Multi-Context Systems: A Flexible Approach for Integrating Heterogeneous Knowledge Sources

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In this talk we give an overview on multi-context systems (MCS) with a special focus on their recent nonmonotonic extensions.

MCS provide a flexible, principled account of integrating heterogeneous knowledge sources, a task that is becoming more and more relevant. By a knowledge source we mean a knowledge base (KB) formulated in any of the typical knowledge representation languages, including classical logic, description logics, modal or temporal logics, but also nonmonotonic formalisms like logic programs under answer set semantics or default logic. The basic idea is to describe the information flow among different KBs declaratively, using so-called bridge rules. The semantics of MCS is based on the definition of an equilibrium.

We will motivate the need for such systems, describe what has been achieved in this area, discuss work in progress and introduce generalizations of the existing framework which we consider useful.

Joint work with Thomas Eiter and Michael Fink (both TU Vienna).

Gerhard Brewka was born in 1955 in Regensburg, Germany. He received the diploma in Computer Science from University of Bonn in 1984 and the Ph.D. in Computer Science from University of Hamburg in 1989. He was a member of the Artificial Intelligence Group of Gesellschaft für Mathematik und Datenverarbeitung, Sankt Augustin, from 1984 to 1994 and visiting researcher at the International Computer Science Institute, Berkeley, CA, from 1991 to 1992. In January 1995 he became full professor for Knowledge Based Systems at the Technical University of Vienna. Since September 1996 he is chair for Intelligent Systems at the University of Leipzig where he is heading the doctoral programme in knowledge representation. Since 2002 he is an ECCAI Fellow selected by the European Coordinating Committee of Artificial Intelligence.

Research Interests:

- nonmonotonic reasoning
- answer set programming
- preference and inconsistency handling
- reasoning about action
- models of argumentation
- qualitative decision making
- multi-context reasoning

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