

**PROCEEDINGS OF
THE 2014 INTERNATIONAL CONFERENCE ON
PARALLEL AND DISTRIBUTED PROCESSING TECHNIQUES AND
APPLICATIONS**

PDPTA 2014

Volume II

Editors

**Hamid R. Arabnia
Lou D'Alotto, Hiroshi Ishii, Minoru Ito
Kazuki Joe, Hiroaki Nishikawa
Georgios Sirakoulis, William Spataro
Giuseppe A. Trunfio**

Associate Editors

**George A. Gravvanis, George Jandieri
Ashu M. G. Solo, Fernando G. Tinetti**



WORLD COMP'14

July 21-24, 2014

Las Vegas Nevada, USA

www.world-academy-of-science.org

©CSREA Press

This set of volumes contain papers presented at The 2014 International Conference on Parallel and Distributed Processing Techniques and Applications (PDPTA'14). Their inclusion in this publication does not necessarily constitute endorsements by editors or by the publisher.

Copyright and Reprint Permission

Copying without a fee is permitted provided that the copies are not made or distributed for direct commercial advantage, and credit to source is given. Abstracting is permitted with credit to the source. Please contact the publisher for other copying, reprint, or republication permission.

Copyright © 2014 CSREA Press
ISBN: 1-60132-282-8, 1-60132-283-6 (1-60132-284-4)
Printed in the United States of America

CSREA Press
U. S. A.

Foreword

It gives us great pleasure to introduce this collection of papers to be presented at the 2014 International Conference on Parallel and Distributed Processing Techniques and Applications (PDPTA'14), July 21-24, 2014, at Monte Carlo Resort, Las Vegas, USA.

An important mission of the World Congress in Computer Science, Computer Engineering, and Applied Computing (a federated congress to which this conference is affiliated with) includes *"Providing a unique platform for a diverse community of constituents composed of scholars, researchers, developers, educators, and practitioners. The Congress makes concerted effort to reach out to participants affiliated with diverse entities (such as: universities, institutions, corporations, government agencies, and research centers/labs) from all over the world. The congress also attempts to connect participants from institutions that have **teaching** as their main mission with those who are affiliated with institutions that have **research** as their main mission. The congress uses a quota system to achieve its institution and geography diversity objectives."* By any definition of diversity, this congress is among the most diverse scientific meeting in USA. We are proud to report that this federated congress has authors and participants from 78 different nations representing variety of personal and scientific experiences that arise from differences in culture and values. As can be seen (see below), the program committee of this conference as well as the program committee of all other tracks of the federated congress are as diverse as its authors and participants.

The program committee would like to thank all those who submitted papers for consideration. About 57% of the submissions were from outside the United States. Each submitted paper was peer-reviewed by two experts in the field for originality, significance, clarity, impact, and soundness. In cases of contradictory recommendations, a member of the conference program committee was charged to make the final decision; often, this involved seeking help from additional referees. In addition, papers whose authors included a member of the conference program committee were evaluated using the double-blinded review process. One exception to the above evaluation process was for papers that were submitted directly to chairs/organizers of pre-approved sessions/workshops; in these cases, the chairs/organizers were responsible for the evaluation of such submissions. The overall paper acceptance rate for regular papers was 28; 12% of the remaining papers were accepted as poster papers (at the time of this writing, we had not yet received the acceptance rate for a few individual tracks.)

We are very grateful to the many colleagues who offered their services in organizing the conference. In particular, we would like to thank the members of the Program Committee of PDPTA'14, members of the congress Steering Committee, and members of the committees of federated congress tracks that have topics within the scope of PDPTA. Many individuals listed below, will be requested after the conference to provide their expertise and services for selecting papers for publication (extended versions) in journal special issues as well as for publication in a set of research books (to be prepared for publishers including: Springer, Elsevier, BMC, and others).

- *Prof. Afrand Agah (ABDA); Assistant Chair & Graduate Coordinator, Department of Computer Science, West Chester University of Pennsylvania, West Chester, Pennsylvania, USA*
- *Dr. Selim Aissi (Congress Steering Committee); Vice President, Global Information Security, Visa Inc., USA (formerly: Chief Strategist - Security, Intel Corporation, USA)*
- *Prof. Rafeeq AbdulRahman Al-Hashemi; Dean of Information Technology, Al-Hussein Bin Talal University, Jordan*
- *Prof. Nizar Al-Holou (Congress Steering Committee); Professor and Chair, Electrical and Computer Engineering Department; Vice Chair, IEEE/SEM-Computer Chapter; University of Detroit Mercy, Detroit, Michigan, USA*
- *Prof. Hamid R. Arabnia (Congress Steering Committee; Co-Editor); Professor of Computer Science; The University of Georgia, Graduate Studies Research Center, Athens, Georgia, USA; Editor-in-Chief, Journal of Supercomputing (Springer); Editor-in-Chief, Emerging Trends in CS and Applied Computing (Elsevier); Editor-in-Chief, Transactions of Computational Science & Computational Intelligence (Springer); Elected Fellow, Int'l Soc. of Intelligent Biological Medicine (ISIBM); USA*

