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Preface

This special issue of *Information and Computation* contains 5 papers that were presented in preliminary form at the 12th International Conference on Rewriting Techniques and Applications (RTA 2001), which was held May 22–24, 2001 at Utrecht University in The Netherlands.

Out of the 55 papers submitted to RTA 2001, the program committee selected 25 for presentation. Additionally there were invited talks by Arvind, Henk Barendregt, and Michaël Rusinowitch. Out of these, 5 papers were invited to this special issue, for which they were completely revised and extended. I am grateful to the members of the program committee and the referees for all the work they put in the process.

The first paper in this issue, “A rewriting approach to satisfiability procedures,” by Alessandro Armando, Silvio Ranise, and Michaël Rusinowitch, shows how a standard superposition-based inference system for first-order equational logic can be used to decide satisfiability in a number of logical theories that arise in verification problems. This is a remarkable result of significant practical interest.

In the second paper, “Orienting rewrite rules with the Knuth-Bendix order,” Konstantin Korovin and Andrei Voronkov present polynomial time algorithms for (i) deciding whether there exists a Knuth-Bendix order that orients a given set of rewrite rules and (ii) deciding whether a given Knuth-Bendix order satisfies a single ordering constraint. The former problem is proved to be P-complete. It is also shown that integer-based Knuth-Bendix orders have the same power as real-based ones.

The third paper, “The unification problem for confluent right-ground term rewriting systems,” by Michio Oyamaguchi and Yoshikatsu Ohta, shows the decidability of the unification problem for confluent right-ground term rewrite systems. This deep result is an important contribution to the study of the boundary between decidable and undecidable unifications problems and a significant extension of previous work.

In the fourth paper, “A formalised first-order confluence proof for the λ -calculus using one-sorted variable names,” René Vestergaard and James Brotherston address the often neglected but fundamental issue of names in the λ -calculus. The authors present a formalised first-order confluence proof of the λ -calculus, conducted exclusively by the primitive proof principles of the standard syntax.

The final paper in this issue, “The context-splittable normal form for Church-Rosser language systems,” by Jens R. Woinowski, was awarded the best paper prize by the program committee of RTA 2001. In this paper the surprising and important result is shown that all Church-Rosser languages can be defined by string rewrite rules of the form $uvw \rightarrow uxw$ with v being nonempty and x having at most one symbol.

A. Middeldorp
Guest Editor