

Jesus Carretero et al. (Eds.)

Algorithms and Architectures for Parallel Processing

ICA3PP 2016 Collocated Workshops:
SCDT, TAPEMS, BigTrust, UCER, DLMCS
Granada, Spain, December 14–16, 2016
Proceedings

Contents

TAPEMS 2016: International Workshop in Theoretical Approaches to Performance Evaluation, Modeling, and Simulation

OTFX: An In-memory Event Tracing Extension to the Open Trace Format 2	3
<i>Michael Wagner, Andreas Knüpfer, and Wolfgang E. Nagel</i>	
Tuning the Blocksize for Dense Linear Algebra Factorization Routines with the Roofline Model	18
<i>Peter Benner, Pablo Ezzatti, Enrique S. Quintana-Ortí, Alfredo Remón, and Juan P. Silva</i>	
Network-Aware Optimization of MPDATA on Homogeneous Multi-core Clusters with Heterogeneous Network	30
<i>Tania Malik, Lukasz Szustak, Roman Wyrzykowski, and Alexey Lastovetsky</i>	
Formalizing Data Locality in Task Parallel Applications	43
<i>Germán Ceballos, Erik Hagersten, and David Black-Schaffer</i>	
Improving the Energy Efficiency of Evolutionary Multi-objective Algorithms	62
<i>J.J. Moreno, G. Ortega, E. Filatovas, J.A. Martínez, and E.M. Garzón</i>	
A Parallel Model for Heterogeneous Cluster	76
<i>Thiago Marques Soares, Rodrigo Weber dos Santos, and Marcelo Lobosco</i>	
Comparative Analysis of OpenACC Compilers	91
<i>Daniel Barba, Arturo Gonzalez-Escribano, and Diego R. Llanos</i>	

BigTrust 2016: The 1st International Workshop on Trust, Security and Privacy for Big Data

The Research of Recommendation System Based on User-Trust Mechanism and Matrix Decomposition	107
<i>PanPan Zhang and Bin Jiang</i>	
Traffic Sign Recognition Based on Parameter-Free Detector and Multi-modal Representation	115
<i>Gu Mingqin, Chen Xiaohua, Zhang Shaoyong, and Ren Xiaoping</i>	

Reversible Data Hiding Using Non-local Means Prediction	125
<i>Yingying Fang and Bo Ou</i>	
Secure Data Access in Hadoop Using Elliptic Curve Cryptography	136
<i>Antonio F. Díaz, Ilia Blokhin, Julio Ortega, Raúl H. Palacios, Cristina Rodríguez-Quintana, and Juan Díaz-García</i>	
Statistical Analysis of CCM.M-K1 International Comparison Based on Monte Carlo Method.	146
<i>Chang-qing Cai, Xiao-ping Ren, Guo-dong Hao, Jian Wang, and Tao Huang</i>	
First International Workshop on Data Locality in Modern Computing Systems (DLMCS 2016)	
Redundancy Elimination in the ExaStencils Code Generator	159
<i>Stefan Kronawitter, Sebastian Kuckuk, and Christian Lengauer</i>	
A Dataflow IR for Memory Efficient RIPL Compilation to FPGAs	174
<i>Robert Stewart, Greg Michaelson, Deepayan Bhowmik, Paulo Garcia, and Andy Wallace</i>	
Ultrascale Computing for Early Researchers (UCER 2016)	
Exploring a Distributed Iterative Reconstructor Based on Split Bregman Using PETSc	191
<i>Estefania Serrano, Tom Vander Aa, Roel Wuyts, Javier Garcia Blas, Jesus Carretero, and Monica Abella</i>	
Implementation of the Beamformer Algorithm for the NVIDIA Jetson	201
<i>Fran J. Alventosa, Pedro Alonso, Gema Piñero, and Antonio M. Vidal</i>	
MARL-Ped+Hitmap: Towards Improving Agent-Based Simulations with Distributed Arrays	212
<i>Eduardo Rodríguez-Gutierrez, Francisco Martínez-Gil, Juan Manuel Orduña, and Arturo Gonzalez-Escribano</i>	
Efficiency of GPUs for Relational Database Engine Processing.	226
<i>Samuel Cremer, Michel Bagein, Saïd Mahmoudi, and Pierre Manneback</i>	
Geocon: A Middleware for Location-Aware Ubiquitous Applications.	234
<i>Loris Belcastro, Giulio Di Lieto, Marco Lackovic, Fabrizio Marozzo, and Paolo Trunfio</i>	
I/O-Focused Cost Model for the Exploitation of Public Cloud Resources in Data-Intensive Workflows	244
<i>Francisco Rodrigo Duro, Javier Garcia Blas, and Jesus Carretero</i>	

SCDT-2016: Supercomputing Co-Design Technology Workshop

Cellular ANTomata as Engines for Highly Parallel Pattern Processing 261
Arnold L. Rosenberg

Educational and Research Systems for Evaluating the Efficiency of Parallel Computations 278
Victor Gergel, Evgeny Kozinov, Alexey Linev, and Anton Shtanyk

Generalized Approach to Scalability Analysis of Parallel Applications 291
Alexander Antonov and Alexey Teplov

System Monitoring-Based Holistic Resource Utilization Analysis for Every User of a Large HPC Center 305
Dmitry Nikitenko, Konstantin Stefanov, Sergey Zhumatiy, Vadim Voevodin, Alexey Teplov, and Pavel Shvets

Co-design of a Particle-in-Cell Plasma Simulation Code for Intel Xeon Phi: A First Look at Knights Landing 319
Igor Surmin, Sergey Bastrakov, Zakhar Matveev, Evgeny Efimenko, Arkady Gonoskov, and Iosif Meyerov

Efficient Distributed Computations with DIRAC 330
Viktor Gergel, Vladimir Korenkov, Andrei Tsaregorodtsev, and Alexey Svistunov

The Co-design of Astrophysical Code for Massively Parallel Supercomputers 342
Boris Glinsky, Igor Kulikov, Igor Chernykh, Dmitry Weins, Alexey Snytnikov, Vladislav Nenashev, Andrey Andreev, Vitaly Egunov, and Egor Kharkov

Hardware-Specific Selection the Most Fast-Running Software Components. . . 354
Alexey Sidnev

Automated Parallel Simulation of Heart Electrical Activity Using Finite Element Method 365
Andrey Sozykin, Timofei Epanchintsev, Vladimir Zverev, Svyatoslav Khamzin, and Aleksandr Bersenev

Using hStreams Programming Library for Accelerating a Real-Life Application on Intel MIC 373
Lukasz Szustak, Kamil Halbiniak, Adam Kulawik, Roman Wyrzykowski, Piotr Uminski, and Marcin Sasinowski

Author Index 383