

# Table of Contents – Part I

## First Workshop on Applications of Parallel Computation in Industry and Engineering (APCI&E 2014)

On Parallelization of the OpenFOAM-Based Solver for the Heat Transfer in Electrical Power Cables .....	1
<i>Raimondas Čiegis, Vadimas Starikovičius, and Andrey Bugajev</i>	
CPU and GPU Performance of Large Scale Numerical Simulations in Geophysics .....	12
<i>Ali Dorostkar, Dimitar Lukarski, Björn Lund, Maya Neytcheva, Yvan Notay, and Peter Schmidt</i>	
Parallelizing a CAD Model Processing Tool from the Automotive Industry .....	24
<i>Luis Ayuso, Herbert Jordan, Thomas Fahringer, Bernhard Kornberger, Martin Schifko, Bernhard Höckner, Stefan Moosbrugger, and Kevin Verma</i>	
Parallelization of a Tridimensional Finite Element Program for Structural Behaviour Analysis .....	36
<i>João Coelho, António Silva, and J. Piteira Gomes</i>	
A Comprehensive Empirical Comparison of Parallel ListSieve and GaussSieve .....	48
<i>Artur Mariano, Özgür Dagdelen, and Christian Bischof</i>	
Data Parallelism in Traffic Control Tables with Arrival Information .....	60
<i>Juan F.R. Herrera, Eligius M.T. Hendrix, Leocadio G. Casado, and René Haijema</i>	
Parallel Shared-Memory Multi-Objective Stochastic Search for Competitive Facility Location .....	71
<i>Algirdas Lančinskas, Pilar Martínez Ortigosa, and Julius Žilinskas</i>	
Web Services Based Platform for the Cell Counting Problem .....	83
<i>Juan Carlos Castillo, Francisco Almeida, Vicente Blanco, and M. Carmen Ramírez</i>	
<b>Third Workshop on Big Data Management in Clouds (BigDataCloud 2014)</b>	
Automata-Based Dynamic Data Processing for Clouds .....	93
<i>Reginald Cushing, Adam Belloum, Marian Bubak, and Cees de Laat</i>	

Scientific Workflow Partitioning in Multisite Cloud .....	105
<i>Ji Liu, Vítor Silva, Esther Pacitti, Patrick Valduriez, and Marta Mattoso</i>	
Dynamic Scheduling of MapReduce Shuffle under Bandwidth Constraints .....	117
<i>Sylvain Gault and Christian Perez</i>	
Balanced Graph Partitioning with Apache Spark .....	129
<i>Emanuele Carlini, Patrizio Dazzi, Andrea Esposito, Alessandro Lulli, and Laura Ricci</i>	
<b>12th International Workshop on Algorithms, Models and Tools for Parallel Computing on Heterogeneous Platforms (HeteroPar 2014)</b>	
A Visual Programming Model to Implement Coarse-Grained DSP Applications on Parallel and Heterogeneous Clusters .....	141
<i>Farouk Mansouri, Sylvain Huet, and Dominique Houzet</i>	
Fast Parallel Connected Components Algorithms on GPUs .....	153
<i>Guojing Cong and Paul Muzio</i>	
An Empirical Evaluation of GPGPU Performance Models .....	165
<i>Souley Madougou, Ana Lucia Varbanescu, Cees de Laat, and Rob van Nieuwpoort</i>	
Towards the Transparent Execution of Compound OpenCL Computations in Multi-CPU/Multi-GPU Environments .....	177
<i>Fábio Soldado, Fernando Alexandre, and Hervé Paulino</i>	
Concurrent Data Structures in Architectures with Limited Shared Memory Support .....	189
<i>Ivan Walulya, Yiannis Nikolakopoulos, Marina Papatriantafilou, and Philippas Tsigas</i>	
Optimal Data Partitioning Shape for Matrix Multiplication on Three Fully Connected Heterogeneous Processors .....	201
<i>Ashley DeFlumere and Alexey Lastovetsky</i>	
Scalable SIFT with Scala on NUMA .....	215
<i>Frank Feinbube, Lena Herscheid, Christoph Neijenhuis, and Peter Tröger</i>	
Non-linear Iterative Optimization Method for Locating Particles Using HPC Techniques .....	227
<i>Gloria Ortega, Julia Lobera, Inmaculada García, María del Pilar Arroyo, and Gracia Ester Martín Garzón</i>	

