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## Preface

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**Biographical notes:** Fatos Xhafa received his PhD in Computer Science from the Technical University of Catalonia (Barcelona, Spain) in 1998. He joined the Department of Languages and Informatics Systems of the Technical University of Catalonia as an Assistant Professor in 1996 and is currently an Associate Professor and a member of the ALBCOM Research Group of this department. His current research interests include parallel algorithms, combinatorial optimisation, approximation and metaheuristics, distributed programming, grid and P2P computing. His research is supported by several research projects from Spain, the European Union and NSF/USA. He has been published in leading international journals and conferences and has served in the Organising Committees of many conferences and workshops.

Runhe Huang received her BSc in Electronics Technology from the National University of Defence Technology, China, in 1982 and her PhD in Computer Science and Mathematics from the University of the West of England, UK, in 1993. She worked at the National University of Defence Technology as a Lecturer during the period of 1982–1988. In 1988, she received a Sino-Britain Friendship Scholarship for her PhD study in the UK. She was working in the Computer Science and Engineering Laboratory of the University of Aizu for seven years. She is now a professor at Hosei University. Her research fields include computer-supported collaboration working, artificial intelligent applications, multimedia and distributed processing, ubiquitous and mobile computing.

Hai Jin is a Professor of Computer Science and Engineering at the Huazhong University of Science and Technology (HUST) in China. He is now the Dean of the School of Computer Science and Technology at HUST. Jin received his PhD in Computer Engineering from HUST in 1994. In 1996, he was awarded a German Academic Exchange Service fellowship to visit the Technical University of Chemnitz in Germany. Jin worked at the University of Hong Kong between 1998 and 2000 and as a Visiting Scholar at the University of Southern California between 1999 and 2000. He was awarded the Excellent

Youth Award from the National Science Foundation of China in 2001. Jin is a Chief Scientist of ChinaGrid, the largest grid computing project in China. Jin is a senior member of the IEEE and a member of the ACM. Jin is the member of the Grid Forum Steering Group (GFSG). He has co-authored 15 books and published over 300 research papers. His research interests include computer architecture, virtualisation technology, cluster computing and grid computing, peer-to-peer computing, network storage and network security.

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Web, grid and P2P computing technologies have emerged as new paradigms for solving complex problems by enabling the large-scale aggregation and sharing of computational data and other geographically distributed resources. Rapid advances are being reported by many researchers and forums with regard to understanding numerous issues and challenges in such paradigms, from the theoretic to the application aspects. Moreover, the continuous development of the internet and the construction of new P2P and grid infrastructures and middleware are making possible the development of large-scale real-life applications.

The research topics related to web, grid and P2P computing are recent and require the investigation of many issues, such as the effective harnessing of internet-connected resources and the development of new methods and techniques, which present nowadays real challenges to the development of large distributed systems and applications.

This special issue follows the *21st IEEE International Conference on Advanced Information Networking and Applications (AINA2007)*<sup>1</sup>, held at Niagara Falls from 21–23 May 2007.

The special issue comprises eight papers carefully selected based on their originality, significance, technical soundness and clarity of exposition. The special issue brings advances – from theory and practice – in web, grid and P2P computing, as well as states problems and new research challenges to be focused on by the research community in the near future. Papers were selected with the aim to give some of the most up-to-date achievements on web, grid and P2P computing and their practical relevance for the researchers of the field. The papers in this special issue are organised as follows. The first three papers present the approaches for P2P and grid computing systems; the fourth, fifth and sixth papers address the issues from web-based computing and the last two ones are related to parallel data compression and spam filtering techniques, respectively.

In the first paper, Aikebaier *et al.* ('A distributed coordination protocol in an order-heterogeneous group'), present an approach for a distributed coordination protocol among multiple values in a type of heterogeneous system where every pair of processes have different precedent relations on the same domain. Each process learns a part of the precedent relation of another process through exchanging values and storing them in a local database.

Sato ('The estimation of trustworthiness for P2P systems in a collusive attack'), in the second paper, introduces the evaluation of the trustworthiness of the peer for safe communications. While in existing methods the trustworthiness is computed based on the reputation feedback of the peer, the author proposes a new estimation method in consideration of a collusive rate of the peer.

In the third paper, Quan and Altmann, ('A recovery mechanism for errors caused by a late subjob in a system handling SLA-based grid workflows') propose an error recovery mechanism for supporting Service Level Agreements (SLAs) for grid-based workflows.

By using the proposed approach, the subjob failure in a workflow can be handled. The error recovery mechanism works in phases and in each phase, a dedicated algorithm to remap the subjobs of the workflow to the resources is used.

Shtykh and Jin ('Harnessing user contributions and dynamic profiling to better satisfy individual information search needs'), in the fourth paper, present a collaborative personalised search approach for improving the quality of web information retrieval aiming to better satisfy the information needs of searching users. The proposed web information retrieval framework called Better Search and Sharing (BESS) captures the user-system interactions and profiles and induces personal interests that change over time.

In the fifth paper, Koyama *et al.* ('Design, field experiments and evaluation of a web-based remote medical care support system') propose a remote medical care system for supporting nurses, care managers and care helpers during their work. In order to achieve this objective, the proposed system has several features such as multipoint communication using video images and voice, vital signs data auto-uploading and referring and drip infusion monitoring. The performance of the proposed approach is conducted through real experimentation in a medical care support centre.

The sixth paper by Ishida *et al.*, 'A tele-immersion environment for a traditional Japanese crafting system over the Japan gigabit network', deals with the development of a tele-immersion environment for a traditional Japanese crafting system, which uses a highly immersive system based on a virtual reality environment such as multiple CAVEs; the ultrahigh-speed network (Japan Gigabit Network 2) is used as an interconnection infrastructure. A prototype of the system is constructed and its usefulness is verified through the evaluation.

In the seventh paper, Gilchrist and Cuhadar ('Parallel lossless data compression using the Burrows-Wheeler transform') present parallel algorithms for lossless data compression based on the Burrows-Wheeler Transform technique. Data parallelism and task parallelism are used for the performance evaluation of both multithreaded and message-passing programming. A new scheduling strategy is developed to balance the workload among the processors. An extensive experiment is performed to evaluate the performance of the proposed parallel algorithms.

Richard and Doncescu in ('Spam filtering using the Kolmogorov complexity analysis'), in the eighth paper, address a spam filtering technique using the Kolmogorov complexity analysis. The authors use the Kolmogorov complexity to give formal meaning to the notion of 'information content' and to provide a measure of this content. In the validation phase, the authors proceed in two steps: in the first one, they apply the classical compression distance and in the second, a k-nearest neighbours algorithm is used.

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**Note**

1 <http://www.aina-conference.org/2007/>