Special Issue on Parallel Architecture, Algorithms and Programming

Guest Editorial

The quest for using parallelism to enhance the performance of computing and computing systems is one of the most challenging but also rewarding fields of research in computer science. The parallel computing and related architecture, algorithms and programming technique play a key role in shaping future research and development activities in both academia and industry. In recent years, more and more researchers have recognized the fact that parallel architectures, algorithms and programming play an important role in improving the efficiency of computing systems, and hence continuously present their valuable research results in this field.

This special issue comprising of six papers is focused on the various aspects of parallel computing and its applications. All of them are excellent papers selected from the proceedings of the fourth International Symposium on Parallel Architectures, Algorithms and Programming (PAAP 2011), which was held in Tianjin, China, December 5-7, 2011. The conference series on Parallel Architectures, Algorithms and Programming (PAAP) has been the premier forum and meeting point for researchers and practitioners from academia and industry for presenting and discussing leading edge parallel systems research since its first edition in 2003 as celebration of the 50th anniversary of the University of Science and Technology of China and Academician Guoliang Chen’s 70th birthday. The ensuing conferences then took place in Nanning and Dalian in 2009 and 2010 respectively. Papers were selected on the basis of fundamental ideas/concepts rather than the thoroughness of techniques deployed. The papers are organized as follows.

The paper titled "A Parallel Clustering Algorithm with MPI –MKmeans” presents a proposed a parallel K-means algorithm based on MPI (called MKmeans) which enables applying the clustering algorithm effectively in the parallel environment.

The paper titled “An ID-Based Certified E-mail protocol with STTP Suitable for wireless mobile environments” proposes an improved identity-based signcryption with re-encryption scheme and a novel certified e-mail protocol in wireless resources-constrained networks.

The paper titled “Using A Runtime to Overcome The Pathologies in Hardware Transactional Memory Systems” analyses the advantages and disadvantages of existing conflict management and version management schemes and two pathologies are found stemmed from the interplay between the conflict management and version management that may impact thread level parallelism significantly.

The paper titled “Deadlock-free Routing Scheme for Irregular Mesh Topology NoCs with Oversized Regions” proposes a hybrid scheme multiphase routing algorithm for irregular mesh integrating oversized rectangle modules which is applicable to the application-specific NoC systems with a few oversized components.

The paper titled “A TTA-like Processor for Fast RSA Key Generation Using RNS” presents a cipher processor based on Transport Triggered Architecture (TTA) to realize the parallelism at the architecture level, and is shown that a high performance and small area for RSA key pair generation can be achieved.

The paper titled “Iris Recognition Using Stable Dark Features” presents a novel approach in which stable dark regions and a Gabor-based model are employed to identify stable features in iris images, and the superior performance recognition can be achieved.

It has been a great pleasure to run this special issue, which reveals important research results in the field of parallel algorithms, scheduling and architectures. We would like to thank Prof. Prabhat Mahanti, Editor-in-Chief of Journal of Computers, and Dr. George J. Sun, Executive Editor of Academy Publisher, for giving us the opportunity to organize this special issue and for their great help in the organization of this issue. We thank all authors for their submissions and all reviewers for their diligent work in evaluating these submissions. We sincerely hope that you enjoy reading these distinguished papers.

Guest Editors:

Jigang Wu, School of Computer Science and Software Engineering, Tianjin Polytechnic University, China
Email: asjgwu@gmail.com

Guozhi Song, School of Computer Science and Software Engineering, Tianjin Polytechnic University, China
Email: guozhi.song@ieee.org
Jigang Wu received the PhD degree in Computer Software and Theory from University of Science and Technology China. He then worked with the Centre for High Performance Embedded System at Nanyang Technological University, Singapore, as a Research Fellow for many years. He is currently a Professor and Dean in the Department of Networks of School of Computer Science and Software at Tianjin Polytechnic University in China. Prof. Wu serves as General Chair, PC Chair, and PC Member of numerous conferences. He has published over 100 papers. His research interests are in the areas of grid computing, parallel computing and embedded system.

Guozhi Song received the BEng degree in Computer Science and Technology from Harbin Institute of Technology, and both his MSc and PhD degrees from the School of Electronic Engineering and Computer Science at Queen Mary, University of London. He is currently a Lecturer with the Department of Networks of the School of Computer Science and Software Engineering at Tianjin Polytechnic University in China. He is on the Editorial Board of several international journals. He serves as PC Chair, Workshop Chair, Publication Chair, or PC Member of a number of conferences. He is also the Guest Editor of several journal special issues. Dr. Song has (co-)authored one book and over 20 scientific papers. His research interests are in the areas of next generation wireless networks, teletraffic engineering and queueing theory. He is a member of IEEE and IEEE Communication Society.