GPU Accelerated Stochastic Inversion of Deep Water Seismic Data .....	239
<i>Tomás Ferreira, Rúben Nunes, Amílcar Soares, Frederico Pratas,     Pedro Tomás, and Nuno Roma</i>	
QCD Library for GPU Cluster with Proprietary Interconnect for GPU Direct Communication .....	251
<i>Norihisa Fujita, Hisafumi Fujii, Toshihiro Hanawa, Yuetsu Kodama,     Taisuke Boku, Yoshinobu Kuramashi, and Mike Clark</i>	
<b>5th Workshop on High-Performance Bioinformatics and Biomedicine (HiBB 2014)</b>	
Mario: Interactive Tuning of Biological Analysis Pipelines Using Iterative Processing .....	263
<i>Martin Ernstsen, Erik Kjærner-Semb, Nils Peder Willassen,     and Lars Ailo Bongo</i>	
Biochemical Application Porting by Interoperating Personal and IaaS Clouds .....	275
<i>Tibor Barat and Attila Kertesz</i>	
<b>Second Workshop on Large-Scale Distributed Virtual Environments on Clouds and P2P (LSDVE 2014)</b>	
The Role of Trusted Relationships on Content Spread in Distributed Online Social Networks .....	287
<i>Valerio Arnaboldi, Massimiliano La Gala, Andrea Passarella,     and Marco Conti</i>	
Comparison of Static and Dynamic Resource Allocations for Massively Multiplayer Online Games on Unreliable Resources .....	299
<i>Radu Prodan, Alexandru Iosup, and Cristian Bologa</i>	
Epidemic Diffusion of Social Updates in Dunbar-Based DOSN .....	311
<i>Marco Conti, Andrea De Salve, Barbara Guidi, and Laura Ricci</i>	
Hierarchical Approach for Green Workload Management in Distributed Data Centers .....	323
<i>Agostino Forestiero, Carlo Mastroianni, Michela Meo,     Giuseppe Papuzzo, and Mehdi Sheikhalishahi</i>	
Network Based Malware Detection within Virtualised Environments .....	335
<i>Pushpinder Kaur Chouhan, Matthew Hagan, Gavin McWilliams,     and Sakir Sezer</i>	
The Impact of Routing Attacks on Pastry-Based P2P Online Social Networks .....	347
<i>Felix A. Eichert, Markus Monhof, and Kalman Graffi</i>	

SLA-Based Cloud Security Monitoring: Challenges, Barriers, Models and Methods .....	359
<i>Dana Petcu</i>	
<b>Second Workshop on Parallel and Distributed Agent-Based Simulations (PADABS 2014)</b>	
A Survey on Parallel and Distributed Multi-Agent Systems .....	371
<i>Alban Rousset, Bénédicte Herrmann, Christophe Lang, and Laurent Philippe</i>	
Resolving Conflicts between Multiple Competing Agents in Parallel Simulations .....	383
<i>Paul Richmond</i>	
Programmability and Performance of Parallel ECS-Based Simulation of Multi-agent Exploration Models .....	395
<i>Alessandro Pellegrini and Francesco Quaglia</i>	
Exploiting D-Mason on Parallel Platforms: A Novel Communication Strategy .....	407
<i>Gennaro Cordasco, Francesco Milone, Carmine Spagnuolo, and Luca Viceromini</i>	
Adaptive Simulation with Repast Simphony and Swift .....	418
<i>Jonathan Ozik, Michael Wilde, Nicholson Collier, and Charles M. Macal</i>	
Towards a Framework for Adaptive Resource Provisioning in Large-Scale Distributed Agent-Based Simulation .....	430
<i>Masatoshi Hanai, Toyotaro Suzumura, Anthony Ventresque, and Kazuyuki Shudo</i>	
Theoretical Nablidot Analysis of Amdahl's Law for Agent-Based Simulations .....	440
<i>Claudio Cioffi-Revilla</i>	
<b>First International Workshop on Reproducibility in Parallel Computing (REPPAR 2014)</b>	
A Semantic-Based Approach to Attain Reproducibility of Computational Environments in Scientific Workflows: A Case Study .....	452
<i>Idafen Santana-Perez, Rafael Ferreira da Silva, Mats Rynge, Ewa Deelman, María S. Pérez-Hernández, and Oscar Corcho</i>	
Reproducible Experiments in Parallel Computing: Concepts and Stencil Compiler Benchmark Study .....	464
<i>Danilo Guerrera, Helmar Burkhart, and Antonio Maffia</i>	

