Preface

This volume of the Springer Series "Lecture Notes in Computer Science" contains refereed papers which were presented at the Fifth International Conference on Numerical Methods and Applications, NMA 2002, held in Borovets, Bulgaria, during 20–24 August 2002. The NMA 2002 Conference was organized by the Central Laboratory for Parallel Processing at the Bulgarian Academy of Sciences in cooperation with SIAM (Society for Industrial and Applied Mathematics) and GAMM (Gesellschaft für Angewandte Mathematik und Mechanik). Co-organizers of this traditional scientific meeting were the Institute of Mathematics and Informatics at the Bulgarian Academy of Sciences and the Faculty of Mathematics and Informatics at the University of Sofia. The conference was devoted to the 70th anniversary of the distinguished Bulgarian mathematician academician Blagovest Sendov — the founder of the Bulgarian school in numerical analysis, the teacher of dozens of Ph.D. students, the author of more than 270 papers, textbooks, and monographs. He is the scholar who has been at the center of the mathematical life in Bulgaria for about 50 years. Over the years he headed the Bulgarian Academy of Sciences, the University of Sofia, the Faculty of Mathematics and Informatics of the University of Sofia, the Central Laboratory for Parallel Processing of the Bulgarian Academy of Sciences, the Department of Mathematical Modeling of the Institute of Mathematics and Informatics, the Union of Bulgarian Mathematicians, etc. He represented with distinction Bulgarian science in such world-recognized organizations as IFIP (International Federation for Information Processing), the International Association of Universities, the International Council of Scientific Unions, the Balkan Mathematical Union, etc. He has been the Editor-in-Chief of the journal "Mathematica Balkanica" for many years. Without his enormous pioneering work in the field of numerical analysis, this book would not have been completed and many of its papers would not have been written. His efforts and moral support have played an important role in the developments in numerical analysis and related fields in the last several decades in Bulgaria.

The conference follows the traditions of the first four conferences on Numerical Methods and Applications held in Sofia in 1984, 1988, 1994, and 1998 in providing possibilities for exchanging ideas between scientists who develop and study numerical methods and researchers and engineers who use them for solving real-life problems.

The subjects of the conference ranged from basic research to applications in physics, mechanics, engineering, environmental sciences, and other areas. Most of the presentations covered numerical methods based on the use of finite difference, finite element, and finite volume methods, boundary element methods, Monte Carlo methods, multigrid and domain decomposition, numerical linear algebra, parallel algorithms, numerical methods for nonlinear problems, com-

putational mechanics, large-scale modeling, and engineering applications. Five special minisymposia were also held at the conference:

- Monte Carlo and Quasi-Monte Carlo methods;
- numerical analysis of problems with blow-up solutions;
- robust iterative solution methods and applications;
- control and uncertain systems; and
- numerical methods for sensor data processing.

The selected papers in this volume contain a series of new mathematical tools, which will be useful for a wide community of specialists working on the development of efficient numerical methods and their application in science and engineering. The presented results will also be of special interest to university lecturers in the areas of numerical analysis and its applications in the solution of scientific and engineering problems.

The recent results in numerical analysis together with the increasing speed and expanded storage capacity of modern computers have greatly improved the ability to solve real-life computational problems. Many scientists recognize the impact of the new generation of computers today. Moreover, the new computers and the new computational techniques stimulate new research and solutions in the field of numerical analysis. On the other hand, the progress in numerical analysis is stimulating the creation of new and more efficient computational tools.

The Fifth International Conference on Numerical Methods and Applications and the present volume in particular are the outcome of the joint efforts of many colleagues from various institutions and organizations. First of all, we would like to thank all the members of the Program Committee for their valuable contribution towards forming the "scientific face" of the conference, as well as for their help in reviewing and editing the contributed papers. We would like to specially thank the organizers of the minisymposia: Aneta Karaivanova, Todor Gurov, Stefka Dimova, Rita Meyer-Spasche, Oleg Iliev, Maya Neytcheva, Svetoslav Markov, Mikhail Krastanov, Vladimir Veliov, Tzvetan Semerdjiev, and Herman Bruyninckx. The organizers of the minisymposia significantly contributed to the improved scientific level and the success of the conference.

Details regarding the conference are available on its home page: http://www.bas.bg/clpp/nma02.html.

Sofia, December 2002   Ivan Dimov
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