- Prof. Ezendu Ariwa; Faculty of Computer Science and Technology, University of Bedfordshire, UK; Chair, IEEE Consumer Electronics & Broadcast Technology Chapter, UKRI; Chair, IEEE Technology Management Council Chapter, UKRI, UK
- Prof. Mehran Asadi (ICAI); Interim Chair and Associate Professor of Information Technology, Department of Business and Entrepreneurial Studies, The Lincoln University, Pennsylvania, USA
- Mehdi Bahrani; IEEE Senior Member, Senior Software Analyst and Software Manager, Lian Processor Co.; Cloud Lab, Electrical Engineering and Computer Science Department (EECS), University of California, Merced, USA; BISC member, University of California, Berkeley, California, USA
- Prof. P. Balasubramanian; Alliance University, Bangalore, India
- Prof. Michael Panayiotis Bekakos (Congress Steering Committee); Professor of Computer Systems; Director, Laboratory of Digital Systems, Department of Electrical and Computer Engineering, Democritus University of Thrace, Greece; Head, Parallel Algorithms and architectures Research Group (PAaRG); Editor-in-Chief, The Journal of Neural, Parallel & Scientific Computations, USA
- Dr. Sidahmed Benabderrahmane; INRIA (French National Computer Science Institute), France
- Prof. Juan-Vicente Capella-Hernandez; Executive and Quality Manager, Wireless Sensor Networks Valencia, Inc.; Member, Editorial Board: IEEE RITA Journal; International Journal On Advances in Networks and Services; International Journal of Computer Science & Information Technology Applications; Universitat Politècnica de Valencia, Valencia, Spain
- Prof. Juan Jose Martinez Castillo; Director of The Acantelys Research Group and Coordinator of the Computer Engineering Department, Universidad Gran Mariscal de Ayacucho, Venezuela
- Dr. Daniel Bo-Wei Chen; Department of Electrical Engineering, Princeton University, New Jersey, USA
- Dr. Xin Chen (ICOMP); Research Corporation of the University of Hawaii / Institute for Astronomy, Honolulu, Hawaii, USA
- Dr. Lou D'Alotto (Session Organizer/Chair & Co-Editor); York College, City University of New York (CUNY), New York, USA
- Prof. Kevin Daimi (Congress Steering Committee); Director, Computer Science and Software Engineering Programs, Department of Mathematics, Computer Science and Software Engineering, University of Detroit Mercy, Detroit, Michigan, USA
- Somdip Dey; School of Computer Science, The University of Manchester, Manchester, UK
- Dr. Lamia Atma Djoudi; Synchrone Technologies, France
- Prof. Mary Mehrnoosh Eshaghian-Wilner (Congress Steering Committee); Professor of Engineering Practice, University of Southern California, California, USA; Adjunct Professor, Electrical Engineering, University of California Los Angeles, Los Angeles (UCLA), California, USA
- Prof. Oleg Finko; Krasnodar Higher Military Command Engineering School Rocket Forces, Russia; Institute of Information Technology and security, Kuban State Technological University, Russia
- Dr. George A. Gravvanis (Assoc. Co-Editor); Democritus University of Thrace, Greece
- Prof. Mohammad Shahadat Hossain; Department of Computer Science and Engineering, University of Chittagong, Chittagong, Bangladesh; Visiting Professor, Trisakti University, Indonesia; Visiting Academic Staff, The University of Manchester, UK
- Dr. Guofeng Hou (ESA); Bell Laboratories and Microsoft Corporation, USA
- Prof. Hiroshi Ishii (Session Organizer/Chair & Co-Editor); Department Chair, Tokai University, Minato, Tokyo, Japan
- Prof. Minoru Ito (Session Organizer/Chair & Co-Editor); Nara Institute of Science and Technology, Japan
- Professor Emeritus Takayasu Ito (FCS); Tohoku University, Graduate School of Information Sciences, Tohoku University, Aoba-ku, Sendai, Japan; Author of "Constructive Logics for Program Correctness" and "Mathematical Theory of Programs" books
- Prof. George Jandieri (Congress Steering Committee & Vice Chair of CSC; Assoc. Co-Editor); Georgian Technical University, Tbilisi, Georgia; Chief Scientist, The Institute of Cybernetics, Georgian Academy of Science, Georgia; Editorial Board Member: International Journal of Microwaves and Optical Technology, The Open Atmospheric Science Journal, American Journal of Remote Sensing
- Prof. Young-Sik Jeong (Congress Steering Committee); Department of Multimedia Engineering, Dongguk University, Seoul, South Korea; Editor-in-Chief, Journal of Information Processing Systems (JIPS)
- Prof. Kazuki Joe (Session Organizer/Chair & Co-Editor); Department of Information and Computer Sciences, Nara Women's University, Japan
- Dr. Christos Kartsaklis; Oak Ridge National Laboratory, Oak Ridge, Tennessee, USA
- Prof. Byung-Gyu Kim (Congress Steering Committee); Multimedia Processing Communications Lab.(MPCL), Department of Computer Science and Engineering, College of Engineering, SunMoon University, South Korea
- Prof. Dattatraya V. Kodavade (Congress Steering Committee); Head of Computer Science and Engineering, D.K.T.E Society's Textile & Engineering Institute, Ichalkaranji, Maharashtra State, India

