

Table of Contents

Keynote Address

Life's Duplicities: Sex, Death, and Valis	1
<i>Bud Mishra</i>	

Session I – Performance Issues and Power-Aware Architectures

Chair: *Rajeev Kumar*

Performance Analysis of Blue Gene/L Using Parallel Discrete Event Simulation	2
<i>Ed Upchurch, Paul L. Springer, Maciej Brodowicz, Sharon Brunett, T.D. Gottschalk</i>	
An Efficient Web Cache Replacement Policy	12
<i>A. Radhika Sarma, R. Govindarajan</i>	
Timing Issues of Operating Mode Switch in High Performance Reconfigurable Architectures	23
<i>Rama Sangireddy, Huesung Kim, Arun K. Somani</i>	
Power-Aware Adaptive Issue Queue and Register File	34
<i>Jaume Abella, Antonio González</i>	
FV-MSB: A Scheme for Reducing Transition Activity on Data Buses	44
<i>Dinesh C. Suresh, Jun Yang, Chuanjun Zhang, Banit Agrawal, Walid Najjar</i>	

Session II – Parallel/Distributed and Network Algorithms

Chair: *Javed I. Khan*

A Parallel Iterative Improvement Stable Matching Algorithm	55
<i>Enyue Lu, S.Q. Zheng</i>	
Self-Stabilizing Distributed Algorithm for Strong Matching in a System Graph	66
<i>Wayne Goddard, Stephen T. Hedetniemi, David P. Jacobs, Pradip K. Srimani</i>	
Parallel Data Cube Construction: Algorithms, Theoretical Analysis, and Experimental Evaluation	74
<i>Ruoming Jin, Ge Yang, Gagan Agrawal</i>	

Efficient Algorithm for Embedding Hypergraphs in a Cycle 85
Qian-Ping Gu, Yong Wang

Mapping Hypercube Computations onto Partitioned Optical Passive
 Star Networks 95
Alessandro Mei, Romeo Rizzi

Keynote Address

The High Performance Microprocessor in the Year 2013:
 What Will It Look Like? What It Won't Look Like? 105
Yale Patt

**Session III – Routing in Wireless, Mobile, and
 Cut-Through Networks**
Chair: Pradip K Srimani

FROOTS – Fault Handling in Up*/Down* Routed Networks with
 Multiple Roots 106
Ingebjørg Theiss, Olav Lysne

Admission Control for DiffServ Based Quality of Service in
 Cut-Through Networks 118
*Sven-Arne Reinemo, Frank Olaf Sem-Jacobsen, Tor Skeie,
 Olav Lysne*

On Shortest Path Routing Schemes for Wireless Ad Hoc Networks 130
Subhankar Dhar, Michael Q. Rieck, Sukesh Pai

A Hierarchical Routing Method for Load-Balancing 142
Sangman Bak

Ring Based Routing Schemes for Load Distribution and Throughput
 Improvement in Multihop Cellular, Ad hoc, and Mesh Networks 152
Gaurav Bhaya, B.S. Manoj, C. Siva Ram Murthy

Session IV – Scientific and Engineering Applications
Chair: Gagan Agrawal

A High Performance Computing System for Medical Imaging in the
 Remote Operating Room 162
*Yasuhiro Kawasaki, Fumihiko Ino, Yasuharu Mizutani,
 Noriyuki Fujimoto, Toshihiko Sasama, Yoshinobu Sato,
 Shinichi Tamura, Kenichi Hagihara*

Parallel Partitioning Techniques for Logic Minimization Using
 Redundancy Identification 174
B. Jayaram, A. Manoj Kumar, V. Kamakoti

Parallel and Distributed Frequent Itemset Mining on Dynamic Datasets	184
<i>Adriano Veloso, Matthew Eric Otey, Srinivasan Parthasarathy, Wagner Meira Jr.</i>	

A Volumetric FFT for BlueGene/L	194
<i>Maria Eleftheriou, José E. Moreira, Blake G. Fitch, Robert S. Germain</i>	

A Nearly Linear-Time General Algorithm for Genome-Wide Bi-allele Haplotype Phasing	204
<i>Will Casey, Bud Mishra</i>	

Keynote Address

Energy Aware Algorithm Design via Probabilistic Computing: From Algorithms and Models to Moore's Law and Novel (Semiconductor) Devices	216
<i>Krishna V. Palem</i>	

Session V – System Support in Overlay Networks, Clusters, and Grid Chair: *Subhankar Dhar*

Designing SANs to Support Low-Fanout Multicasts	217
<i>Rajendra V. Boppana, Rajesh Boppana, Suresh Chalasani</i>	

POMA: Prioritized Overlay Multicast in Ad Hoc Environments	228
<i>Abhishek Patil, Yunhao Liu, Lionel M. Ni, Li Xiao, A.-H. Esfahanian</i>	

