## Contents

**EUROEDUPAR - European Workshop on Parallel and Distributed Computing Education for Undergraduate Students**

<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lattice Boltzmann Flow Simulation on Android Devices for Interactive Mobile-Based Learning</td>
<td>3</td>
</tr>
<tr>
<td><em>Philipp Neumann and Michael Zellner</em></td>
<td></td>
</tr>
<tr>
<td>Using Everest Platform for Teaching Parallel and Distributed Computing.</td>
<td>16</td>
</tr>
<tr>
<td><em>Oleg Sukhoroslov</em></td>
<td></td>
</tr>
<tr>
<td>Experiences with Teaching a Second Year Distributed Computing Course</td>
<td>28</td>
</tr>
<tr>
<td><em>Rizos Sakellariou</em></td>
<td></td>
</tr>
</tbody>
</table>

**HETEROPAR - Workshop on Algorithms, Models and Tools for Parallel Computing on Heterogeneous Platforms**

<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distributed In-GPU Data Cache for Document-Oriented Data Store via PCIe over 10 Gbit Ethernet</td>
<td>41</td>
</tr>
<tr>
<td><em>Shin Morishima and Hiroki Matsutani</em></td>
<td></td>
</tr>
<tr>
<td>Resource Aggregation for Task-Based Cholesky Factorization on Top of Heterogeneous Machines</td>
<td>56</td>
</tr>
<tr>
<td><em>T. Cojean, A. Guermouche, A. Hugo, R. Namyst, and P.A. Wacrenier</em></td>
<td></td>
</tr>
<tr>
<td>Task-Based Conjugate Gradient: From Multi-GPU Towards Heterogeneous Architectures</td>
<td>69</td>
</tr>
<tr>
<td><em>E. Agullo, L. Giraud, A. Guermouche, S. Nakov, and J. Roman</em></td>
<td></td>
</tr>
<tr>
<td>Task-Based Sparse Hybrid Linear Solver for Distributed Memory Heterogeneous Architectures</td>
<td>83</td>
</tr>
<tr>
<td><em>Emmanuel Agullo, Luc Giraud, and Stojce Nakov</em></td>
<td></td>
</tr>
<tr>
<td>Automatic Generation of OpenCL Code for ARM Architectures</td>
<td>96</td>
</tr>
<tr>
<td><em>Sergio Afonso, Alejandro Acosta, and Francisco Almeida</em></td>
<td></td>
</tr>
<tr>
<td>Workflow Performance Profiles: Development and Analysis</td>
<td>108</td>
</tr>
<tr>
<td><em>Dariusz Król, Rafael Ferreira da Silva, Ewa Deelman, and Vickie E. Lynch</em></td>
<td></td>
</tr>
</tbody>
</table>
A Data-Parallel ILUPACK for Sparse General and Symmetric Indefinite Linear Systems ................................................................. 121
José I. Aliaga, Matthias Bollhöfer, Ernesto Dufrechou, Pablo Ezzatti, and Enrique S. Quintana-Ortí

Performance and Power-Aware Classification for Frequency Scaling of GPGPU Applications .................................................. 134
João Guerreiro, Aleksandar Ilic, Nuno Roma, and Pedro Tomás

IWMSE - International Workshop on Multicore Software Engineering

A Context-Aware Primitive for Nested Recursive Parallelism ............. 149
Herbert Jordan, Peter Thoman, Peter Zangerl, Thomas Heller, and Thomas Fahringer

Achieving High Parallel Efficiency on Modern Processors for X-Ray Scattering Data Analysis ...................................................... 162
Abhinav Sarje, Xiaoye S. Li, and Nicholas Wright

Exploiting a Parametrized Task Graph Model for the Parallelization of a Sparse Direct Multifrontal Solver .................................. 175
Emmanuel Agullo, George Bosilca, Alfredo Buttari, Abdou Guermouche, and Florent Lopez

Parallel String Matching ............................................................... 187
Philip Pfaffe, Martin Tillmann, Sarah Lutteropp, Bernhard Scheirle, and Kevin Zerr

Speed-Up Computational Finance Simulations with OpenCL on Intel Xeon Phi ................................................................. 199
Michail Papadimitriou, Joris Cramwinckel, and Ana Lucia Varbanescu

LSDVE - Workshop on Large-Scale Distributed Virtual Environments

TallyNetworks: Protecting Your Private Opinions with Edge-Centric Computing .......................................................... 211
Marc Ruiz Rodríguez, Pedro García López, and Marc Sánchez-Artigas

Balancing Speedup and Accuracy in Smart City Parallel Applications .... 224
Carlo Mastroianni, Eugenio Cesario, and Andrea Giordano

