

5th International Young Scientist Conference on Computational Science (YSC 2016)

Procedia Computer Science Volume 101

Krakow, Poland
26 - 28 October 2016

Editors:

Alexander Boukhanovsky
Marian Bubak
Marina Balakhontceva

ISBN: 978-1-5108-3352-4

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© by Elsevier B.V.
All rights reserved.

Printed by Curran Associates, Inc. (2017)

For permission requests, please contact Elsevier B.V.
at the address below.

Elsevier B.V.
Radarweg 29
Amsterdam 1043 NX
The Netherlands

Phone: +31 20 485 3911
Fax: +31 20 485 2457

<http://www.elsevierpublishingsolutions.com/contact.asp>

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
Email: curran@proceedings.com
Web: www.proceedings.com

Contents

Computational Science through the Eyes of Youth: The Foreword A. Boukhanovsky, M. Bubak, M. Balakhontseva, A. Bilyatdinova	1
Why is it Hard to Describe Properties of Algorithms? V. Voevodin, A. Antonov, J. Dongarra	4
Fast Parallel Integration for Three Dimensional Discontinuous Petrov Galerkin Method M. Woźniak, M. Łoś, M. Paszyński, L. Demkowicz	8
Development of Parallel Block Multistage Scheme of Dimension Reduction for Globalizer Lite Parallel Software System A. Zhbanova	18
Local Tuning in Peano Curves-based Global Optimization Scheme V.V. Sovrasov	27
Parallel Simulation of Adaptive Random Boolean Networks K. Kuvshinov, K. Bochenina, P.J. Górski, J.A. Hołyst	35
New Approaches to Parallelization in Filters Aggregation Based Feature Selection Algorithms I. Smetannikov, I. Isaev, A. Filchenkov	45
Application of Numerical time Integration Schemes to Continuously Variable Transmission Dynamics Analysis S. Orlov, A. Kuzin, N. Melnikova, N. Shabrov	53
A New Approach for Modeling of Conformational Changes of Multi Chain Proteins E. Lutsenko, S. Knyazev, Y. Porozov	58
Parallel Simulation of Scroll Wave Dynamics in the Human Heart Using the FEniCS Framework T. Epanchintsev, S. Pravdin, A. Sozykin, V. Zverev	68
Computer Simulation Approach in Development of Propane-air Combustor Microreactor S.A. Konakov, S.V. Dzyubanenko, V.V. Krzhizhanovskaya	76
Who Should be my Facebook Partner? Analysis of the Relationship between Hungarian Large-scale Facebook Pages P. Szolnoki, M. Ilyés, L. Gulyás, G. Kampis	86
From MDMA to Lady Gaga: Expertise and Contribution Behavior of Editing Communities on Wikipedia L.J. Dijkstra, L.J. Krieg	96
Political Parties on Facebook J. Biró, L. Gulyás, G. Kampis	107
Multitenant Approach to Crawling of Online Social Networks N. Butakov, M. Petrov, A. Radice	115
A Comparison of Methods to Detect People Flow Using Video Processing A.V. Kurilkin, S.V. Ivanov	125
Machine Learning Models of Text Categorization by Author Gender Using Topic-Independent Features A. Sboev, T. Litvinova, D. Gudovskikh, R. Rybka, I. Moloshnikov	135
Simulation of Patient Flow and Load of Departments in a Specialized Medical Center T.M. Abuhay, A.V. Krikunov, E.V. Bolgova, L.G. Ratova, S.V. Kovalchuk	143
Dijkstra-based Terrain Generation Using Advanced Weight Functions K. Golubev, A. Zagarskikh, A. Karsakov	152
Immune System Model Calibration by Genetic Algorithm A. Presbitero, V. Krzhizhanovskaya, E. Mancini, R. Brands, P. Sloot	161
Preoperational Time Prediction for Percutaneous Coronary Intervention Using Machine Learning Techniques A. Funkner, S. Kovalchuk, K. Bochenina	172
Adaptation of Population Structure in Socio-cognitive Particle Swarm Optimization I. Bugajski, A. Byrski, M. Kisiel-Dorohinicki, T. Lenaerts, D. Samson, B. Indurkha	177
On the Applicability of Spiking Neural Network Models to Solve the Task of Recognizing Gender Hidden in Texts A. Sboev, T. Litvinova, D. Vlasov, A. Serenko, I. Moloshnikov	187
Modeling Transport Accessibility with Open Data: Case Study of St. Petersburg A.A. Lantseva, S.V. Ivanov	197
Traffic Estimation on Full Graph of Transport Network Using GPS Data of Bus Movements I. Derevitskiy, D. Voloshin, L. Mednikov, V. Karbovskii	207
Geospatial Data Generation and Preprocessing Tools for Urban Computing System Development A. Golubev, I. Chechetkin, D. Parygin, A. Sokolov, M. Shcherbakov	217

