

# Foreword

## Guest Editors: Kuan-Ching Li

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**Biographical notes:** Kuan-Ching Li received his PhD and MS degrees in EE and BA in Mathematics from the University of São Paulo, Brazil in 2001, 1996 and 1994, respectively. After he received his PhD degree, he had been a post-doctoral scholar in the Department of Electrical Engineering and Computer Science, University of California at Irvine, USA, under the supervision of Dr. Jean-Luc Gaudiot. Professor Li is currently Assistant Professor in the Department of Computer Science and Information Management and Director of Parallel and Distributed Processing Center at Providence University, Taiwan. He has served on the programme and organising committees of various international conferences and workshops. He is also the Technical Editor for ANSInet's *Information Technology Journal* and IT Father. His research interests include high-performance computing, cluster and grid computing, computational biology, and performance evaluation. He has published over 50 journal and conference papers. His researches have been sponsored by Taiwan agencies NSC, NCHC and MOE, as well as industrial organisation.

Jean-Luc Gaudiot received the Diplôme d'Ingénieur from the École Supérieure d'Ingénieurs en Electronique et Electrotechnique, Paris, France in 1976 and a MS and PhD in Computer Science from the University of California, in 1977 and 1982, respectively. He has been a Professor in the Electrical Engineering and Computer Science Department at the University of California, Irvine since 2002 prior to which he was Professor of Electrical Engineering at the University of Southern California since 1982, where he also served as Director of the Computer Engineering Division for three years. He frequently acts as consultant to companies that design high-performance computer architectures, and has served as an expert witness in patent infringement cases. His research interests include multithreaded architectures, fault-tolerant multiprocessors, and implementation of reconfigurable architectures. He has published over 150 journal and conference papers. NSF, DoE, and DARPA, as well as a number of industrial organisations have sponsored his research.

Welcome to this special issue on 'Applications for high-performance systems' of the *International Journal of Computer Applications in Technology*. Our goal has been to gather reports on the state-of-the-art in current and future applications for high-performance systems, including:

- bioinformatics and genomics
- computational finance
- databases and data mining
- drug discovery
- engineering, including aeronautical, molecular and material e-business and e-commerce support
- global climate modelling and prediction
- integrated circuit chip design
- image processing and computer graphics
- medicine

- natural disaster forecast
- stock market modelling and prediction
- virtual reality
- web search engines.

As it turned out, we were quite successful in that we received no less than 27 submissions from nine countries, Brazil, France, Japan, Jordan, Malaysia, PR China, Taiwan, UK and USA. We had the arduous tasks of selecting no more than five papers out of this otherwise outstanding set of manuscripts. To this end, we implemented a strict peer review process, where no paper received less than five reviews and the two co-guest editors carefully examined the reviews. As a result, we are proud to present to you the following five papers:

- 1 Chao-Tung Yang, Yu-Lun Kuo, and Chuan-Lin Lai, in 'Designing computing platform for BioGrid', have proposed and evaluated a grid computing environment for bioinformatics applications. They have based it on multiple Linux PC clusters, using the globus toolkit (GT) and the SUN grid engine (SGE).
- 2 Hsun-Chang Chang, Po-Shun Yu, Tze-Wei Huang, Frang-Rong Hsu, and Yaw-Ling Lin, propose new methods of obtaining models from splicing graphs and accordingly formulate linear programming models to obtain quantitative distributions of the various alternative splicing forms in their paper entitled 'The application of alternative splicing graphs in quantitative analysis of alternative splicing form from EST database'.
- 3 Isabel H. Mansour, Luiz Gustavo Fernandes, Carla M.D.S. Freitas, Gustavo Serra, and Thiago Nunes have presented a novel strategy for the visualisation of inner structures in medical volume data in their paper 'A high-performance approach for inner structures visualisation in medical data'.
- 4 Yueh-Min Huang and Shu-Chen Cheng have authored 'Parallel medical image analysis for diabetic diagnosis' in which they present the result of their investigation of the characteristics of medical images with the ultimate goal of facilitating diagnostic schemes and developing quantitative indexes of diabetes.
- 5 Zhengtao Cui, Baxter E. Vieux, and Henry Neeman focus on distributed hydrologic models in 'Parallelisation of a distributed hydrologic model'. They describe the parallel DHM software system they

have developed and analyse it in terms of efficiency and scalability, load balancing, interprocessor performance, and disk performance.

We trust you will find these papers useful to your own future work. Please join us in thanking the Guest-Editorial Board who, through their hard work, made it all possible:

- Chiou-Nan Chen, National Tsing-Hua University, Taiwan
- Guang R. Gao, University of Delaware, USA
- Hsiao-Hsi Wang, Providence University, Taiwan
- Joao Jose Neto, University of Sao Paulo, Brazil
- Jose Moreira, IBM Research, USA
- Jose Nelson Amaral, University of Alberta, Canada
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- Sajal Das, University of Texas at Arlington, USA
- Siang Wun Song, University of Sao Paulo, Brazil
- Stephen Jenks, University of California at Irvine, USA
- Teofilo Gonzalez, University of California at Santa Barbara, USA
- Wu-Lin Chen, Providence University, Taiwan

Also, we would like to warmly thank Dr. Hsiao-Hsi Wang for his invaluable assistance during the selection process.