Effective Reproducible Research with Org-Mode and Git . . . . .	475
<i>Luka Stanisic and Arnaud Legrand</i>	
Statistical Validation Methodology of CPU Power Probes . . . . .	487
<i>Abdelhafid Mazouz, Benoît Pradelle, and William Jalby</i>	
Stepping Stones to Reproducible Research: A Study of Current Practices in Parallel Computing . . . . .	499
<i>Alexandra Carpen-Amarie, Antoine Rougier, and Felix D. Lübbe</i>	
<b>7th Workshop on Resiliency in High-Performance Computing with Clouds, Grids, and Clusters (Resilience 2014)</b>	
On Undecidability Aspects of Resilient Computations and Implications to Exascale . . . . .	511
<i>Nageswara S.V. Rao</i>	
An Automated Performance-Aware Approach to Reliability Transformations . . . . .	523
<i>Jacob Lidman, Sally A. McKee, Daniel J. Quinlan, and Chunhua Liao</i>	
The External Recovery Problem . . . . .	535
<i>Arkadiusz Danilecki, Mateusz Hołenko, Anna Kobusińska, and Piotr Zierhoffer</i>	
FlipIt: An LLVM Based Fault Injector for HPC . . . . .	547
<i>Jon Calhoun, Luke Olson, and Marc Snir</i>	
Efficient Reliability in Volunteer Storage Systems with Random Linear Coding . . . . .	559
<i>Ádám Visegrádi and Péter Kacsuk</i>	
What Is the Right Balance for Performance and Isolation with Virtualization in HPC? . . . . .	570
<i>Thomas Naughton, Garry Smith, Christian Engelmann, Geoffroy Vallée, Ferrol Aderholdt, and Stephen L. Scott</i>	
<b>Author Index</b> . . . . .	583

## Table of Contents – Part II

### Second Workshop on Dependability and Interoperability in Heterogeneous Clouds (DIHC 2014)

On the Role of Ontologies in the Design of Service Based Cloud Applications.....	1
<i>Fotis Gonidis, Iraklis Paraskakis, and Anthony J.H. Simons</i>	
Sharing Files Using Cloud Storage Services .....	13
<i>Tiago Oliveira, Ricardo Mendes, and Alysson Bessani</i>	
Next Generation HPC Clouds: A View for Large-Scale Scientific and Data-Intensive Applications .....	26
<i>Dana Petcu, Horacio González-Vélez, Bogdan Nicolae, Juan Miguel García-Gómez, Elies Fuster-Garcia, and Craig Sheridan</i>	
One Click Cloud Orchestrator: Bringing Complex Applications Effortlessly to the Clouds .....	38
<i>Gábor Kecskemeti, Mark Gergely, Ádám Visegrádi, Zsolt Nemeth, József Kovacs, and Péter Kacsuk</i>	
Towards Autonomous Data Sharing Across Personal Clouds .....	50
<i>Roland Tornyai and Attila Kertesz</i>	
Privacy-Preserving Search in Data Clouds Using Normalized Homomorphic Encryption .....	62
<i>Mohanad Dawoud and D. Turgay Altılar</i>	

### Second Workshop on Federative and Interoperable Cloud Infrastructures (FedICI 2014)

Integrated Management of IaaS Resources.....	73
<i>Fernando Meireles and Benedita Malheiro</i>	
Performance Investigation and Tuning in the Interoperable Cloud4E Platform .....	85
<i>Steffen Limmer, Maik Srba, and Dietmar Fey</i>	
Cloud Federation to Elastically Increase MapReduce Processing Resources .....	97
<i>Alfonso Panarello, Maria Fazio, Antonio Celesti, Antonio Puliafito, and Massimo Villari</i>	