- *Dr. Vitus S. W. Lam (SERP); Information Technology Services, The University of Hong Kong, Hong Kong; Chartered Member of the British Computer Society; Editor, International Journal of Latest Trends in Software Engineering; Associate Editor, INFOCOMP Journal of Computer Science*
- *Prof. George Markowsky (Congress Steering Committee); Professor and Associate Director, School of Computing and Information Science; Chair International Advisory Board of IEEE IDAACS; Director 2013 Northeast Collegiate Cyber Defense Competition; Chair Bangor Foreign Policy Forum; President Phi Beta Kappa Delta Chapter of Maine; Cooperating Prof. Mathematics & Statistics Department UMaine; Cooperating Prof. School of Policy & Int'l Affairs UMaine; University of Maine, Orono, Maine, USA*
- *Dr. Andrew Marsh (Congress Steering Committee); CEO, HoIP Telecom Ltd (Healthcare over Internet Protocol), UK; Secretary General of World Academy of BioMedical Sciences and Technologies (WABT) a UNESCO NGO, The United Nations*
- *Dr. Kamal Mehta; Department of Computer Engineering, Institute of Technology, Nirma University, Ahmedabad, India; Vice Editor-in-Chief, International Journal of Innovative Science & Modern Engineering*
- *Prof. Robert Morelos-Zaragoza (ICWN); Electrical Engineering Department, San Jose State University, San Jose, California, USA; Senior Member, IEEE; Author of book "The Art of Error Correcting Coding" (2nd edition, John Wiley and Sons), USA*
- *Dr. Francesc D. Munoz-Escoi; Leader, Distributed Systems Group, Associate Professor, Instituto Tecnológico de Informática, Universidad Politécnica de Valencia (UPV), Spain*
- *Prof. Hiroaki Nishikawa (Session Organizer/Chair & Co-Editor); University of Tsukuba, Ibaraki, Japan*
- *Prof. G. N. Pandey (Congress Steering Committee); Vice-Chancellor, Arunachal University of Studies, Arunachal Pradesh, India; Adjunct Professor, Indian Institute of Information Technology, Allahabad, India*
- *Prof. James J. (Jong Hyuk) Park (Congress Steering Committee); Department of Computer Science and Engineering (DCSE), SeoulTech, Korea; President, FTRA, Editor-in-Chief, HCIS Springer, JoC, IJITCC; Head of DCSE, SeoulTech, Korea*
- *Prof. R. Ponalagusamy; Department of Mathematics, National Institute of Technology, Tiruchirappalli, India; Editor-in-Chief, International Journal of Mathematics and Engineering with Computers*
- *Dr. Xinyu Que; IBM T. J. Watson Research Center, Yorktown Heights, New York, USA*
- *Dr. Atta ur Rehman; Department of Information System, University of Malaya, Kuala Lumpur, Malaysia*
- *Dr. Georgios Sirakoulis (Session Organizer/Chair & Co-Editor); Democritus University of Thrace, Greece*
- *Ashu M. G. Solo (Congress Steering Committee & Publicity Chair; Assoc. Co-Editor); Fellow of British Computer Society, Principal/R&D Engineer, Maverick Technologies America Inc.*
- *Dr. William Spataro (Session Organizer/Chair & Co-Editor); University of Calabria, Italy*
- *Prof. Fernando G. Tinetti (Congress Steering Committee & Co-Editor); School of Computer Science, Universidad Nacional de La Plata, La Plata, Argentina; Co-editor, Journal of Computer Science and Technology (JCS&T)*
- *Prof. Quoc-Nam Tran (BIOCOMP & FCS); Professor and Chair, Department of Computer Science, University of South Dakota, USA*
- *Dr. Giuseppe A. Trunfio (Session Organizer/Chair & Co-Editor); University of Sassari, Italy*
- *Prof. Patrick S. P. Wang (Congress Steering Committee); Fellow: IAPR, ISIBM, WASE; Professor of Computer and Information Science, Northeastern University, Boston, Massachusetts, USA and Zijiang Visiting Chair, ECNU, Shanghai, NTUST, Taipei; iCORE Visiting Professor, University of Calgary, Canada; Otto-von-Guericke Distinguished Guest Professor, University Magdeburg, Germany*
- *Prof. Shih-Jeng Wang (Congress Steering Committee); Department of Information Management, Central Police University, Taiwan; Program Chair, Security & Forensics, Taiwan; R.O.C.; Director, Information Crypto and Construction Lab (ICCL) & ICCL-FROG*
- *Dr. Wei Wei (ICWN); School of Computer Science and Engineering, Xi'an University of Technology, Xi'an, P. R. China; Member of China Computer Federation (CCF), P. R. China*
- *Dr. Alexander Woehrer (ABDA); Program Manager ICT, Vienna Science and Technology Fund, Vienna, Austria*
- *Prof. Mary Q. Yang (Congress Steering Committee and Vice Chair of ABDA and BIOCOMP); Director, Mid-South Bioinformatics Center and Joint Bioinformatics Ph.D. Program, Medical Sciences and George W. Donaghey College of Engineering and Information Technology, University of Arkansas, USA*
- *Prof. Jane You (Vice-Chair, IPCV); Department of Computing, The Hong Kong Polytechnic University, Hong Kong*

