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Journal of Symbolic Computation

journal homepage: www.elsevier.com/locate/jsc

Foreword

First-order theorem proving: Foreword

This special issue of the Journal of Symbolic Computation is dedicated to first-order theorem proving, and was initiated after the 7th International Workshop on First-Order Theorem Proving (FTP 2009) took place.

The First-Order Theorem Proving Workshop Series is intended to focus effort on First-Order Theorem Proving as a core theme of Automated Deduction, and to provide a forum for presentation of recent work and discussion of research in progress. The seventh edition was held in July 2009, in Oslo, Norway. The workshop was co-located with the 18th International Conference on Automated Deduction with Analytic Tableaux and Related Methods (TABLEAUX 2009). Following this workshop, a general call for contributions to this special issue of the Journal of Symbolic Computation on First-Order Theorem Proving — not restricted to the papers presented at FTP 2009 — was issued. Submissions on topics including theorem proving in first-order classical logic, many valued logic, description logic and modal logic, strategies and complexity of theorem proving procedures, decision procedures, and applications of first-order theorem proving were encouraged.

All submissions have been thoroughly reviewed by two or three experts, and five papers were finally selected for publication. They cover a variety of topics in Automated Theorem Proving, ranging from theoretical work on inference systems to more concrete applications in web service verification.

In the paper *"Model Evolution with Equality — Revised and Implemented"*, Peter Baumgartner, Björn Pelzer and Cesare Tinelli show how to integrate equational reasoning into the Model Evolution calculus, which can be seen as a lifting of the DPLL procedure to first-order logic.

The paper *"Incremental Variable Splitting"* written by Christian Mahesh Hansen, Martin Giese, Arild Waaler and Roger Antonsen presents a free-variable tableau calculus for classical logic combining the incremental closure approach of Giese with the technique of variable splitting as defined by Antonson and Waaler. The method has been implemented and detailed performance results are presented.

In *"On the Verification of Security-Aware E-Services"*, Silvio Ranise describes two extensions of the relational transducers previously introduced by Abiteboul, Vianu, Fordham and Yesha for the specification and verification of transaction protocols of web services, and proves the decidability of two relevant verification problems, namely goal reachability and log validation.

In his paper *"Projection and Scope-Determined Circumscription"*, Christoph Wernhard develops a semantic framework containing operations of projection and rising and an interesting generalization of circumscription, called Scope-Determined Circumscription.

Finally, the paper *"lim+, delta+, and Non-Permutability of beta-Steps"* by Claus-Peter Wirth is devoted to a detailed analysis of the non-permutability phenomenon of γ- and δ-steps in free-variable sequents or tableaux calculi.

We want to thank all the people who made this special issue possible: first the authors for their very valuable contributions, the referees for their thorough and extensive reviews, and Hoon Hong, the Editor-In-Chief of the Journal of Symbolic Computation, for his help and constant support. We also

thank the organizers of Tableaux 2009 for taking care of practical matters and the steering committee of FTP (in particular Ullrich Hustadt) for their strong support.

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