Linköping Electronic Articles in
Computer and Information Science
Vol. 5(1999): nr 21

A Framework for Multi-Agent Belief Revision, Part II: A Layered Model and Shared Knowledge Structure

Wei Liu and Mary-Anne Williams

Linköping University Electronic Press
Linköping, Sweden

http://www.ep.liu.se/ea/cis/1999/021/

Posted on April 6,
formally published on December 21, 1999
by Linköping University Electronic Press
581 83 Linköping, Sweden

Linköping Electronic Articles in
Computer and Information Science
ISSN 1401-9841
Series editor: Erik Sandewall

Recommended citation:
<Author>. <Title>. Linköping Electronic Articles in
Computer and Information Science, Vol. 5(1999): nr 21.
http://www.ep.liu.se/ea/cis/1999/021/. *December 21, 1999.*

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Abstract

In this paper, a framework of a belief revision agent in a multi-agent environment is presented. In the agent knowledge kernel, by separating domain knowledge from social knowledge, various level of belief revision capabilities has been modularized into multiple interactive layers. A vertical 4-layer 2-pass architecture is adopted for the BR engine. Therefore, the framework can model various levels of belief revision, including Single Belief Revision, BR using information from Multiple Sources and Multi-Agent Belief Revision. In order to achieve multi-agent belief revision in a heterogenous society, a Shared Knowledge Structure(SKS) is proposed, which allows the sharing of knowledge as well as protecting private knowledge. Using graded knowledge in the SKS, the process of multi-agent belief revision is implemented using knowledge migration, which is the procedure that reshapes the knowledge structure triggered by the new information.

For technical reasons, this article is stored as two separate computer files, labelled "Part I" and "Part II", respectively. Please replace the present page by a printout of the "Part II" file.