We would like to extend our appreciation to the members of the program committees of individual sessions, tracks, and workshops; their names do not appear in this document; they are listed on the web sites of individual tracks.

As Sponsors-at-large, partners, and/or organizers each of the followings (separated by semicolons) provided help for at least one track of the World Congress: Computer Science Research, Education, and Applications Press (CSREA); Taylor & Francis, UK (<http://www.taylorandfrancis.com/>); US Chapter of World Academy of Science (<http://www.world-academy-of-science.org/>) ; American Council on Science & Education & Federated Research Council (<http://www.americancse.org/>); HoIP, Health Without Boundaries, Healthcare over Internet Protocol, UK (<http://www.hoip.eu>); HoIP Telecom, UK (<http://www.hoip-telecom.co.uk>); and WABT, Human Health Medicine, UNESCO NGOs, Paris, France (<http://www.thewabt.com/>). In addition, a number of university faculty members and their staff (names appear on the cover of the set of proceedings), several publishers of computer science and computer engineering books and journals, chapters and/or task forces of computer science associations/organizations from 5 countries, and developers of high-performance machines and systems provided significant help in organizing the conference as well as providing some resources. We are grateful to them all.

We express our gratitude to keynote, invited, and individual conference/tracks and tutorial speakers - the list of speakers appears on the conference web site. We would also like to thank the followings: UCMSS (Universal Conference Management Systems & Support, California, USA) for managing all aspects of the conference; Dr. Tim Field of APC for managing the printing of the proceedings; and the staff of Monte Carlo Resort (Convention department) in Las Vegas for the professional service they provided. Last but not least, we would like to thank the Co-Editors and Associate Co-Editors of PDPTA'14: Prof. Hamid R. Arabnia, Prof. Lou D'Alotto, Dr. George A. Gravvanis, Prof. Hiroshi Ishii, Prof. Minoru Ito, Prof. George Jandieri, Prof. Kazuki Joe, Prof. Hiroaki Nishikawa, Prof. Georgios Sirakoulis, Ashu M. G. Solo, Prof. William Spataro, Prof. Fernando G. Tinetti, and Prof. Giuseppe A. Trunfio.

We present the proceedings of PDPTA'14.

