReasoningLP#nid3XRK

6. … And more to come …
Today’s Agenda

• The second of two sessions devoted to addressing the concepts and foundations of the technologies underlying ontology and rule reasoning, especially focused on the Semantic Web and Logic Programming

• Today’s Panelists:
  – Dr. Markus Kroetzsch (Technische Universität Dresden) - "Existential Rules in Ontological Modelling"
  – Dr. Hector Perez-Urbina (Clark & Parsia, LLC) - "Modeling with Rules in Practice"
  – Professor Hassan Aït-Kaci (Université Claude Bernard Lyon) - "Reasoning and the Semantic Web"
  – Professor Enrico Franconi (Free University of Bozen-Bolzano) - "The Logic of Extensional RDFS"

• Q&A and open discussion (30 min)