

Proceedings of the

International Symposium on Parallel and Distributed Computing

1-5 July 2008 / Krakow, Poland



Los Alamitos, California
Washington • Tokyo



TABLE OF CONTENTS

INVITED RESEARCH PAPERS

Finding Speedup in Parallel Processors	1
<i>Michael Flynn, R. Dimond, O. Mencer, O. Pell</i>	
Holistic Design of Multiple-Core Architectures	6
<i>Dean M. Tullsen</i>	
Computing with Condensed Graphs	8
<i>John Morrison</i>	
Semantic Approach to Capability and Capacity Computing	18
<i>Jacek Kitowski</i>	

PERFORMANCE MANAGEMENT IN PARALLEL AND DISTRIBUTED SYSTEMS

Software Probes: Towards a Quick Method for Machine Characterization and Application Performance Prediction.....	19
<i>Alexandre Otto Stube, Dolores Rexachs, Emilio Luque</i>	
A Flexible Monitoring and Notification System for Distributed Resources.....	27
<i>Garry Smith, Mark Baker</i>	
The Analysis of Influence of IBM pSeries Servers' Virtualization Mechanism on Dynamic Resources Allocation in AIX 5L.....	35
<i>Maciej Mlynski</i>	

PARALLEL AND DISTRIBUTED APPLICATIONS

Scalable Dense Factorizations for Heterogeneous Computational Clusters	43
<i>Ravi Reddy Manumachu, Alexey Lastovetsky, Pedro Alonso</i>	
Speculative Computing of Recursive Functions Taking Values from Finite Sets	51
<i>Marcin Brzuszek, Anna Sasak, Marcin Turek</i>	
A Link-failure Resilient Token based Mutual Exclusion Algorithm for Directed Graph Topology.....	59
<i>Sukhendu Kanrar, Sankhyayan Choudhury, Nabendu Chaki</i>	
Heterogeneous PBLAS: Optimization of PBLAS for Heterogeneous Computational Clusters	67
<i>Ravi Reddy Manumachu, Alexey Lastovetsky, Pedro Alonso</i>	
Using a Genetic Algorithm and the Grid to Improve Transport Levels in the TJ-II Stellarator	75
<i>Antonio Gómez-Iglesias, Miguel Á. Vega-Rodríguez, Francisco Castejón-Magaña, Miguel Cárdenas-Montes, Enrique Morales-Ramos</i>	

Parallel Metropolis-Montecarlo Simulation for Potts Model using an Adaptable Network Topology based on Dynamic Graph Partitioning	83
<i>Carlos Castaneda-Marroquín, Carmen B. Navarrete, Alfonso Ortega, Manuel Alfonseca, Eloy Anguiano</i>	

TASK SCHEDULING AND LOAD BALANCING

Task Scheduling for SoC-Based Dynamic SMP Clusters with Communication on the Fly	91
<i>Lukasz Masko, Marek Tudruj</i>	
Designing Load Balancing Algorithms Capable of Dealing with Workload Variability	99
<i>Marta Beltrán, Antonio Guzmán</i>	
A MILP Approach to Schedule Parallel Independent Tasks	107
<i>Alfredo Goldman, Yanik Ngoko</i>	
Investigating a Dynamic Loop Scheduling with Reinforcement Learning Approach to Load Balancing in Scientific Applications	115
<i>Mahbubur Rashid, Ioana Banicescu, Ricolindo L. Carino</i>	
Performance Analysis of Grid DAG Scheduling Algorithms using MONARC Simulation Tool	123
<i>Florin Pop, Ciprian Dobre, Valentin Cristea</i>	
Load Balancing in Mesh-like Computations using Prediction Binary Trees	131
<i>Biagio Cosenza, Gennaro Cordasco, Rosario De Chiara, Ugo Erra, Vittorio Scarano</i>	
Graph Based Evaluation of Satellite Imagery Processing over Grid	139
<i>Victor Bacu, Dorian Gorgan</i>	
Genetic Optimization of Parallel FDTD Computations	147
<i>Adam Smyk, Marek Tudruj</i>	