Steering Committee, 2014
<http://www.world-academy-of-science.org/>

Contents

SESSION: PARALLEL COMPUTING AND ALGORITHMS + MULTI-CORE AND ENERGY-AWARE COMPUTING

Modeling the Effects on Power and Performance from Memory Interference of Co-located Applications in Multicore Systems	3
<i>Daniel Dauwe, Ryan Friese, Sudeep Pasricha, Anthony Maciejewski, Gregory Koenig, Howard Siegel</i>	
Processing NOAA Observation Data over Hybrid Computer Systems for Comparative Climate Change Analysis	10
<i>Xuan Shi, Dali Wang</i>	
High Efficiency Video Decoding on Multicore Processor	16
<i>Hyeonggeon Lee, Jong Kang Park, Jong Tae Kim</i>	
Design of an In-Memory Database Engine Using Intel Xeon Phi Coprocessors	21
<i>Michael Scherger</i>	
Accelerating Medical Image Registration Using a SIMD Array	28
<i>Inkeyu Jeong, Myeongsu Kang, Cheolhong Kim, Jongmyon Kim</i>	
Processing Hard Sphere Collisions on a GPU Using OpenCL	35
<i>Zachary Langbert, Mark Lewis</i>	
Scalable Self-Tuning Implementation of Smith-Waterman Algorithm for Multicore CPUs	42
<i>Faisal Sikder, Dilip Sarkar</i>	
Low-power Task Scheduling in Homogeneous Quad-core Processor	49
<i>Kyuhan Kim, Myungha Kim, Hyeonggeon Lee, Jong Kang Park, Jong Tae Kim</i>	
An SIMD Architecture for Shortest-Path Search and Its FPGA Implementation	53
<i>Yasuhiro Takei, Masanori Hariyama, Michitaka Kameyama</i>	
Parallel Fuzzy Filter for Impulse Noise Removal	57
<i>Josep Arnal, Leroy Drummond, Luis Sucar, Vicente Vidal</i>	
Parallel Insertion Merge	63
<i>Fernando Couto, Fabio Couto</i>	
Maximizing Hardware Performance via Non-blocking Collective Communication for All Pairs Shortest Paths Computation on Heterogeneous Multi-core Processors	66
<i>Eduardo A. Colmenares, Yu Zhuang</i>	

How to Find the Best Rules for CA-based PRNG	71
<i>Mirosław Szaban</i>	
 SESSION: COMMUNICATION SYSTEMS AND INPUT OUTPUT SYSTEMS + INTERCONNECTION NETWORKS AND TOPOLOGIES + ROUTING METHODS + NEW PROTOCOLS + VANET + PEER-TO-PEER NETWORKS + SENSOR NETWORKS AND APPLICATIONS	
A Fault-tolerant Routing Algorithm based on Safety Levels in a Hyper-Star Graph	77
<i>Yuko Sasaki, Yuki Hirai, Hironori Nakajo, Keiichi Kaneko</i>	
A Novel Quorum Protocol for Improved Performance	84
<i>Parul Pandey, Maheshwari Tripathi</i>	
Incentive Scheme for P2P Live Streaming Systems Being Aware of the Upload Capability of the Participants	91
<i>Shogo Kanda, Satoshi Fujita</i>	
On Deriving Mean Chord Length for Structured Overlay Networks	98
<i>Pankaj Anthwal</i>	
Linux Software RAID Level 0 Technique for High Performance Computing by using PCI-Express based SSD	107
<i>Jae Gi Son, Taegyeong Kim, Kuk Jin Jang, Hyedong Jung</i>	
The Static and Dynamic Performance of an Adaptive Routing Algorithm of 2-D Torus Network Based on Turn Model	114
<i>Yasuyuki Miura, Kentaro Shimozono, Kazuya Matoyama, Shigeyoshi Watanabe</i>	
A Prediction-Based Approach for Collective I/O Optimization	121
<i>Chaoqun Sha, Hua Nie, Huaiming Song, Chenming Zheng, Xiaojun Yang, Chungjin Hu</i>	
GPU-based String Matching Method Using Warp Shuffle Instructions for Service-oriented Routers	128
<i>Satoshi Koibuchi, Kazumasa Ikeuchi, Shinichi Ishida, Hiroaki Nishi</i>	
Study of Dynamically-Allocated Multi-Queue Buffers for NoC Routers	135
<i>Yung-Chou Tsai, Yarsun Hsu</i>	
Simulation of a Centralized Reputation System for VANETs	142
<i>Mario Cleber Bidoia, Marcos Cavenaghi, Roberta Spolon, Renata Lobato, Aleardo Manacero Jr., Daniel Lobato</i>	

How to Tolerate Simultaneous Leave of Peers in Tree-Structured P2P Live Streaming Systems 149

Tatsuya Kouchi, Satoshi Fujita

Three Dimensional Free Space Optical Network Reconfiguration Heuristics Using Active Link Removal 156

Xuemei Sun, Danny Luong, Gilbert Young

SESSION: MATHEMATICAL MODELING AND PROBLEM SOLVING, MPS

Acceleration of Poisson Corrupted Image Restoration with Loopy Belief Propagation 165

Hayaru Shouno

Singularity Size Optimization in Data Deduplication Technique 171

Mie Ogiwara, Mizuki Takaya, Teruhisa Kasuya, Itaru Koike, Toshiyuki Kinoshita

Improvement of a Conformational Search on Protein-ligand Docking Based on Optimal Arrangement of Multiple Small Search Grids 176

