Preface

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Biographical notes: Daniel S. Katz received his PhD in Electrical Engineering at Northwestern University, USA in 1994. He is a Senior Fellow at the Computation Institute, University of Chicago and Argonne National Laboratory, an Affiliate Faculty at the Center for Computational & Technology (CCT), Louisiana State University (LSU) and an Adjunct Associate Professor in Electrical and Computer Engineering, LSU. His research interests include applications on high performance, cluster, grid and cloud computers and fault tolerance.

The 2008 IEEE International Symposium on Parallel and Distributed Processing with Applications (ISPA 2008) was held in Sydney, Australia from 10–12 December 2008. The conference covered the areas of: computer networks; network routing and communication algorithms; parallel/distributed system architectures; tools and environments for software development; parallel/distributed algorithms; distributed systems and applications; wireless networks, mobile and pervasive computing; reliability, fault-tolerance and security; performance evaluation and measurements; grid and cluster computing; internet computing and web services; database applications and data mining; and high-performance scientific and engineering computing. 128 submissions were received from all over the world. All submissions were carefully peer-reviewed by at least three program committee members and/or external reviewers. The manuscripts were ranked according to their original contribution, quality, presentation and relevance to the themes of the conference. Finally, 42 papers were accepted for presentation and inclusion in the main proceedings, comprising a 33% acceptance rate. After the conference, the authors of six papers, specially chosen as the highest quality papers by the guest editor and the IPSA'08 program vice chairs, were invited to submit extended versions of their papers to this special issue. The submitted extended papers were then re-reviewed. The four papers that appear in this special issue are those that successfully made it through this entire process.

These four papers are quite diverse, and all use fairly different hardware. The first, 'Orchestrating computational algebra components into a high-performance parallel system' by A.D. Al Zain et al., uses a fairly conventional HPC platform for a somewhat non-traditional application, computational algebra. The next paper, 'A task parallel algorithm for finding all-pairs shortest paths using the GPU' by T. Okuyama et al., solves a graph-based problem on a GPU, a system found in an increasing number of HPC systems and almost all desktop systems. The third paper, 'Simulation-based evaluation of the Imagine stream processor with scientific programs' by Y. Che et al.,

examines a number of issues that are important in how scientific applications will run on an Imagine stream processor, an uncommon but very interesting component that will likely at least influence general HPC systems in the future. And finally, the last paper, 'Long-term microclimate monitoring in wildland cultural heritage sites with wireless sensor networks' by M. Xia et al., examines new applications that monitor very local climates using sensor networks, which are being increasingly integrated into common systems. All of these papers represent the key elements of the ISPA conference series, examining how both current and novel applications can work with both current and novel parallel and distributed hardware.

I want to thank the authors of these four papers for working with me to get to this point, almost 18 months after the conference, and about two years after the initial conference paper submissions. Additionally, I want to thank a number of individuals from the conference: all the authors who submitted papers initially; the ISPA steering chairs, Minyi Gue and Laurence T. Yang; the ISPA'08 general chair, Albert Zomaya; my ISPA'08 co-program chair and good friend, Mark Baker; the ISPA'08 program vice chairs: Paul Coddington (University of Adelaide), algorithms and applications; Keith Underwood (Intel), architectures; Hidemoto Nakada (AIST), middleware; Hong Ong (MIMOS Berhad), networks and communications; Stephen Jarvis (University of Warwick), performance and simulation; Richard Sinnott (University of Melbourne), security; and the ISPA'08 Program Committee members and reviewers who have put in hard work and the long hours to make high-quality reviews in a timely and professional way under a tight schedule, and who also re-reviewed the extended versions of papers for this special issue.