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Proceedings

Volume Editors

Hai Jin

Huazhong University of Science and Technology
School of Computer Science and Technology, Wuhan, 430074, China
E-mail: hjin@hust.edu.cn

Omer F. Rana

Cardiff University
School of Computer eScience and Welsh Science Center
5 The Parade, Cardiff CF24 3AA, UK
E-mail: o.f.rana@cs.cardiff.ac.uk

Yi Pan

Georgia State University
Computer Science Department
34 Peachtree Street, Suite 1450, Atlanta, GA 30302-4110, USA
E-mail: pan@cs.gsu.edu

Viktor K. Prasanna

University of Southern California
Ming Hsieh Department of Electrical Engineering
Los Angeles, CA 90089-2562, USA
E-mail: prasanna@usc.edu

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Preface

Parallel and distributed computing in the 1980s and 1990s had great influence on application development in science, engineering and business computing. The improvements in computation and communication capabilities have enabled the creation of demanding applications in critical domains such as the environment, health, aerospace, and other areas of science and technology. Similarly, new classes of applications are enabled by the availability of heterogeneous large-scale distributed systems which are becoming available nowadays (based on technologies such as grid and peer-to-peer systems). Parallel computing systems exploit a large diversity of computer architectures, from supercomputers, shared-memory or distributed-memory multi processors, to local networks and clusters of personal computers.

With the recent emergence of multi core architectures, parallel computing is now set to achieve “mainstream” status. Approaches that have been advocated by parallel computing researchers in the past are now being utilized in a number of software libraries and hardware systems that are available for everyday use. Parallel computing ideas have also come to dominate areas such as multi user gaming (especially in the development of gaming engines based on “cell” architectures) – often ignored by many “serious” researchers in the past, but which now are set to have a growing user base of tens of millions across the world. In recent years, focus has also shifted to support energy efficiency in computation, with some researchers proposing a new metric of performance based on Flops/Watt.

Another topic that has gained significant importance is work within distributed and wireless sensor networks – which provide the capability of data capture, along with actuation support in some instances. Grid computing has dominated much work being undertaken within parallel and distributed systems in recent years. The ability to group regional and national-scale resources to create computational infrastructure for grand-challenge problems has now been demonstrated effectively in Europe, the United States and in China. Grid computing research continues to play an active part in bringing together computational science and parallel computing communities.

ICA3PP is a premier conference series that brings together researchers and practitioners from academia, industry and governments around the world to advance the theories and technologies of parallel and distributed computing. Previous ICA3PP conferences have been successfully organized in Brisbane (1995), Singapore (1996), Melbourne (1997, 2005), Hong Kong (2000), and Beijing (2002).

ICA3PP 2007 featured a number of papers that address these themes, and selected papers for the conference also provide an insight into many emerging themes that have become important in parallel and distributed systems laboratories and groups around the world over recent years.

ICA3PP 2007 was hosted in one of the most beautiful cities in the world, in Hangzhou – the capital of Zhejiang province in China. Hangzhou is known for its natural beauty and provides an atmosphere fostering creativity. We believe the conference in this city will encourage dialogue and interaction between world leaders in parallel and high-performance computing, and encourage greater collaboration between the researchers who attended the conference.

In total, the conference received 176 papers from researchers and practitioners from 9 countries. Each paper was reviewed by at least three internationally renowned referees, and selection was based on originality, significance, correctness, relevance, and clarity of presentation. Some of the papers were subsequently further reviewed by the Program Chairs to assess quality and relevance. From the submissions received, 40 papers were selected. All of the selected papers are included in the proceedings. To encourage and promote the work presented at ICA3PP 2007, we are delighted to inform the authors that some of the papers will be accepted in special issues of *Parallel Computing*, *Computer Communication*, *Journal of Supercomputing*, and *IJHPCN*. All of these journals have played a prominent role in promoting the development and use of parallel and high-performance computing and networking.

We are also delighted to have been able to host well-known international scholars, Reiner Hartenstein from the Computer Science Department, Kaiserslautern University of Technology, Germany, and Hai Zhuge from the Institute of Computing Technology, Chinese Academic of Science, China, who delivered the keynote speeches.

We would like to take this opportunity to thank all the authors for their submissions to the conference. Many of them traveled a considerable distance to participate in the conference. We also thank the Program Committee members and additional reviewers for their efforts in reviewing the large number of papers. Thanks also go to the local conference organizers for their great support.

Last but not least, we would like to express our gratitude to all of the organizations that supported our efforts to bring the conference to fruition. We are grateful to Springer for publishing the proceedings this year. Special thanks go to Wanlei Zhou (from Deakin University, Australia) and Yi Pan (Georgia State University, USA). Their guidance, hard work and support made ICA3PP 2007 possible. We are also grateful to Michael Hobbs (Deakin University), who served as Co-chair in 2005 and provided support for this event.

March 2007

Hai Jin
Omer Rana

Organization

The ICA3PP 07 conference was organized by the Cluster and Grid Computing Lab, Huazhong University of Science and Technology, and undertaken by Hangzhou Dianzi University. It was held in cooperation with *Lecture Notes in Computer Science* (LNCS) of Springer.

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