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Rewriting Techniques and Applications

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Foreword

This *First International Conference on Rewriting Techniques and Applications*, held in Dijon, Burgundy, France, May 20–22, 1985, was preceded by an earlier workshop at Schenectady, New York, USA. This first Worshop was organized as an answer to the surge of interest in term rewriting techniques. This surge has been sparked both by significant progress in understanding the theorical aspects of rewriting systems and by the development of important new applications to these systems.

While the progress of research into rewriting systems has been significant, it has been impeded by the inordinate difficulty of implementing and using the increasingly complex algorithms prevalent in state–of–the–art term rewriting research. The main purpose of the first workshop was to offer to a wide community an easy access to sophisticated softwares.

Today, those software are used by a very large community and support many applications, some of them being described in these proceedings. Our goal now is to provide a regular forum for people working in the field of term rewriting or using term rewriting techniques in other fields of computer science. This conference proves the need of such a forum, both by focusing on new important advances in term rewriting technologies, and on new applications. I hope that this is a good start towards a regular international conference.

To emphasize the success of the conference, the committee decided to award Kathy Yelick, for her paper *Combining unification algorithms for confined regular equational theories.* The reasons are the following:
- Unification is a main topic in term rewriting techniques, and we are pleased to recognize a significant contribution in this area.
- Kathy Yelick is currently completing her master's degree at MIT, and we are pleased to recognize a major advance in this field by a young student.
- Yelick's paper solves a problem left open for many years: how to obtain a complete unification algorithm for a combination of theories that individually have a complete unification algorithm. More precisely, she shows how to lift a complete unification algorithm for the variable only case of each individual theory to a complete unification algorithm for the whole theory, under two basic assumptions on individual theories: they must be *confined* (i.e., involve different sets of symbols); they must be *regular* (i.e., the axioms must have exactly the same variables on their left and right hand sides, and a variable cannot be a left or right hand side of an axiom).

As a particular consequence, she obtains a completeness proof for Stickel's famous associative–commutative unification algorithm. As she points out, lifting the variable only case was the main difficulty of this algorithm, whose termination was only recently proved by François Fages in a paper published in the proceedings of CADE, 1984.

A few others should be mentioned, because they have made similar or related progress in this area: Claude Kirchner from Nancy, recently addressed the same problem, independently from Kathy Yelick. Based on a different approach, his algorithm is able to handle erasing axioms. However, theories are also assumed to be permutative, i.e., have finite congruence classes. Although they are different, both algorithms use complexity measures in order to prove termination. Not surprisingly, both complexity measures are variations around Fages's complexity measure used for proving termination of Stickel's algorithm. Fages's work should therefore also be recognized as a major step towards these new advances.

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Jean-Pierre Jouannaud

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