Modeling, Simulation and Optimization of Complex Processes

Hans Georg Bock • Hoang Xuan Phu
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Editors

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Preface

High Performance Scientific Computing is an interdisciplinary area that combines many fields such as mathematics and computer science as well as scientific and engineering applications. It is an enabling technology for both competitiveness in industrialized countries and for speeding up development in emerging countries. High performance scientific computing develops methods for modeling, computer-aided simulation, and optimization of systems and processes. In practical applications in industry and commerce, science and engineering, it helps to conserve resources, to avoid pollution, to reduce risks and costs, to improve product quality, to shorten development times, or simply to operate systems better. Topical aspects of scientific computing have been presented and discussed at the Fourth International Conference on High Performance Scientific Computing held at the Institute of Mathematics, Vietnam Academy of Science and Technology (VAST), March 2–6, 2009. The conference has been organized by the Institute of Mathematics of VAST, the Interdisciplinary Center for Scientific Computing (IWR) of the University of Heidelberg, and Ho Chi Minh City University of Technology.

More than 200 participants from countries all over the world attended the conference. The scientific program consisted of more than 140 talks, 10 of them were invited plenary lectures given by Robert E. Bixby (Houston), Olaf Deutschmann (Karlsruhe), Iain Duff (Chilton), Roland Eils (Heidelberg), László Lovász (Budapest), Peter Markowich (Cambridge & Vienna), Volker Mehrmann (Berlin), Alfio Quarteroni (Lausanne & Milan), Horst Simon (Berkeley), and Ya-xiang Yuan (Beijing).

Topics included mathematical modeling, numerical simulation, methods for optimization and control, parallel computing, software development, applications of scientific computing in physics, mechanics, hydrology, chemistry, biology, medicine, transport, logistics, site location, communication networks, scheduling, industry, business, and finance.

This proceedings volume contains 27 carefully selected contributions referring to lectures presented at the conference. We would like to thank all authors and the referees.

Special thanks go to the sponsors whose support significantly contributed to the success of the conference:

+ Heidelberg Graduate School of Mathematical and Computational Methods for the Sciences
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+ The International Council for Industrial and Applied Mathematics (ICIAM)
+ Berlin Mathematical School
+ Berlin/Brandenburg Academy of Sciences and Humanities
+ The Abdus Salam International Centre for Theoretical Physics, Trieste
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