ALGORITHMS, MODELS AND FORMAL VERIFICATION

A New Parallel Algorithm for the Frequent Itemset Mining Problem	154
<i>Mitica Craus</i>	
Derivation Control Environment as a Tool for an Efficient Distributed Graph Transformations Coordination	160
<i>Leszek Kotulski, Adam Sedzisz</i>	
The Shared Memory Hierarchy: The PRAM is as Powerful as the BSR	168
<i>Stefan D. Bruda, Yuanqiao Zhang</i>	

TOOLS AND ENVIRONMENTS FOR PARALLEL PROGRAMMING

A Runtime System Architecture for Ubiquitous Support of OpenMP	175
<i>Giorgos Ch. Philos, Vassilios V. Dimakopoulos, Panagiotis E. Hadjidoukas</i>	
Using Source-to-Source Transformation Tools to Provide Distributed Parallel Applications from OpenMP Source Code	183
<i>Eric Renault, Charles Ancelin, Willy Jimenez, Oscar Botero</i>	
Initial Experiences with the BEC Parallel Programming Environment	191
<i>Mike Heroux, Zhaofang Wen, Junfeng Wu, Yuesheng Xu</i>	

EMBEDDED SYSTEMS AND ARCHITECTURES

Modeling and Formal Validation of High-Performance Embedded Systems.....	199
<i>Abdoulaye Gamatié, Eric Rutten, Huafeng Yu, Pierre Boulet, Jean-Luc Dekeyser</i>	
FPGA Generators of Combinatorial Configurations in a Linear Array Model.....	207
<i>Zbigniew Kokosinski, Paweł Halesiak</i>	
Bitstreams Repository Hierarchy for FPGA Partially Reconfigurable Systems	212
<i>Pierre Bomel, Jean-Philippe Diguet, Guy Gogniat, Jérémie Crenne</i>	

PARALLEL SCIENTIFIC COMPUTING AND LARGE SCALE SIMULATIONS

An Improved Parallel Algorithm for Computing Approximate Inverses by Reducing Synchronizations	219
<i>George A. Gravvanis, Konstantinos M. Giannoutakis</i>	
Large Scale Parallel Hybrid GMRES Method for the Linear System on Grid System	226
<i>Ye Zhang, Guy Bergere, Serge Petiton</i>	
Computing Equilibria in Bimatrix Games by Parallel Support Enumeration.....	232
<i>Jonathan Widger, Daniel Grosu</i>	

GRID COMPUTING

Towards a Grid Oriented Architecture for Symbolic Computing	239
<i>Georgiana Macariu, Alexandru Carstea, Marc Frincu, Dana Petcu</i>	
Algorithms for Network Topology Discovery using End-to-End Measurements.....	247
<i>Laurent Bobelin, Traian Muntean</i>	
An Architecture for an Adaptive Run-time Prediction System	255
<i>Christian Glasner, Jens Volkert</i>	

NETWORKS AND DATA TRANSFER SCHEDULING

Efficient Data Structures for Online QoS-Constrained Data Transfer Scheduling	263
<i>Mugurel Ionut Andreica, Nicolae Tapus</i>	
Optimized Communication Control in Programs for Dynamic Look-Ahead Reconfigurable SoC Systems.....	271
<i>Eryk Laskowski, Marek Tudruj</i>	
Scheduled Routing in an Optical Hypercube.....	278
<i>Risto T. Honkanen</i>	

NEW PARALLEL CONCEPTS AND ARCHITECTURES

Data Partitioning and Placement Schemes for Matrix Multiplications on a PIM Architecture	284
<i>Jae Chul Cha, Sandeep K. Gupta</i>	
Distributed Web-based Platform for Computer Architecture Simulation	292
<i>Aleksandar Ilic, Frederico Pratas, Leonel Sousa</i>	

