Integration of Rules and Facts Via Priorities and Interlingua (Statement of Current Research)

Benjamin N. Grosof
IBM T.J. Watson Research Center
P.O. Box 704, Yorktown Heights, NY 10532, USA
grosof@us.ibm.com http://www.research.ibm.com/people/g/grosof/
(914) 784-7783 ; fax -7455 ; -7100 main

An important problem in information integration is coping with conflict and inconsistency. We address the problem of integrating multiple pure logic programs (LP's) in the presence of conflict. We give an integration approach that builds upon the **courteous logic programs** knowledge representation (KR), a semantically attractive and computationally tractable form of prioritized default rules that expressively supersumes ordinary LP's. Any courteous LP can be tractably **compiled** into a semantically equivalent ordinary LP.

Another important problem in information integration that we address is coping with the heterogeneity of rule/fact representations, especially among commercially important rule-based systems/agents. We give an approach to this heterogeneity problem that centers around a rule **interlingua** that is based on logic programs (in the sense of declarative knowledge representation, not just Prolog).

We have implemented DIPLOMAT [Grosof, 1999b], a **running prototype in Java** of courteous LP's including courteous compiler and interlingua translators. This is currently being piloted in several commercial applications efforts in e-commerce, including exchanging business policies, negotiating contracts/agreements, representing authorization/security policies, and personalizing electronic storefronts. DIPLOMAT includes the interlingua capability to translate ordinary LP's (e.g., the results of its compilation) to and fro multiple other pre-existing ordinary-LP inferencing engines, e.g., Prolog systems and intelligent agent systems. DIPLOMAT currently implements such compiling for 3 such OLP engines. The interlingua also translates to and fro ANSI Knowledge Interchange Format (**KIF**)[1]. The interlingua furthermore translates to and fro an **XML format** for courteous LP's. This XML format, for which we have defined the XML Data Type Definition, also functions as an XML format for a large expressive subset of KIF which overlaps (semantically as well as syntactically) with courteous LP's.

DIPLOMAT will be released publicly **on the Web as a free alpha** in spring of 1999.

References

[Grosof, 1999b] Grosof, B. N. 1999b. DIPLOMAT: Compiling Prioritized Default Rules Into Ordinary Logic Programs, for E-Commerce Applications (extended abstract of Intelligent Systems Demonstration). In *Proceedings of AAAI-99*. San Francisco, CA, USA: Morgan Kaufmann. Extended version available as an IBM Research Report, Apr. 1999. http://www.research.ibm.com.

For additional references, see the author's Web page (URL above).

[1] `http://logic.stanford.edu/kif/` and `http://www.cs.umbc.edu/kif/`.