Tomohiro Ban, Takashi Ishida, Yutaka Akiyama

Validation of EEG Personal Authentication with Multi-channels and Multi-tasks 182

Yu Ishikawa, Chinami Yoshida, Masami Takata, Kazuki Joe

Emotion Estimation of Comments on Web News by SVM and Naive Bayes Based Classifiers 189

Yasuhiro Tajima, Genichiro Kikui

Grobner Basis of Non-Negative Matrix Factorization and Feature Extraction of Cross-Site Scripting Attacks 195

Takeshi Matsuda

Accelerating the Numerical Computation of Positive Roots of Polynomials using Improved Bounds 201

Kinji Kimura, Takuto Akiyama, Hiroyuki Ishigami, Masami Takata, Yoshimasa Nakamura

Scalable 3D Modeling Using Multi-player Interactive Genetic Algorithm on Cloud Platform as a Service 208

Takahito Seyama, Shintaro Bando, Masaharu Munetomo

Selecting Strategies in Particle Swarm Optimization by Sampling-Based Landscape Modality Detection 215

Tetsuyuki Takahama, Setsuko Sakai

A Study on Non-Correspondence in Spread between Objective Space and Design Variable Space in Pareto Solutions 222

Tomohiro Yoshikawa, Toru Yoshida

Task Scheduling Algorithm for Multicore Processor Systems with Turbo Boost and Hyper-Threading 229

Yosuke Wakisaka, Naoki Shibata, Junji Kitamichi, Keiichi Yasumoto, Minoru Ito

Multiple Precision Integer Multiplication on GPUs 236

Koji Kitano, Noriyuki Fujimoto

Combining the Phoenix Flash Code with the Binary Index Flash Code for Low Write Deficiency 243

Geonina Noriel Corneby, Lea Karla Sanchez, Proceso Fernandez, Michael Joseph Tan, Yuichi Kaji

A CIL Virtual Machine for Wireless Sensor Network Applications 248

Yutaka Yanagisawa, Yasue Kishino, Takayuki Suyama, Tsutomu Terada, Masahiko Tsukamoto, Futoshi Naya

Quantifying Sentiment for the Japanese Economy and Stock Price Prediction 255

Hiroshi Ishijima, Takuro Kazumi, Akira Maeda

**SESSION: PARALLEL PROGRAMMING AND NOVEL FRAMEWORKS +
PARALLEL ARCHITECTURES AND SYSTEMS**

Hybrid CPU-GPU Pipeline Framework 263

Fahad Khalid, Frank Feinbube, Andreas Polze

Implementing MPI Barrier with the NetFPGA 270

Omer Arap, Geoffrey Brown, Bryce Himebaugh, Martin Swamy

Method of Extracting Parallelization in Very Large Applications through Automated Tool and Iterative Manual Intervention 277

Smitha K. P, Aditi Sahasrabudhe, Vinay Vaidya

Wait-less Parallel (MPI) Programming: A Disciplined Approach 284

Ralph Butler, Chrisila Pettey, Nathan Reale

Study of Single-electron DOMINO Logic Circuit 287

Hiroyuki Otake, Takahide Oya, Tetsuya Asai

Impact of Thread Synchronization and Data Parallelism on Multicore Game Programming 293

Abu Asaduzzaman, Hin Yun Lee, Deepthi Gummadi

Multi-Gbps Fano Decoding Algorithm on GPGPU 299

Ozgur Ates, Selcuk Keskin, Taskin Kocak

Radiation Therapy Optimization with GPU Programming 305

David Allen, Ovidiu Daescu

Enhanced Automated Data Dependency Analysis for Functionally Correct Parallel Code 312

Prasad Pawar, Pramit Mehta, Naveen Boggarapu, Leo Grange

A Brief Survey on Parallel Programming Applications for Image Processing 319

Leticia Flores-Pulido, Esther Ortega-Mejia, Eduardo Vega-Alvarado, Juan Manuel-Alvarez

**SESSION: SYSTEMS SOFTWARE + PARALLEL PROGRAMMING MODELS +
PETRI NETS + CACHE COHERENCE**

Automatic Performance Tuning of Pipeline Patterns for Heterogeneous Parallel Architectures 327

Enes Bajrovic, Siegfried Benkner

Exploiting Reuse-Frequency with Speculative and Dynamic Updates in an Enhanced Directory Based Coherence Protocol 334