Heuristic Optimization Methods for Improving Performance of Recursive General Purpose Applications on GPUs	300
<i>Shinichi Yamagiwa, Koichi Wada, Leonel Sousa</i>	

FAULT TOLERANCE IN PARALLEL AND DISTRIBUTED SYSTEMS

A Highly Available Log Service for Transaction Termination	308
<i>Lasaro Camagos, Marcin Wieloch, Fernando Pedone, Edmundo Madeira</i>	
Fault Tolerant K-Mutual Exclusion Algorithm Using Failure Detector	316
<i>Mathieu Bouillageut, Luciana Arantes, Pierre Sens</i>	
Token Loss Detection for Random Walk based Algorithm.....	324
<i>Thibault Bernard, Alain Bui, Devan Sohier</i>	

MOBILE COMPUTING AND SECURITY

Context Modeling for Urban Mobile Applications.....	330
<i>Romain Williot, Dan Grigoras</i>	
Spontaneous, Self-Sampling Quorum Systems for Ad Hoc Networks.....	338
<i>Kishori M. Konwar, Peter M. Musial, Alexander A. Shvartsman</i>	
Towards Security Hardening of Scientific Demand-Driven and Pipelined Distributed Computing Systems.....	346
<i>Serguei A. Mokhov</i>	

DISTRIBUTED SYSTEMS METHODOLOGY AND NETWORKING

Framework for High-Performance Data Transfers Optimization in Large Distributed Systems.....	354
<i>Catalin Cirstoiu, Ramiro Voicu, Nicolae Tapus</i>	
Design and Implementation of a Service-integrated Session Layer for Efficient Message Passing in Grid Computing Environments	362
<i>Carsten Clauss, Stefan Lankes, Thomas Bemmerl</i>	
InDiGO: An Infrastructure for Optimization of Distributed Algorithms	370
<i>Valeriy Kolesnikov, Gurdip Singh</i>	
A Monitoring Architecture for High-Speed Networks in Large Scale Distributed Collaborations	378
<i>Alexandru Costan, Ciprian Dobre, Valentin Cristea, Ramiro Voicu</i>	

POSTER PAPERS

Global States Monitoring in Execution Control of Parallel Programs.....	386
<i>Janusz Borkowski, Marek Tudruj</i>	
Scalable Distributed Data Structures for Linux-based Multicomputer	391
<i>Arkadiusz Chrobot, Grzegorz Lukawski, Krzysztof Sapiecha</i>	
An Exhaustive Comparison Framework for Distributed Shape Differentiation in a MEMS Sensor Actuator Array	396
<i>Eugen Dedu, Kahina Boutoustous, Julien Bourgeois</i>	

Realistic Simulation of Large Scale Distributed Systems using Monitoring.....	401
<i>Ciprian Dobre, Corina Stratan, Valentin Cristea</i>	
Particle Simulations of Two-Phase Flows on Cell Broadband Engine	406
<i>Jacek Kitowski, Tomasz Rozen, Krzysztof Boryczko, Witold Alda</i>	
FPGA Implementations of a Parallel Associative Processor with Multi-Comparand Multi-Search Operations.....	411
<i>Zbigniew Kokosinski, Bartlomiej Malus</i>	
Randomized Online File Allocation on Uniform Ring Networks.....	416
<i>Akira Matsubayashi, Yasuyuki Kawamura</i>	
Formal Modelling and Verification of Concurrent Systems with XCCS	421
<i>Piotr Matyjasik, Marcin Szpyrka</i>	
UML Statecharts Compositional Semantics in LOTOS	426
<i>Rafal Mrowka, Tomasz Szmuc</i>	
A Threaded Divide and Conquer Symmetric Tridiagonal Eigensolver on Multicore Systems.....	431
<i>Antonio Vidal, Murilo Boratto, Pedro Alonso</i>	

Author Index