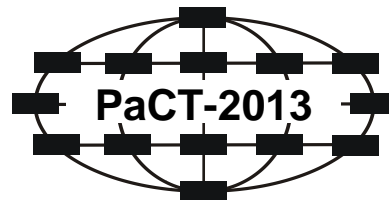

PARALLEL COMPUTING TECHNOLOGIES



PaCT-2013

Twelfth International Conference

St.-Peterburg, Russia

September 30 - October 4, 2013

PROGRAM

Sponsored by
Russian Fund for Basic Research,
Russian Academy of Science,
Ministry of Education and Science of RF,
Intel Corporation,
RSC Group,
Trinity Group.
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St.-Petersburg 2013

MONDAY, September 30

EU-Russia HPC workshop

Organizers:

EU:
Mateo Valero, Panos Tsarchopoulos,
Fabrizio Gagliardi

RUSSIA:
Dmitry Raychuk, Victor Malyshkin,
Nikolay Shabrov, Maxim Gorodnichev

1) <i>Mateo Valero, Future of HPC in Europe</i>	14:00
2) <i>Russian HPC speaker (RSC Group)</i>	14:45
3) <i>Panos Tsarchopoulos, EU Horizon 2020</i>	15:30
4) <i>Russia Ministry representative</i>	16:00
<i>Coffee Break</i>	16:30
5) <i>Project PIs presentations</i>	17:00
6) <i>Panel Discussion. Fabrizio Gagliardi, moderator</i>	17:40
7) <i>HPC industry presentations (Trinity Group)</i>	18:10
PaCT-2013 WELCOME PARTY	19:00

TUESDAY, October 1

Registration	9:00-10:40
Welcome Coffee	10:00-10:40
OPENING SESSION	10:40-12:30
Dmitry Raychuk, SPbSTU <i>Vice-Chancellor</i>	10:40-10:45
N.N.Shabrov, SPbSTU, <i>Organizing Committee Chairman</i>	10:45-10:48
Victor Malyshkin, <i>Program Committee Chairman</i>	10:48-10:50
cupSODA: a CUDA-powered Simulator of Mass-Action Kinetics <i>Marco Nobile, Daniela Besozzi, Paolo Cazzaniga, Giancarlo Mauri, Dario Pescini</i>	10:50-11:20
SkelCL: Enhancing OpenCL for High-Level Programming of Multi-GPU Systems <i>Michel Steuwer, Sergei Gorlatch</i>	11:20-11:50
Slot Selection Algorithms in Distributed Computing with Non-dedicated and Heterogeneous Resources <i>Victor Toporkov, Anna Toporkova, Alexey Tselishchev, Dmitry Yemelyanov</i>	11:50-12:10
GENERAL ANNOUNCEMENTS AND PHOTO SESSION	12:10-12:30
LUNCH	12:30-14:00
APPLICATIONS	Chairman Sergei Gorlatch 14:00-15:30

Reconstructing images with Nature inspired algorithms <i>Franciszek Seredynski, Jaroslaw Skaruz</i>	14:00-14:30
<u>Invited Talk: Robust Computing Systems</u> <i>Howard J. Siegel.</i>	14:30-15:00
SVM Regression Parameters Optimization Using Parallel Global Search Algorithm <i>Alexey Polovinkin, Iosif Meyerov, Konstantin Barkalov, Nikolai Zolotykh, Sergey Sidorov</i>	15:00-15:30
COFFEE BREAK	15:30-16:00
PROGRAMMING I Chairman Pierpaolo Degano	16:00-17:10
Transitive closure of a union of dependence relations for parameterized perfectly-nested loops <i>Wlodzimierz Bielecki, Krzysztof Kraska, Tomasz Klimek</i>	16:00-16:30
Killer-mobiles: the way towards energy efficient High Performance Computers? <i>Mateo Valero (keynote speaker)</i>	16:30-16:55
Parallelization Properties of Preconditioners for the Conjugate Gradient Methods <i>Oleg Bessonov</i>	16:55-17:15
MathCloud: Publication and Reuse of Scientific Applications as RESTful Web Services <i>Alexander Afanasiev, Oleg Sukhoroslov, Vladimir Voloshinov</i>	17:15-17:35

WEDNESDAY October 2

THEORY Chairman Hiroshi Umeo	9.00-10.30
Cli-Edge Consensus: Agreeing on the Precipice <i>Francois Taiani, Barry Porter, Geoff Coulson, Michel Raynal</i>	9.00-9.30
Secure and Unfailing Services <i>Pierpaolo Degano, Davide Basile, Gian-Luigi Ferrari</i>	9.30-10:00
Timed Resource Driven Automata Nets for Distributed Real-Time Systems Modelling, <i>Vladimir Bashkin, Irina Lomazova, Yulia Novikova</i>	10:00-10:30
COFFEE BREAK	10:30-11:00
PROGRAMMING II Chairman Dominique Désérable	11:00-12:30
Multi-core Implementation of Decomposition-based Packet Classification Algorithms <i>Shijie Zhou, Yun R. Qu, Viktor Prasanna</i>	11:00-11:30
<u>Invited Talk: Bi-Objective Optimization for Scheduling in Parallel Computing Systems</u> <i>Anthony A. Maciejewski</i>	11:30-12:00
Fast and Scalable, Lock-free k-FIFO Queues <i>Christoph M. Kirsch, Michael Lippautz, Hannes Payer</i>	12:00-12:30