Nilufar Ferdous, Monobrata Debnath, Byeong Kil Lee, Eugene John

Miss-rate Based Dynamic Phase Tracking on Multicore Processors 341

Sourav Dutta, Nazeih Botros

Petri Net Based Algorithm Modelization and Parallel Execution on Symmetric Multiprocessors 347

Gustavo Wolfmann, Armando De Giusti

**SESSION: HIGH-PERFORMANCE COMPUTING + DISTRIBUTED
ALGORITHMS AND APPLICATIONS**

Real-time Token-based Mutual Exclusion Algorithms 357

Mitchell Nielsen

Cost-aware Short-term Load Forecasting of Power System 364

Kai-Chao Yang, Chung-Chieh Huang, Jia-Shung Wang

Design of an FPGA-Based FDTD Accelerator Using OpenCL 371

Yasuhiro Takei, Hasitha Muthumala Waidyasooriya, Masanori Hariyama, Michitaka Kameyama

A Practical Election Protocol Based on an Unreliable Failure Detector in Distributed Systems 376

Yong Hwan Cho, Sung-Hoon Park, Seon-Hyong Lee

Autonomic Management for Availability and Performance in SaaS Model 383
Nadir Kamal Salih Idries, Tianyi Zang

**SESSION: BIG DATA AND DATA ANALYTICS + RELATED TECHNOLOGIES
AND METHODS**

Hadoop MapReduce Configuration Parameters and System Performance: a Systematic Review 393
Ailton S Bonifacio, Andre Menolli, Fabiano Silva

PDTSSSE: A Scalable Parallel Decision Tree Algorithm Based on MapReduce 400
Yan Cui, Yuanyang Yang, Shizhong Liao

An Adaptive Data Resourcing Model to Relieve the Pain of Searching from Hybrid Clouds for Big Data 407
Yilang Wu, Junbo Wang, Zixue Cheng

Task Allocation and Node Activation for Energy-Proportional MapReduce Clusters 414
Min-Ki Kim, Haengrae Cho

SESSION: SCIENTIFIC COMPUTING, FFT, MATRIX PROBLEMS, LINEAR SYSTEMS, FINITE ELEMENT METHODS

Parallel Processing of Irregular Workloads on the GPGPU: Adaptive Quadrature 423
Derek Kern, Gita Alaghband

Embarrassingly Parallel Butterflies Solve Diagonally Dominant Tridiagonal Toeplitz Systems 430
Brian Murphy

Resiliency in IO Tools for Scientific Computing 437
William Dai

Parallelizing Matrix Exponential Based Solver on Shared Memory Systems Using Cilk 444
Abdul Jabbar Saeed Tipu, Ammar Hasan, Mohsan Jameel, Aamir Shafi

Analyzing the Effect of Contextual Information in Noise Based Classifier on Satellite Images 451
Rakesh Dwivedi, Sanjay Ghosh, Anil Kumar

SESSION: CLOUD AND GRID COMPUTING

Virtual Mmachine Instance Scheduling in IaaS Clouds 459
Naylor Bachiega, Henrique Martins, Roberta Spolon, Marcos Cavenaghi, Renata Lobato, Aleardo Manacero Jr.

Performance Analysis of Initialization Methods for Optimizing Artificial Bee Colony Grid Scheduling 464

Vigneswari T, Maluk Mohamed M A M

Framework to Detect and Repair Distributed Intrusions Based on Mobile Agent in Hybrid Cloud 471

Abir Khaldi, Kamel Karoui, Henda Ben Ghezala

Distributed Fast Fourier Transform (DFFT) on MapReduce Model for Arabic Handwriting Feature Extraction Technique via Cloud Computing Technologies 477

Hamdi Hassen, Maher Khemakhem

SESSION: ENERGY EFFICIENT NETWORKING SYSTEMS APPLICABLE TO EMERGENCY

An Optimization Study on Broadcast Based Information Sharing System (BBISS) 485

Sayuri Wada, Hiroshi Ishii, Hiroaki Nishikawa, Keisuke Utsu

A Safety Information Sharing Application on BBISS 490

Tomomi Itoh, Ayami Manaka, Yuuka Sugawara, Hiroshi Ishii, Hiroaki Nishikawa, Keisuke Utsu

Location Data Supplementing Information Transfer Method over MANET 496

Kei Kobayashi, Yosuke Totani, Hiroshi Sano, Keisuke Utsu, Hiroshi Ishii

A Proposal on Location-aided Route Discovery Based on Two-hop Neighbor Information Over Ad Hoc Network and its Preliminary Evaluation 502

Phonepadith Phoummavong, Keisuke Utsu, Hiroshi Ishii

A Proposal on Efficient Broadcast Based Information Transfer Method Using Location Data over MANET 509

