

2015 IEEE 18th International Conference on Computational Science and Engineering (CSE 2015)

**Porto, Portugal
21 – 23 October 2015**



**IEEE Catalog Number: CFP15CSN-POD
ISBN: 978-1-4673-8298-4**

**Copyright © 2015 by the Institute of Electrical and Electronic Engineers, Inc
All Rights Reserved**

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

******This publication is a representation of what appears in the IEEE Digital Libraries. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number: CFP15CSN-POD
ISBN (Print-On-Demand): 978-1-4673-8298-4

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

CURRAN ASSOCIATES INC.
proceedings
.com

2015 IEEE 18th International Conference on Computational Science and Engineering

CSE 2015

Table of Contents

Message from the CSE 2015 General Chairs.....	x
Message from the CSE 2015 Program Chairs.....	xi
Message from the CSE 2015 Steering Committee.....	xii
CSE 2015 Organizing Committee.....	xiii
CSE 2015 Program Committee.....	xvi
CSE 2015 Additional Reviewers.....	xxii
CSE 2015 Sponsors and Exhibitors.....	xxiii

Regular Papers

Scientific and Engineering Computing

Multi-domain Grid Refinement for Lattice-Boltzmann Simulations on Heterogeneous Platforms.....	1
<i>Pedro Valero-Lara and Johan Jansson</i>	
Automatic Source-to-Source Error Compensation of Floating-Point Programs.....	9
<i>Laurent Thévenoux, Philippe Langlois, and Matthieu Martel</i>	
CPU+GPU Programming of Stencil Computations for Resource-Efficient Use of GPU Clusters.....	17
<i>Mohammed Sourouri, Johannes Langguth, Filippo Spiga, Scott B. Baden, and Xing Cai</i>	
Gpf4Med: A Large-Scale Graph Processing System Applied to the Study of Breast Cancer.....	27
<i>Lorena Calabuig Monerris, Erik Torres Serrano, J. Damia Segrelles Quilis, and Ignacio Blanquer Espert</i>	

Advanced Networking and Applications

QoE Enhancement of Audiovisual and Haptic Interactive IP Communications by User-Assistance.....	35
<i>Suguru Kaede, Toshiro Nunome, and Shuji Tasaka</i>	
Offline Lightpath Allocation in All-Optical Networks with Impairment Aware RWA Based on the GN Model.....	43
<i>Dorabella Santos and Amaro de Sousa</i>	

Performance Evaluation of TCP over Optical Burst-Switched Data Center Network	51
<i>Muhammad Imran, Martin Collier, Pascal Landais, and Kostas Katrinis</i>	
Applying Event-B Refinement to the Sliding Window Protocol	58
<i>Sanae El Mimouni and Mohamed Bouhdadi</i>	
Spread Spectrum Audio Indoor Localization	66
<i>João Moutinho, Diamantino Freitas, and Rui Esteves Araújo</i>	
A Domain Independent Pedestrian Dead Reckoning System for Tracking and Localization	72
<i>Sara Paiva</i>	
Delays and Resource Analysis for Next-Generation Digital Broadcasting Systems	78
<i>Hyung-Yoon Seo, Inyong Kang, Byungjun Bae, Hyungsoo Lim, and Jong-Deok Kim</i>	
Big Data Analytics	
Clustering of Complex Data-Sets Using Fractal Similarity Measures and Uncertainties	82
<i>Maximilian Hoecker, Kai Lars Polsterer, Sven Dennis Kügler, and Vincent Heuveline</i>	
Temporal Interval Reasoning with Korean Historical Event	92
<i>Phearom Meas, Kyeong-Jin Oh, Myung-Duk Hong, Geun-Sik Jo, and Young-Tack Park</i>	
A Parallel Computing Hybrid Approach for Feature Selection	97
<i>Jorge Silva, Ana Aguiar, and Fernando Silva</i>	
Automatic Human Action Recognition from Video Using Hidden Markov Model	105
<i>Palwasha Afsar, Paulo Cortez, and Henrique Santos</i>	
Embedded, Ubiquitous, and Cloud Computing	
Towards Out-of-the-Box Programming of Wireless Sensor-Actuator Networks	110
<i>Gil Ferro, Roberto Silva, and Luís Lopes</i>	
Off-Chip/On-chip Gateway Architecture for Mixed-Criticality Systems Based on Networked Multi-core Chips	120
<i>Mohammed Abuteir, Romn Obermaisser, Zaher Owda, and Thierry Moudouthe</i>	
Towards Cloud Storage Services Characterization	129
<i>Daniela Oliveira, Paulo Carvalho, and Solange Rito Lima</i>	
Multi-workflow QoS-Constrained Scheduling for Utility Computing	137
<i>Hamid Arabnejad and Jorge G. Barbosa</i>	
Security, Privacy, and Trust	
My Smart Home is Under Attack	145
<i>Luigi Coppolino, Valerio D'Alessandro, Salvatore D'Antonio, Leonid Levy, and Luigi Romano</i>	
Network Attack Detection Based on Combination of Neural, Immune and Neuro-Fuzzy Classifiers	152
<i>Alexander Branitskiy and Igor Kottenko</i>	
ID-CONNECT: Combining Network and Call Features to Link Different Identities of a User	160
<i>Muhammad Ajmal Azad and Ricardo Morla</i>	

