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## Editorial

## Empirically successful computerized reasoning

This special issue of the *Journal of Applied Logic* is based around the topic of the “Empirically Successful Computerized Reasoning” (ESCoR) workshop, held as part of the *Third International Joint Conference on Automated Reasoning* at the *2006 Federated Logic Conference*, Seattle, USA, August 2006. The workshop was concerned with the implementation and deployment of working computerized reasoning systems, using all forms of reasoning (automated, interactive, etc.) and all kinds of logics (classical, non-classical, all orders, etc.). Submissions for this special issue were solicited from the ESCoR workshop participants, and also accepted from the broader community. Twenty-three papers were submitted, of which seven have been accepted by peer review. Five of the seven accepted papers are extended versions of papers presented at the ESCoR workshop, including papers from the two invited speakers at the workshop. Five of the papers discuss systems, and two discuss applications.

The papers in this special issue describe empirically successful systems and applications, using and combining a broad range of reasoning tools for various logics, from interactive higher-order theorem provers, to fully automated first-order theorem provers, model builders, SAT solvers and description logic systems. Kaufmann, Moore, Ray and Reeber have developed an interface connecting the ACL2 theorem prover to external reasoning tools. The paper describes this interface, the necessary mechanisms, and the logical requirements for the safe integration of verified and unverified external reasoners. Weber and Amjad describe the integration of two leading SAT solvers with interactive higher-order logic theorem provers. The paper focuses on efficiency issues of reconstructing large proof traces from the SAT solvers in the interactive provers. Meng and Paulson are interested in the integration of first-order resolution provers and interactive higher-order theorem provers. They describe the implementation and evaluation of an automated relevance filter for removing irrelevant clauses from resolution problems, in order to speed-up the finding of proofs. The paper by Baumgartner, Fuchs, De Nivelle and Tinelli is concerned with the problem of finding finite models of sets of first-order clauses. The authors present and test an approach that is based on the combination of a reduction to the class of function-free first-order clauses and decision procedures for this class. Wessel and Möller describe a generic framework for building ontology-based information systems using a standard description logic reasoner. In a case study the framework is applied to spatio-thematic query answering in the domain of digital city maps. Bos gives an account of experiences with standard first-order theorem provers and model generators in three different applications in the area of natural language processing. Finally, the paper by Rabe, Pudlak, Sutcliffe and Shen describes the application of automated reasoning methods for automatically determining the subset relation between two given axiomatizations of normal and non-normal propositional modal logics. A system using various encodings of the problems in first-order logic and different first-order automated reasoning tools has been developed and tested.

We thank the authors of all papers submitted to the workshop and the special issue for their interest and their contributions. Thanks also go to the workshop program committee and their reviewers, as well as to the extended committee and the reviewers of the special issue for carefully reviewing the papers.

Renate A. Schmidt\*

University of Manchester, UK

E-mail address: [renate.schmidt@manchester.ac.uk](mailto:renate.schmidt@manchester.ac.uk)

Geoff Sutcliffe

University of Miami, USA

Stephan Schulz

TU München, Germany

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\* Corresponding guest editor. Address: School of Computer Science, University of Manchester, Oxford Road, Manchester M13 9PL, UK.