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Preface

The International Symposium on Symbolic and Algebraic Computation (ISSAC'2001), held at the University of Western Ontario, London, Canada in July 2001, has been the successful 26th meeting in a series of symposia in the domain. The present special issue collects 12 selected contributions (among 27 submissions received in November 2001) whose authors substantially extend ideas presented in London and published in a preliminary form in the proceedings of ISSAC.

These contributions reflect various fundamental aspects of the ongoing advances on algebraic and symbolic-numeric algorithms. We hope the reader will find an interesting snapshot of this rich and always promising area. We can give few introductory words on the content as follows. First of all, five papers give new algorithms or insights and discuss computational experiences on algebraic algorithms and their applications: for parallel coset enumeration (G. Cooperman and V. Grinberg); for the construction of sparse resultants, for example, in geometric modeling (C. D'Andrea and I. Emiris); for the classification of coupled integrable equations (M.V. Foursov and M. Moreno Maza); in system and control theory for testing local observability in polynomial time (A. Sedoglavic); for computing linear generators of matrix sequences especially in the block-Wiedemann algorithm (E. Thomé). Then four papers explore the field of numerical and semi-numerical algorithms and offer novel approaches for solving central problems. In the area of univariate polynomial root computing, the reader will find a new iterated eigenvalue algorithm (S. Fortune), and a nearly optimal method for numerical factorization (V. Y. Pan). On polynomial ideals and algebraic systems, a new semi-numerical algorithm for curve decomposition (A. Galligo and D. Rupprecht) and a generalization of Weierstrass's method for approximating roots of systems (B. Mourrain and O. Ruatta) are proposed. Finally three papers address fundamental algebraic questions and develop original solutions and algorithms: on normal forms for rational functions and decompositions of hypergeometric terms (S. A. Abramov and M. Petkovšek); on computing the radical of a polynomial ideal over a field of arbitrary characteristic (E. Fortuna, P. Gianni and B. Trager); on multivariate rational function decomposition over an arbitrary field (J. Gutierrez, R. Rubio and D. Sevilla).

Preparing this special issue has been possible only with the generous help of so many people. My warmest thanks again go to the authors of the papers submitted to ISSAC from 24 countries, and to those who have worked additionally for this special issue. It is a real pleasure to present their high-quality research. I am especially indebted to the goodwill and scientific help of about 230 referees contacted for ISSAC or for this issue. I would like to again gratefully acknowledge all the volunteers and professionals who have done a superb job in organizing and holding ISSAC, with the sponsorship of the Association for Computing Machinery (ACM), and its Special Interest Group on Symbolic and Algebraic Manipulation (SIGSAM), hosted by the Ontario Research Center for Computer Algebra (ORCCA).

My most sincere thanks also go to Hoon Hong as *Journal of Symbolic Computation* Editor-in-Chief and to Erich Kaltofen as ISSAC'2001 General Chair, who have offered me the chance to do this job.

Gilles Villard,
Program Chair, ISSAC 2001,
CNRS, Laboratoire LIP—ENS Lyon, France
E-mail: Gilles.Villard@ens-lyon.fr

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