Supporting Mobile Multimedia Services with Intermittently Available Grid Resources	238
<i>Yun Huang, Nalini Venkatasubramanian</i>	

Exploiting Non-blocking Remote Memory Access Communication in Scientific Benchmarks	248
<i>Vinod Tipparaju, Manojkumar Krishnan, Jarek Nieplocha, Gopalakrishnan Santhanaraman, Dhabaleswar Panda</i>	

Session VI – Scheduling and Software Algorithms Chair: *Rahul Garg*

Scheduling Directed A-Cyclic Task Graphs on Heterogeneous Processors Using Task Duplication	259
<i>Sanjeev Baskiyar, Christopher Dickinson</i>	

XVIII Table of Contents

Double-Loop Feedback-Based Scheduling Approach for Distributed
Real-Time Systems 268
Suzhen Lin, G. Manimaran

Combined Scheduling of Hard and Soft Real-Time Tasks in
Multiprocessor Systems 279
B. Duwairi, G. Manimaran

An Efficient Algorithm to Compute Delay Set in SPMD Programs 290
Manish P. Kurhekar, Rajkishore Barik, Umesh Kumar

Dynamic Load Balancing for I/O-Intensive Tasks on
Heterogeneous Clusters 300
Xiao Qin, Hong Jiang, Yifeng Zhu, David R. Swanson

Keynote Address

Standards Based High Performance Computing 310
David Scott

Session VII – Network Design and Performance Issues
Chair: Rajendra Boppana

Delay and Jitter Minimization in High Performance Internet
Computing 311
Javed I. Khan, Seung S. Yang

An Efficient Heuristic Search for Optimal Wavelength Requirement
in Static WDM Optical Networks 323
Swarup Mandal, Debashis Saha

Slot Allocation Schemes for Delay Sensitive Traffic Support in
Asynchronous Wireless Mesh Networks 333
V. Vidhyashankar, B.S. Manoj, C. Siva Ram Murthy

Multicriteria Network Design Using Distributed Evolutionary
Algorithm 343
Rajeev Kumar

Session VIII – Grid Applications and Architecture
Support
Chair: Vipin Chaudhary

GridOS: Operating System Services for Grid Architectures 353
Pradeep Padala, Joseph N. Wilson

Hierarchical and Declarative Security for Grid Applications 363
Isabelle Attali, Denis Caromel, Arnaud Contes

A Middleware Substrate for Integrating Services on the Grid	373
<i>Viraj Bhat, Manish Parashar</i>	

Performance Analysis of a Hybrid Overset Multi-block Application on Multiple Architectures	383
<i>M. Jahed Djomehri, Rupak Biswas</i>	

Complexity Analysis of a Cache Controller for Speculative Multithreading Chip Multiprocessors	393
<i>Yoshimitsu Yanagawa, Luong Dinh Hung, Chitaka Iwama, Niko Demus Barli, Shuichi Sakai, Hidehiko Tanaka</i>	

Keynote Address

One Chip, One Server: How Do We Exploit Its Power?	405
<i>Per Stenstrom</i>	

Session IX – Performance Evaluation and Analysis

Chair: *Krishnaiya Thulasiraman*

Data Locality Optimization for Synthesis of Efficient Out-of-Core Algorithms	406
<i>Sandhya Krishnan, Sriram Krishnamoorthy, Gerald Baumgartner, Daniel Cociorva, Chi-Chung Lam, P. Sadayappan, J. Ramanujam, David E. Bernholdt, Venkatesh Choppella</i>	

Performance Evaluation of Working Set Scheme for Location Management in PCS Networks	418
<i>Pravin Amrut Pawar, S.L. Mehndiratta</i>	

Parallel Performance of the Interpolation Supplemented Lattice Boltzmann Method	428
<i>C. Shyam Sunder, G. Baskar, V. Babu, David Strenski</i>	

Crafting Data Structures: A Study of Reference Locality in Refinement-Based Pathfinding	438
<i>Robert Niewiadomski, José Nelson Amaral, Robert C. Holte</i>	

Improving Performance Analysis Using Resource Management Information	449
<i>Tiago C. Ferreto, César A.F. De Rose</i>	

Session X – Scheduling and Migration

Chair: *Baba C. Vemuri*

Optimizing Dynamic Dispatches through Type Invariant Region Analysis	459
<i>Mark Leair, Santosh Pande</i>	

Thread Migration/Checkpointing for Type-Unsafe C Programs	469
<i>Hai Jiang, Vipin Chaudhary</i>	
Web Page Characteristics-Based Scheduling	480
<i>Yianxiao Chen, Shikharesh Majumdar</i>	
Controlling Kernel Scheduling from User Space: An Approach to Enhancing Applications' Reactivity to I/O Events.....	490
<i>Vincent Danjean, Raymond Namyst</i>	
High-Speed Migration by Anticipative Mobility	500
<i>Luk Stoops, Karsten Verelst, Tom Mens, Theo D'Hondt</i>	
Author Index	511