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Foreword

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The Conference on Theoretical Aspects of Computer Software (*TACS '91*) was organized by Professors Albert Meyer of the MIT, Cambridge, MA, USA, and Takasu Ito of Tohoku University, Sendai, Japan, and took place in Sendai, Japan, on 24–27 September 1991. *TACS '91* focused on the theoretical foundations of programming, and theoretical aspects of the design, analysis and implementation of programming languages and systems.

It was decided during the conference that two special issues will be devoted to the publication of selected contributions to the conference—one on the Science of Computer Programming, to be edited by ourselves, and the other on the Information of Computation, to be edited by Mariangola Dezani-Ciancaglini.

The selected papers presented in this special issue focus on two topics particularly relevant to this journal: program verification and the semantics of programming languages.

The paper by Abadi, Burrows, Kaufman, and Lampson deals with the problem of authentication of users in distributed systems. The authors propose several protocols based on smart-cards and analyze them with a logic for describing the beliefs of principals in the course of authentication.

The paper by Steffen studies data flow analysis from the model checking point of view. It turns out that modal logic allows concise specifications of data flow analysis problems, from which efficient data flow analysis algorithms can automatically be generated. This is illustrated by considering the partial redundancy elimination problem.

The paper by Mitchell deals with the theory of abstraction-preserving reductions between programming languages for comparing language expressiveness. An interesting result of the theory is that replacement of weak sums by strong sums is not abstraction-preserving. It is also shown that many languages are not reducible to Lisp even when it has FEXPR functions.

Finally, the paper by Nishizaki is devoted to an investigation of continuations in the framework of classical linear logic. An analogue of the CPS-translation is defined

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from a lambda calculus with continuation primitives into classical linear logic. As a result, deletion and duplication of continuations are made explicit.

We would like to thank Professor Ito for the excellent organization of the conference and the program committee of the conference for their help with the selection of the papers.