Multi-objective Optimization Framework for VMI Distribution in Federated Cloud Repositories ............................................. 236
Dragi Kimovski, Nishant Saurabh, Sandi Gec, Vlado Stankovski, and Radu Prodan
Adgt.js: A Web Application Framework for Peer-to-Peer Location-Based Services ............................................ 248  
Giacomo Brambilla, Michele Amoretti, and Francesco Zanichelli

VM Image Repository and Distribution Models for Federated Clouds: State of the Art, Possible Directions and Open Issues .............................................. 260  
Nishant Saurabh, Dragi Kimovski, Simon Ostermann, and Radu Prodan

TRACE: Generating Traces from Mobility Models for Distributed Virtual Environments ........................................... 272  
Emanuele Carlini, Alessandro Lulli, and Laura Ricci

Towards a Methodology to Form Microservices from Monolithic Ones ...... 284  
Gabor Kecskemeti, Attila Kertesz, and Attila Csaba Marosi

Misrouted Prophecy – On the Impact of Security Attacks on PRoPHET ...... 296  
Raphael Bialon and Kalman Graffi

PADABS -Workshop on Parallel and Distributed Agent-Based Simulations A Standardised Benchmark for Assessing the Performance of Fixed Radius Half Neighbours ................................................................. 311  
Robert Chisholm, Paul Richmond, and Steve Maddock

D-MASON on the Cloud: An Experience with Amazon Web Services ...... 322  
Michele Carillo, Gennaro Cordasco, Flavio Serrapica, Carmine Spagnuolo, Przemysaw Szufel, and Luca Vicidomini

Load-Sharing Policies in Parallel Simulation of Agent-Based Demographic Models ..................................................... 334  
Alessandro Pellegrini, Cristina Montañola-Sales, Francesco Quaglia, and Josep Casanovas-García

Computational Considerations for a Global Human Well-Being Simulation ................................................................. 347  
Aaron Howell and Paul Brenner

PBIO - International Workshop on Parallelism in Bioinformatics High Performance Small RNA Detection with Pipelined Task Parallel Computation Model ................................................................. 359  
Linqiang Ouyang and Jin H. Park

Improving Memory Accesses for Heterogeneous Parallel Multi-objective Feature Selection on EEG Classification ................................................................. 372  
Juan José Escobar, Julio Ortega, Jesús González, and Miguel Damas
Improving Multiobjective Phylogenetic Searches by Using a Parallel ε-Dominance Based Adaptation of the Firefly Algorithm

Sergio Santander-Jiménez and Miguel A. Vega-Rodríguez

Evaluation of Parallel Differential Evolution Implementations on MapReduce and Spark

Diego Teijeiro, Xoán C. Pardo, David R. Penas, Patricia González, Julio R. Banga, and Ramón Doallo

Performance Analysis and Optimization of SAMtools Sorting

Nathan T. Weeks and Glenn R. Luecke

Ultra-Fast Detection of Higher-Order Epistatic Interactions on GPUs

Daniel Jünger, Christian Hundt, Jorge González-Domínguez, and Bertil Schmidt

A Framework for Accessible Cluster-Enabled Epistatic Analysis

Alex Upton, Johan Karlsson, Oswaldo Trelles, Miguel Hernandez, and Juan Elvira

Two-Level Parallelism to Accelerate Multiple Genome Comparisons

Oscar Torreno and Oswaldo Trelles

Improving Bioinformatics Analysis of Large Sequence Datasets Parallelizing Tools for Population Genomics

Javier Navarro, Gonzalo Vera, Sebastián Ramos-Onsins, and Porfidio Hernández

A Data Partitioning Model for Highly Heterogeneous Systems

S. Tabik, G. Ortega, E.M. Garzón, and D. Suárez

Seamless HPC Integration of Data-Intensive KNIME Workflows via UNICORE

Richard Grunzke, Florian Jug, Bernd Schuller, René Jäkel, Gene Myers, and Wolfgang E. Nagel

Optimized Execution Strategies for Sequence Aligners on NUMA Architectures

Josefina Lenis and Miquel Angel Senar

Architecture for the Execution of Tasks in Apache Spark in Heterogeneous Environments

Estefania Serrano, Javier García Blas, Jesus Carretero, and Monica Abella
PELGA - Performance Engineering for Large-Scale Graph Analytics

Parametric Multi-step Scheme for GPU-Accelerated Graph Decomposition into Strongly Connected Components ........................................ 519
Stefano Aldegheri, Jiří Barnat, Nicola Bombieri, Federico Busato, and Milan Češka

Investigations on Path Indexing for Graph Databases ......................... 532
Jonathan M. Sumrall, George H.L. Fletcher, Alexandra Poulovassilis, Johan Svensson, Magnus Vejlstrup, Chris Vest, and Jim Webber