LUNCH	12:30-14:00
CELLURA AUTOMATA Chairman Rolf Hoffmann	14:00-15:40
An Isotropic Optimum-Time FSSP Algorithm for Two-Dimensional Cellular Automata <i>Umeo Hiroshi</i>	14:00-14:30
3-D Cellular Automata model of Fluid Permeation through Porous Material <i>Olga Bandman</i>	14:30-15:00
Analysis and Application of the Pedestrian Permeation Through the Crowd via Cellular Automata <i>Kenichiro Shimura, Stefania Bandini, Katuhiro Nishinari</i>	15:00-15:20
Parallel Implementation of Totalistic Cellular Automata Model of Stable Patterns Formation <i>Anastasiya Kireeva</i>	15:20-15:40
COFFEE BREAK & POSTERS	15:40-17:10
<ol style="list-style-type: none"> 1. Strassen's Communication-Avoiding Parallel Matrix Multiplication Algorithm for All-Port 2D Torus Networks <i>Cesur Baransel</i> 2. Temporal-impulse description of complex images based on cellular automata <i>Stepan Belan, Nikolay Belan</i> 3. OPTNOC: An Optimized 3D Network-on-Chip Design for Fast Memory Access <i>Thomas Canhao Xu, Pasi Liljeberg, Juha Plosila, Hannu Tenhunen</i> 4. The Cellular Automata Model of Some Organisms Population in Lake Baikal <i>Ivan Afanasyev</i> 5. Determination of dependence of performance from specifications of separate components of the hybrid personal computing system based on GPU-processors <i>Daulet Akhmedov, Suleimen Yelubayev, Timur Bopoyev, Farida Abdoldina, Daulet Muratov, Rustam Povetkin, Aibek Karataev</i> 6. The unified algorithmic platform for solving complex problems of computational geometry <i>Vasyl Tereshchenko</i> 7. Development of basic approach and software package for effective parallel computing of continuum mechanics problems on hybrid architecture systems <i>Maksim Klimov</i> 8. TCP TIPS: TCP Variant with Proactive Congestion Avoidance <i>Anatoliy Sivov</i> 9. On-line parallelizable task scheduling on parallel processors <i>Marina Khludova</i> 10. PowerVisor: A Toolset for Visualizing Energy Consumption and Heat Dissipation Processes in Modern Processor Architectures <i>Alexey Baranov, Peter Panfilov, Dmitry Ponomarev</i> 11. Rigid Body Molecular Dynamics within the Domain Decomposition framework of DL_POLY_4 <i>Ilian Todorov, Laurence Ellison, William Smith</i> 	
THURSDAY	October 3

SOCIAL DAY

A tour to Tsarskoye Selo with a visit to the Catherine Palace and the Amber Room

Saint-Petersburg boat tour
Conference Dinner

FRIDAY **October 4**

FINE GRAIN COMPUTATIONS Chairman Olga Bandman **9:00-10:30**

CA Agents for All-to-All Communication are Faster in the Triangulate Grid **9:00-9:30**
Dominique Deserable, Rolf Hoffmann

3D Heart modeling with cellular automata, mass-spring system and CUDA **9:30-10:00**
Ricardo Campos, Ronan Amorim, Bernardo Oliveira, Joakim Sundnes, Luis Paulo Barra, Marcelo Lobosco, Rodrigo Santos

Towards the Introduction of Parallelism in the MakkSim Pedestrian Simulator **10:00-10:20**
Luca Crociani, Giuseppe Vizzari, Stefania Bandini

COFFEE BREAK **10:20-10:40**

PROGRAMMING TOOLS AND SUPPORT Chairman Victor Toporkov **10:40-12:00**

FuPerMod: a Framework for Optimal Data Partitioning for Parallel Scientific Applications on Dedicated Heterogeneous HPC Platforms **10:40-11:10**
Vladimir Rychkov, Alexey Lastovetsky

Characterization and Understanding Machine-Specific Interconnects **11:10-11:30**
Vitali Morozov, Jiayuan Meng

How to develop for Intel® Xeon Phi. Program solutions from Intel for HPC **11:30-11:50**
Gennady Fedorov (Intel)

Design of distributed parallel computing using by MAPREDUCE/MPI technology **11:50-12:10**
Darkhan Akhmed-Zaki, Bolatzhan Kumalakov, Bazargul Matkerim, Nargozy Danaev, Amanzhol Bektemessov

LUNCH **12:10-14:00**

Meeting of the Program Committee **12:10-14:00**

- General discussion
- Papers selection for the special issue of an int. journal

COMPUTER PROGRAMMING Chairman Dominique Deserable **14:00-15:30**

Formal Verification of Programs in the Pifagor Language **14:00-14:30**
Mariya Kropacheva, Alexander Legalov

Efficient domain decomposition of dissipative particle dynamics via choice of pseudorandom number generator **14:30-14:50**
Michael Seaton, Ilian Todorov, Yaser Afshar

DISBench: Benchmark for Memory Performance Evaluation of Multicore Multiprocessors **14:50-15:10**
Alexander Frolov, Mikhail Gilmendinov

SeloGPU: A Selective Off-loading framework for High Performance GPGPU execution **15:10-15:30**

COFFEE BREAK	15:30-15:50
PROGRAMMING & APPLICATIONS Chairman Nikolay Shabrov	15:50-17:10
	15:50-16:20
Hybrid Solver Based on Schur Complement Method for Multi-GPU <i>Sergey Kopysov, Igor Kuzmin, Nikita Nedozhogin, Alexander Novikov, Yulia Sagdeeva</i>	
Enhanced Differential Evolution Entirely Parallel Method for Biomedical Applications <i>K.Kozlov, .N.Ivanisenko, V.Ivanisenko, M.Samsonova, N.Kolchanov, A.Samsonov</i>	16:20-16:40
Organizing of parallel processing user-friendly dataflow-oriented environment for user tasks execution on cluster <i>Daria Odyakova, Dmitry Kharitonov, Vladimir Levin</i>	16:40-17:00
CLOSING SESSION	17:00-17:10