A Novel Approach for Performance Characterization of IaaS Clouds . . . . .	109
<i>Sandor Acs, Nemeth Zsolt, and Mark Gergely</i>	
<b>7th International Workshop on Multi-/Many-core Computing Systems (MuCoCoS 2014)</b>	
ExaStamp: A Parallel Framework for Molecular Dynamics on Heterogeneous Clusters . . . . .	121
<i>Emmanuel Cieren, Laurent Colombe, Samuel Pitoiset, and Raymond Namyst</i>	
Optimized Selection of Runtime Mode for the Reconfigurable PRAM-NUMA Architecture REPLICA Using Machine-Learning . . . . .	133
<i>Erik Hansson and Christoph Kessler</i>	
A Study of the Potential of Locality-Aware Thread Scheduling for GPUs . . . . .	146
<i>Cedric Nugteren, Gert-Jan van den Braak, and Henk Corporaal</i>	
OpenCL Performance Portability for Xeon Phi Coprocessor and NVIDIA GPUs: A Case Study of Finite Element Numerical Integration . . . . .	158
<i>Krzysztof Banaś and Filip Krużel</i>	
Eve: A Parallel Event-Driven Programming Language . . . . .	170
<i>Alcides Fonseca, João Rafael, and Bruno Cabral</i>	
Dependency-Based Automatic Parallelization of Java Applications . . . . .	182
<i>João Rafael, Ivo Correia, Alcides Fonseca, and Bruno Cabral</i>	
A Scalable Parallel Approach for Subgraph Census Computation . . . . .	194
<i>David Aparicio, Pedro Paredes, and Pedro Ribeiro</i>	
Lace: Non-blocking Split Deque for Work-Thieving . . . . .	206
<i>Tom van Dijk and Jaco C. van de Pol</i>	
Evaluating Execution Time Predictability of Task-Based Programs on Multi-Core Processors . . . . .	218
<i>Thomas Grass, Alejandro Rico, Marc Casas, Miquel Moreto, and Alex Ramirez</i>	
SchedMon: A Performance and Energy Monitoring Tool for Modern Multi-cores . . . . .	230
<i>Luís Taniça, Aleksandar Ilic, Pedro Tomás, and Leonel Sousa</i>	
Exploiting Hidden Non-uniformity of Uniform Memory Access on Manycore CPUs . . . . .	242
<i>Balazs Gerofi, Masamichi Takagi, and Yutaka Ishikawa</i>	

## Third Workshop on On-chip Memory Hierarchies and Interconnects (OMHI 2014)

Characterization of a List-Based Directory Cache Coherence Protocol for Manycore CMPs .....	254
<i>Ricardo Fernández-Pascual, Alberto Ros, and Manuel E. Acacio</i>	
Coarse/Fine-grained Approaches for Pipelining Computing Stages in FPGA-Based Multicore Architectures .....	266
<i>Ali Azarian and João M.P. Cardoso</i>	

Improving Energy and Performance with Spintronics Caches in Multicore Systems .....	279
<i>William Tuohy, Cong Ma, Pushkar Nandkar, Nishant Borse, and David J. Lilja</i>	

## 7th Workshop on Productivity and Performance Tools for HPC Application Development (PROPER 2014)

Performance Measurement for the OpenMP 4.0 Offloading Model .....	291
<i>Robert Dietrich, Felix Schmitt, Alexander Grund, and Dirk Schmidl</i>	
Bypassing the Conventional Software Stack Using Adaptable Runtime Systems .....	302
<i>Simon Andreas Frimann Lund, Mads R.B. Kristensen, Brian Vinter, and Dimitrios Katsaros</i>	

## Second Workshop on Runtime and Operating Systems for the Many-Core Era (ROME 2014)

Comparison of Three Popular Parallel Programming Models on the Intel Xeon Phi .....	314
<i>Ashkan Tousimojarad and Wim Vanderbauwhede</i>	
Exploring the Throughput-Fairness Trade-off on Asymmetric Multicore Systems .....	326
<i>Juan Carlos Saez, Adrian Pousa, Fernando Castro, Daniel Chaver, and Manuel Prieto-Matías</i>	
Assembly Operations for Multicore Architectures Using Task-Based Runtime Systems .....	338
<i>Damien Genet, Abdou Guermouche, and George Bosilca</i>	
Shared Memory in the Many-Core Age .....	351
<i>Stefan Nürnberg, Gabor Drescher, Randolph Rotta, Jörg Nolte, and Wolfgang Schröder-Preikschat</i>	

