

PREFACE

This Special Issue of *Fundamenta Informaticae* contains a selection of papers presented at 16th International Symposium on Mathematical Foundations of Computer Science, MFCS'91, held in Kazimierz Dolny, Poland, during 9–13 September 1991.

The series of MFCS symposia, organized alternately in Poland and Czechoslovakia since 1972, has a long and well-established tradition. The purpose of the series is to encourage high-quality research in all branches of theoretical computer science and to bring together specialists working actively in the area. Throughout the years, MFCS has served this purpose well, and we hope it will do so in the future.

Principal areas of interest of the symposia include: software specification and development, parallel and distributed computing, semantics and logics of programs, algorithms, complexity and computability theory (this is not an exclusive list).

The scientific programme of MFCS'91 consisted of 5 invited lectures by distinguished scientists and 38 presentations selected, strictly on the basis of the scientific merit, by the Programme Committee out of the total 109 submitted papers. Over a hundred participants, a very high quality of the papers and of the overwhelming majority of the presentations, a number of memorable social events, and a wonderful atmosphere of Kazimierz, a charming small town picturesquely situated on the bank of Wisła, ensured the success of the symposium.

The proceedings of MFCS'91 have been published by Springer-Verlag as volume 520 of the Lecture Notes in Computer Science series. Unfortunately, due to the usual space limitations, the contributions in the proceedings are in much abridged form. To enable publication of selected papers in their full version under the MFCS'91 label, I have invited a number of authors to submit their papers to this Special Issue. I should stress that I did not intend to reflect all the areas covered by MFCS, nor even to include all the best papers of the symposium — this would never be possible within a single issue. The selection was based on my personal taste, and the topics of the invited papers are close to my scientific interest.

For a number of reasons (submissions elsewhere, strict deadlines I tried to impose, careful refereeing) this Special Issue includes only four papers:

- *Partial higher-order specifications* by Egidio Astesiano and Maura Cerioli. This paper, well in the tradition of algebraic specification, presents in detail how to specify higher-order functions that are allowed to be partial. The authors spell out all the surprisingly delicate and nontrivial issues arising when a novel algebraic formalism is to be established. This paper once more forced me to realise how difficult a combination of two well-known frameworks may be.
- *Towards a categorical semantics of type classes* by Barney Hilken and David Rydeheard. The work presented illustrates the invasion of category-theoretic methods in computer science. The authors use the machinery of indexed categories to model a very powerful type system by giving a precise account of type classes and comprehension schemata. At places tough reading, but very interesting.

- *Operational, denotational and logical descriptions: a case study* by Lavinia Egidi, Furio Honsell and Simona Ronchi della Rocca. The view that programming languages are just highly sugared λ -calculi has been commonly accepted and led to a lot of interesting research both on programming languages and on λ -calculus. The lazy call-by-value λ -calculus is used in this paper to illustrate many operational, denotational and logical issues arising in the study of λ -calculi. This is more than just a straightforward case study — there is much to learn here.
- *Dynamic congruence vs. progressing bisimulation for CCS* by Ugo Montanari and Vladimiro Sassone. In my view, in spite of a lot of important and deep research, concurrency remains one of the most challenging areas of theoretical computer science. This paper is based on the algebraic framework of Milner's CCS, which provides one of the most commonly accepted views of communicating processes. Apart from a specific new result, the equality of two important equivalences on processes, the paper displays a lot of background material and interesting remarks allowing the reader to taste some typical problems addressed and methods used in the area.

Let me use this opportunity to express once more my gratitude to the authors of all the submitted papers for their interest in MFCS'91 and for their valuable contribution, to the members of the MFCS'91 Programme Committee for the work they put into the careful evaluation of the papers, and to all the referees who reviewed the submissions to both MFCS'91 and this Special Issue. Very special thanks are due to the members of the Organizing Committee for their invaluable work in enabling the symposium to take place.

MFCS'91 was organized by the Institute of Computer Science of the Polish Academy of Sciences in cooperation with the Institute of Informatics of Warsaw University and the Polish Information Processing Society.

Warsaw, January 1992

Andrzej Tarlecki
Special Issue Editor