Applied Problems of Polyhedron Inscribing Task Solving D. Kokorev, N. Piskovatskii	227
Subsystem of Patent Information Analysis at the Stage of Conceptual Design of Management Systems Elements I. Petrova, A. Puchkova, V. Zaripova	233
Monitoring of Social Reactions to Support Decision Making on Issues of Urban Territory Management S. Ustugova, D. Parygin, N. Sadovnikova, A. Finogeev, A. Kizim	243
Simulating an Impact of Road Network Improvements on the Performance of Transportation Systems under Critical Load: Agent-based Approach D. Milevich, V. Melnikov, V. Karbovskii, V. Krzhizhanovskaya	253
Optimal Methods for Retrofitting Corrosion-Damaged Reinforced Concrete Columns H. Eskandari-Naddaf, M. Lezgy-Nazargah, H. Bakhshi	262
Statistics-based Models of Flood-causing Cyclones for the Baltic Sea Region N.O. Nikitin, D.S. Spirin, A.A. Visheratin, A.V. Kalyuzhnaya	272
Influenza Outbreaks Forecasting in Russian Cities: Is Baroyan-rvachev Approach Still Applicable? V.N. Leonenko, Y.K. Novoselova, K.M. Ong	282
Numerical Modeling of Freeform Refractive Surfaces Forming Line Radiation Pattern Y. Mazur, A. Voznesenskaya	292
Intelligent Oilfield Model I.S. Korovin, M.G. Tkachenko	300
Kademlia with Consistency Checks as a Foundation of Borderless Collaboration in Open Science Services M. Żmuda, Ł. Opióła, Ł. Dutka, R. Słota, J. Kitowski	304
Distributed Optimization on the Base of AMPL Modeling Language and Everest Platform S. Smirnov, V. Voloshinov, O. Sukhoroslov	313
Quality-based Workload Scaling for Real-time Streaming Systems P.A. Smirnov, D. Nasonov	323
Optimization of Distributed Data Processing System for NICA BM@N Experiment by Using Simulation V. Korenkov, A. Nechaevskiy, G. Ososkov, Y. Potrebenikov, D. Pryahina, V. Trofimov, A. Uzhinskiy	333
Distributed Monitoring System for Reconfigurable Computer Systems I.G. Danilov, A.I. Dordopulo, Z.V. Kalyaev, I.I. Levin, V.A. Gudkov, A.A. Gulenok, A.V. Bovkun	341
Implementing, Evaluating and Extending the Model of LIT Cloud Infrastructure at JINR V. Airriian, V. Korenkov, A. Nechaevskiy	351
Integration and Combined Use of Distributed Computing Resources with Everest S. Smirnov, O. Sukhoroslov, S. Volkov	359
BOINC Forks, Issues and Directions of Development I. Kurochkin, A. Saevskiy	369
Data Preloading and Data Placement for MapReduce Performance Improving A. Spivak, D. Nasonov	379
Automatic Workflow Scheduling Tuning for Distributed Processing Systems A.A. Visheratin, M. Melnik, D. Nasonov	388
E-participation Tools in Science and Business Sphere Implementation: The Case of XPIR-Platform for Participation in Education Policy L. Vidasova, P. Kachurina, S. Ivanov, G. Smith	398
Temporal Branching Approach for Visual Exploration of Simulation Process in Dynamic Networks K. Mukhina, V. Guleva, A. Karsakov	407
Graph-based Framework for 3-D Vascular Dynamics Simulation R. Łazarz	416
The Tool for Supercomputer’s Users’ Traffic Accounting and Analysis K. Enokyan	425
A Project of Compiler for a Processor with Programmable Accelerator B. Ya. Steinberg, A.P. Bugliy, D.V. Dubrov, Y.V. Mikhailuts, O.B. Steinberg, R.B. Steinberg	435
An Approach to Hybrid Learning Resource Design for Training Professionals in Computational Science K. Bochenina, A. Dukhanov, M. Karpova, V. Shmelev	439
Big Data and Artificial Intelligence for Digital Humanities: An International Master Program via Trans-urasian Universities Network A. Dukhanov, A. Boukhanovsky, T. Sidorova, N. Spitsyna	449