**First Workshop on Techniques and Applications  
for Sustainable Ultrascale Computing Systems  
(TASUS 2014)**

The PerSyst Monitoring Tool: A Transport System for Performance Data Using Quantiles .....	363
<i>Carla Guillen, Wolfram Hesse, and Matthias Brehm</i>	
A Cloudification Methodology for Numerical Simulations .....	375
<i>Silvina Caíno-Lores, Alberto García, Félix García-Carballera, and Jesús Carretero</i>	
Paralldroid: Performance Analysis of GPU Executions .....	387
<i>Alejandro Acosta and Francisco Almeida</i>	
Accurate Blind Predictions of OpenFOAM Energy Consumption Using the LBM Prediction Model .....	400
<i>Davide Morelli and Antonio Cisternino</i>	
High-Level Topology-Oblivious Optimization of MPI Broadcast Algorithms on Extreme-Scale Platforms .....	412
<i>Khalid Hasanov, Jean-Noël Quintin, and Alexey Lastovetsky</i>	
<b>7th Workshop on UnConventional High-Performance Computing (UCHPC 2014)</b>	
Improving Node-Level MapReduce Performance Using Processing-in-Memory Technologies .....	425
<i>Mahzabeen Islam, Marko Scrbak, Krishna M. Kavi, Mike Ignatowski, and Nuwan Jayasena</i>	
On Portability, Performance and Scalability of an MPI OpenCL Lattice Boltzmann Code .....	438
<i>Enrico Calore, Sebastiano Fabio Schifano, and Raffaele Tripiccione</i>	
Matrix-Free Finite-Element Operator Application on Graphics Processing Units .....	450
<i>Karl Ljungkvist</i>	
Dynamic Load Balancing with Pair Potentials .....	462
<i>Jean-Charles Papin, Christophe Denoual, Laurent Colombe, and Raymond Namyst</i>	
Analysis of Parallel Applications on a High Performance–Low Energy Computer .....	474
<i>Florina M. Ciorba, Thomas Ilsche, Elke Franz, Stefan Pfennig, Christian Scheunert, Ulf Markwardt, Joseph Schuchart, Daniel Hackenberg, Robert Schöne, Andreas Knüpfer, Wolfgang E. Nagel, Eduard A. Jorswieck, and Matthias S. Müller</i>	

## 9th Workshop on Virtualization in High-Performance Cloud Computing (VHPC 2014)

Migration Techniques in HPC Environments .....	486
<i>Simon Pickartz, Ramy Gad, Stefan Lankes, Lars Nagel, Tim Süß, André Brinkmann, and Stephan Krempel</i>	
Planning Live-Migrations to Prepare Servers for Maintenance .....	498
<i>Vincent Kherbache, Eric Madelaine, and Fabien Hermenier</i>	
Virtual Cluster Deployment with Dynamically Detachable Remote Shared Storage .....	508
<i>Yusuke Tanimura and Takahiro Hamanishi</i>	
Hecatonchire: Towards Multi-host Virtual Machines by Server Disaggregation .....	519
<i>Petter Svärd, Benoit Hudzia, Johan Tordsson, and Erik Elmroth</i>	

## Workshop on Software for Exascale Computing (SPPEXA 2014)

EXA-DUNE: Flexible PDE Solvers, Numerical Methods and Applications .....	530
<i>Peter Bastian, Christian Engwer, Dominik Göddeke, Oleg Iliev, Olaf Ippisch, Mario Ohlberger, Stefan Turek, Jorrit Fahlke, Sven Kaulmann, Steffen Müthing, and Dirk Ribbrock</i>	
DASH: Data Structures and Algorithms with Support for Hierarchical Locality .....	542
<i>Karl Fürlinger, Colin Glass, Jose Gracia, Andreas Knüpfer, Jie Tao, Denis Hünich, Kamran Idrees, Matthias Maiterth, Yousri Mhedheb, and Huan Zhou</i>	
ExaStencils: Advanced Stencil-Code Engineering .....	553
<i>Christian Lengauer, Sven Apel, Matthias Bolten, Armin Größlinger, Frank Hannig, Harald Köstler, Ulrich Rüde, Jürgen Teich, Alexander Grebhahn, Stefan Kronawitter, Sebastian Kuckuk, Hannah Rittich, and Christian Schmitt</i>	
EXAHD: An Exa-scalable Two-Level Sparse Grid Approach for Higher-Dimensional Problems in Plasma Physics and Beyond .....	565
<i>Dirk Pflüger, Hans-Joachim Bungartz, Michael Griebel, Frank Jenko, Tilman Dannert, Mario Heene, Christoph Kowitz, Alfredo Parra Hinojosa, and Peter Zaspel</i>	

ESSEX: Equipping Sparse Solvers for Exascale .....	577
<i>Andreas Alvermann, Achim Basermann, Holger Fehske, Martin Galgon, Georg Hager, Moritz Kreutzer, Lukas Krämer, Bruno Lang, Andreas Pieper, Melven Röhrig-Zöllner, Faisal Shahzad, Jonas Thies, and Gerhard Wellein</i>	
Catwalk: A Quick Development Path for Performance Models .....	589
<i>Felix Wolf, Christian Bischof, Torsten Hoefler, Bernd Mohr, Gabriel Wittum, Alexandru Calotoiu, Christian Iwainsky, Alexandre Strube, and Andreas Vogel</i>	
Task-Based Programming with OmpSs and Its Application .....	601
<i>Alejandro Fernández, Vicenç Beltran, Xavier Martorell, Rosa M. Badia, Eduard Ayguadé, and Jesus Labarta</i>	
<b>Author Index</b> .....	613