The Genetic Approach for Design of Virtual Private Networks	168
<i>Igor Kotenko and Igor Saenko</i>	

Education

Enhance Lecture Archive Search with OCR Slide Detection and In-Memory Database Technology	176
<i>Martin Malchow, Matthias Bauer, and Christoph Meinel</i>	
Student Perceptions of Cloud Computing Effectiveness in Higher Education	184
<i>Sadaf Ashtari and Ali Eydgahi</i>	
Game Design Techniques for Software Engineering Management Education	192
<i>Pedro Letra, Ana Cristina Ramada Paiva, and Nuno Flores</i>	

Distributed and Parallel Computing I

An Efficient Task-Based Execution Model for Stochastic Linear Solver on Multi-core and Many-Core Systems	200
<i>Fan Ye, Christophe Calvin, and Serge Petiton</i>	
Analyzing Large-Scale DNA Sequences on Multi-core Architectures	208
<i>Suejb Memeti and Sabri Pllana</i>	
A Simulation Framework for Efficient Resource Management on Hybrid Systems	216
<i>Sergio Tasso, Osvaldo Gervasi, Flavio Vella, and Alfredo Cuzzocrea</i>	
Graph-Based Caching for Server-Push Enabled Adaptive Hypertext Applications	224
<i>Daniel Thommes, Ansgar Gerlicher, Qi Wang, and Christos Grecos</i>	

Scheduling, Routing, and Requirements Engineering

A Weighted Constraint Optimization Approach to the Nurse Scheduling Problem	233
<i>Diogo Santos, Pedro Fernandes, Henrique Lopes Cardoso, and Eugénio Oliveira</i>	
Discrete Cuckoo Search for Resource Constrained Project Scheduling Problem	240
<i>Kirils Bibiks, Fun Hu, Jian-Ping Li, and Aleister Smith</i>	
Modified Self Organizing Neural Network Algorithm for Solving the Vehicle Routing Problem	246
<i>Meghan Steinhilber, Arash Nasrolahi Shirazi, and Manbir Sodhi</i>	
Effective Requirements Engineering for CSE Projects: A Lightweight Tool	253
<i>Yang Li, Emitza Guzman, and Bernd Bruegge</i>	

Distributed and Parallel Computing II

Adaptive Runtime Filtering: Reducing Trace Size and Bias in Event-Based Performance Analysis	262
<i>Jonas Stolle, Michael Wagner, Jens Doleschal, Felix Schmitt, and Holger Brunst</i>	
Towards Robust Resource Allocations via Performance Modeling with Stochastic Process Algebra	270
<i>Srishti Srivastava and Ioana Banicescu</i>	

