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Refereed Article

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An Application-based Comparison of Automated Theory Formation and Inductive Logic Programming

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Abstract: *Automated theory formation involves the production of examples, concepts and hypotheses about the concepts. The HR program performs automated theory formation and has been used to form theories in mathematical domains. In addition to providing a plausible model for automated theory formation, HR has been applied to some applications in machine learning. We discuss HR's application to inducing definitions from examples, scientific discovery, problem solving and puzzle generation. For each problem, we look at how a theory formation was applied, and mention some initial results using HR.*

Our aim is not to describe the applications in great detail, but rather to provide an overview of how HR is used for these problems. We do this to facilitate a comparison of HR and the Progol machine learning system, which employs inductive logic programming. We do this by comparing the concept formation these programs perform and by comparing how the programs are (or could be) applied to the four problems discussed.

Publication and review history

This work was first presented at the Machine Intelligence 17 Workshop, held on July 19-21, 2000 at Bury St Edmunds, Suffolk, UK. Attendance at this workshop was based on invitations. Speakers at the workshop were invited to submit their articles for consideration in the forthcoming workshop volume. The subsequent publication and review history for the present article was as follows.

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5. Revised version appears in Electronic Transactions on Artificial Intellligence, Volume 4 (2000), section B, pages 97–117. The section and the annual volume are made permanently available at
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6. Paper editions of the ETAI issue and the ETAI volume containing this artice *republished* by the Royal Swedish Academy of Sciences.

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