Yosuke Totani, Keisuke Utsu, Hiroshi Ishii

Energy Efficient Data-Driven Networking Processor with Autonomous Load Distribution Capability 514

Shuji Sannomiya, Hiroaki Nishikawa

Spatial Parallelization of Self-Timed FFT Circuit 521

Norifumi Uno, Ryuichi Taguchi, Makoto Iwata

DL Timing-Error Detection and Recovery Circuit for Self-Timed Pipeline 528

Shohei Okamune, Kei Miyagi, Makoto Iwata

A Novel Information Sharing Architecture Constructed by Broadcast Based Information Sharing System (BBISS) 534

Keisuke Utsu, Chee Onn Chow, Hiroaki Nishikawa, Hiroshi Ishii

**SESSION: SIXTH COMPLEX SYSTEMS, THEORY AND APPLICATIONS
WORKSHOP, CSTAW 2014**

Traffic Regime and 1/f Noise for a Specific Approach to a City	543
<i>Reuben Thieberger</i>	
Synthetic Earthquakes Obtained With Two Cellular Automata Models And Comparison With Real Seismicity	549
<i>Alejandro Munoz-Diosdado</i>	
Parallelization of an Iterative Method for Solving Large and Sparse Linear Systems Using the CUDA-Matlab Integration	556
<i>Lauro Cassio Martins de Paula, Anderson da Silva Soares</i>	
Cellular Automata as Acceleration Kernel of Interconnection Network Simulation	561
<i>Takashi Yokota, Kanemitsu Ootsu, Takeshi Ohkawa</i>	
A Memory-Efficient Algorithm for Large-Scale Symmetric Tridiagonal Eigenvalue Problem on Multi-GPU Systems	568
<i>Hyunsu Cho, Peter Yoon</i>	
Computation of Control Related States of Top Left K-net System (with a Nonsharing Resource Place) of Petri Nets	574
<i>Daniel Yuh Chao, Tsung Hsien Yu, Ding Chun Huang</i>	
Efficient Anonymization of the SocioNet with the Aid of Rumor Riding	580
<i>Hiroki Iizuka, Satoshi Fujita</i>	
Parallelization of an Analytical Method for the Evaluation of Voltage Sags in Electric Power Systems	586
<i>Armando Antunez, Antonio Ramos, Elisa Espinosa, Carlos Ceja</i>	
The Solution of a FEM Equation in Frequency Domain Using a Parallel Computing with Cublas	592
<i>Raul Dominguez, Aurelio Medina, Antonio Ramos-Paz</i>	

SESSION: POSTERS

A Novel Method to Minimize Side Effects by Cache Contention on the Inclusive Multi-Core Shared Cache	601
<i>Hyo-Joong Suh</i>	

Study of Thermal-noise-assisted Signal Propagation of Neuromorphic Single-electron Circuit 603
Ryo Hirashima, Tetsuya Asai, Takahide Oya

SESSION: LATE BREAKING PAPERS AND POSITION PAPERS: PARALLEL AND DISTRIBUTED PROCESSING TECHNIQUES AND APPLICATIONS

Efficient Classification of Hyperspectral Images on Commodity GPUs using ELM-based Techniques 607

Javier Lopez-Fandino, Dora B. Heras, Francisco Arguello

A Second Generation of DEFG: Declarative Framework for GPUs 614

Robert Senser, Tom Altman

System Level Comparative Performance Analysis of H.264 Encoder by Network-on-Chip Topologies 620

Suk Ki Lee, Jong Kang Park, Jong Tae Kim

On the Optimization of HDA* for Multicore Machines. Performance Analysis 625

Victoria Sanz, Armando De Giusti, Marcelo Naiouf

Compiler-Level Explicit Cache for a GPGPU Programming Framework 632

Tomoharu Kamiya, Takanori Maruyama, Kazuhiko Ohno, Masaki Matsumoto

High Performance Embedded Software Design for Protective Relay Algorithm in Digital Signal Processors 639

Heung Sun Yoon, Myungha Kim, Jong Kang Park, Jong Tae Kim

Heuristics for Conversion Process of GPU's Kernels for Multiples Kernels with Concurrent Optimization Divergence 644

Jose Ritomar Carneiro Torquato, Esteban Walter Gonzalez Clua

Fault-Tolerant Dataases: Assessing the Risks and Costs 651

Berkay Surmeli, Martin Maskarinec, Kathleen Neumann

Viability of the Parallel Prefix Algorithm for Sequence Alignment on Massively Parallel GPUs 655

Christian Dicker, Samuel Kelly, John Sibandze, Jens Mache

Resocialization and Uses of Social Networks for Elderly 659

Cecile Treton, Christian Bourret