Consistency of Replicated Log for Service Recovery	278
<i>Anna Kobusińska and Dariusz Wawrzyniak</i>	

An Improved Algorithm for Simulating the Mechanical Behavior of Super Carbon Nanotubes	286
<i>Michael Burger, Christian Bischof, Christian Schröppel, and Jens Wackerfuß</i>	

Intelligent and Bio-inspired Computing

Combining Keystroke Dynamics and Face Recognition for User Verification	294
<i>Abhinav Gupta, Agrim Khanna, Anmol Jagetia, Devansh Sharma, Sanchit Alekh, and Vaibhav Choudhary</i>	

Demand-Side Management in Power Grids: An Ant Colony Optimization Approach	300
<i>André Silva, João Marinheiro, Henrique Lopes Cardoso, and Eugénio Oliveira</i>	

Citation Impact Categorization: For Scientific Literature	307
<i>Myriam Hernández-Alvarez and José M. Gómez</i>	

Short Papers

Cloud, Security, and Privacy

An Intuitive Information Share System for Mobile Devices	314
<i>Sara Paiva</i>	

A Resilient Methodology for Accessing and Exploiting Data and Scientific Codes on Distributed Environments	319
<i>M. Rodriguez-Pascual, G. LaRocca, C. Kanellopoulo, C. Carrubba, G. Inserra, R. Ricceri, H. Asorey, A. J. Rubio-Montero, E. Núñez-González, L. A. Núñez, O. Prnjat, R. Barbera, and R. Mayo-García</i>	

The Min-Max in LC and Max-Log MAP in LC for MTR Decoding in Two-Track Magnetic Recording Systems	324
<i>Nikola Djuric and Vojin Senk</i>	

Big Data Analytics

Development of Scientific Research in Mozambique: Technological Challenges and Trends	329
<i>Marangaze Munhepe Mulhanga, Solange Rito Lima, and Venâncio Massingue</i>	

An Unsupervised Approach for Identifying the Infobox Template of Wikipedia Article	334
<i>Hanif Bhuiyan, Kyeong-Jin Oh, Myung-Duk Hong, and Geun-Sik Jo</i>	

Special Session on FET-HPC and Exascale Recently EU-Funded Projects

EXTRA: Towards an Efficient Open Platform for Reconfigurable High Performance Computing	339
<i>Cătălin Bogdan Ciobanu, Ana Lucia Varbanescu, Dionisios Pnevmatikatos, George Charitopoulos, Xinyu Niu, Wayne Luk, Marco D. Santambrogio, Donatella Sciuto, Muhammed Al Kadi, Michael Huebner, Tobias Becker, Georgi Gaydadjiev, Andreas Brokalakis, Antonis Nikitakis, Alex J. W. Thom, Elias Vansteenkiste, and Dirk Stroobandt</i>	

ANTAREX — AutoTuning and Adaptivity appRoach for Energy Efficient eXascale HPC Systems	343
<i>Cristina Silvano, Giovanni Agosta, Andrea Bartolini, Andrea Beccari, Luca Benini, João M. P. Cardoso, Carlo Cavazzoni, Jan Martinovič, Gianluca Palermo, Martin Palkovič, Erven Rohou, Nico Sanna, and Katerina Slaninova</i>	
Run-Time Exploitation of Application Dynamism for Energy-Efficient Exascale Computing (READEX)	347
<i>Yury Oleynik, Michael Gerndt, Joseph Schuchart, Per Gunnar Kjeldsberg, and Wolfgang E. Nagel</i>	
The MANGO FET-HPC Project: An Overview	351
<i>José Flich, Giovanni Agosta, Philipp Ampletzer, David Atienza Alonso, Alessandro Cilardo, William Fornaciari, Mario Kovač, Fabrice Roudet, and Davide Zoni</i>	
Author Index	355