Improving Performance of Distributed Graph Traversals via Application-Aware Plug-In Work Scheduler ................................. 545
Jesun Sahariar Firoz, Marcin Zalewski, Martina Barnas, and Andrew Lumsdaine

Synthetic Graph Generation for Systematic Exploration of Graph Structural Properties .................................................. 557
Merijn Verstraaten, Ana Lucia Varbanescu, and Cees de Laat

Towards the Next Generation of Large-Scale Network Archives ............... 571
Stijn Heldens, Ana Varbanescu, Wing Lung Ngai, Tim Hegeman, and Alexandru Iosup

REPPAR - International Workshop on Reproducibility in Parallel Computing

Luis Felipe Millani and Lucas Mello Schnorr

The Information Needed for Reproducing Shared Memory Experiments ...... 596
Vincent Gramoli

Reproducible, Accurately Rounded and Efficient BLAS ........................ 609
Chemseddine Chohra, Philippe Langlois, and David Parello

RESILIENCE - Workshop on Resiliency in High Performance Computing in Clusters, Clouds, and Grids

Horseshoes and Hand Grenades: The Case for Approximate Coordination in Local Checkpointing Protocols ......................... 623
Patrick M. Widener, Kurt B. Ferreira, and Scott Levy

A Massively-Parallel, Fault-Tolerant Solver for High-Dimensional PDEs .. 635
Mario Heene, Alfredo Parra Hinojosa, Hans-Joachim Bungartz, and Dirk Pflüger
On the Inherent Resilience of Integer Operations

Laura Monroe, William M. Jones, Scott R. Lavigne, Claude H. Davis IV, Qiang Guan, and Nathan DeBardeleben

Pragma-Controlled Source-to-Source Code Transformations for Robust Application Execution

Pedro C. Diniz, Chunhua Liao, Daniel J. Quinlan, and Robert F. Lucas

A Cooperative Approach to Virtual Machine Based Fault Injection

Thomas Naughton, Christian Engelmann, Geoffroy Vallée, Ferrol Aderholdt, and Stephen L. Scott

ROME - Workshop on Runtime and Operating Systems for the Many-Core Era

Dealing with Layers of Obfuscation in Pseudo-Uniform Memory Architectures

Randolf Rotta, Robert Kuban, Mark Simon Schöps, and Jörg Nolte

Exploring Task Parallelism for Heterogeneous Systems Using Multicore Task Management API

Suyang Zhu, Sunita Chandrasekaran, Peng Sun, Barbara Chapman, Marcus Winter, and Tobias Schuele

Reducing Response Time with Preheated Caches

Mathias Gottschlag and Frank Bellosa

Viability of Virtual Machines in HPC: A State of the Art Analysis

Jens Breitbart, Simon Pickartz, Josef Weidendorfer, and Antonello Monti

UCHPC - UnConventional High-Performance Computing

The ICARUS White Paper: A Scalable, Energy-Efficient, Solar-Powered HPC Center Based on Low Power GPUs

Markus Geveler, Dirk Ribbrock, Daniel Donner, Hannes Ruelmann, Christoph Höppke, David Schneider, Daniel Tomachewski, and Stefan Turek

Exploiting In-Memory Processing Capabilities for Density Functional Theory Applications

Paul F. Baumeister, Thorsten Hater, Dirk Pleiter, Hans Boettiger, Thilo Maurer, and José R. Brunheroto

Are Low-Power SoCs Feasible for Heterogenous HPC Workloads?

Max Plauth and Andreas Polze
In-Cache Streaming: Morphable Infrastructure for Many-Core Processing Systems ................................. 775
   Nuno Neves, Adrien Mussio, Fabien Gonçalves, Pedro Tomás, and Nuno Roma

A Low-Cost Energy-Efficient Raspberry Pi Cluster for Data Mining Algorithms ........................................ 788
   João Saffran, Gabriel Garcia, Matheus A. Souza, Pedro H. Penna, Márcio Castro, Luís F.W. Góes, and Henrique C. Freitas

Theano-MPI: A Theano-Based Distributed Training Framework ......................................................... 800
   He Ma, Fei Mao, and Graham W. Taylor

Acceleration of Turbomachinery Steady Simulations on GPU .......................................................... 814
   Mohamed Hassanine Aissa, Lasse Müller, Tom Verstraete, and Cornelis Vuik

Author Index ......................................................... 827
Euro-Par 2016: Parallel Processing Workshops
Euro-Par 2016 International Workshops, Grenoble, France, August 24-26, 2016, Revised Selected Papers
2017, XXXIX, 829 p. 281 illus., Softcover
ISBN: 978-3-319-58942-8