Table of Contents

Keynote Address 1
Stability Issues in Heterogeneous and FIFO Networks under the Adversarial Queueing Model
Paul G. Spirakis

Stability Issues in Heterogeneous and FIFO Networks under the Adversarial Queueing Model 3
D.K. Koukopoulos, S.E. Nikoletseas, Paul G. Spirakis

Session I: Algorithms
Chair: J.L.V. Lewandowski

Mesh Algorithms for Multiplication and Division 17
S. Rao Kosaraju

Compact Routing in Directed Networks with Stretch Factor of Two 24
Punit Chandra, Ajay D. Kshemkalyani

Parametric Scheduling – Algorithms and Complexity 36
K. Subramani

An Efficient Algorithm for Computing Lower Bounds on Time and Processors for Scheduling Precedence Graphs on Multicomputer Systems 47
B.S. Panda, Sajal K. Das

On Job Scheduling for HPC-Clusters and the dynP Scheduler 58
Achim Streit

An Adaptive Scheme for Fault-Tolerant Scheduling of Soft Real-Time Tasks in Multiprocessor Systems 68
R. Al-Omari, Arun K. Somani, G. Manimaran

Keynote Address 79
Learning from the Success of MPI
William D. Gropp

Learning from the Success of MPI 81
William D. Gropp

Session II: Applications
Chair: P.J. Narayanan

Gyrokinetic Simulations of Plasma Turbulence on Massively Parallel Computers 95
J.L.V. Lewandowski, W.W. Lee, Z. Lin

A Parallel Krylov-Type Method for Nonsymmetric Linear Systems 104
Anthony T. Chronopoulos, Andrey B. Kucherov

Evolving Cellular Automata Based Associative Memory for Pattern Recognition 115
Niloy Ganguly, Arijit Das, Pradipta Maji, Biplab K. Sikdar, P. Pal Chaudhuri

Efficient Parallel Algorithms and Software for Compressed Octrees with Applications to Hierarchical Methods 125
Bhanu Hariharan, Srinivas Aluru

A Case Study of Improving Memory Locality in Polygonal Model Simplification: Metrics and Performance 137
Victor Salamon, Paul Lu, Ben Watson, Dima Brodsky, Dave Gomboc

Keynote Address 149
High-Performance Scalable Java Virtual Machines
Vivek Sarkar

High-Performance Scalable Java Virtual Machines 151
Vivek Sarkar, Julian Dolby

Session III: Architecture
Chair: Sriram Vajapeyam

Shared Virtual Memory Clusters with Next-Generation Interconnection Networks and Wide Compute Nodes 167
Courtney R. Gibson, Angelos Bilas

Stream-Packing: Resource Allocation in Web Server Farms with a QoS Guarantee 182
Johara Shahabuddin, Abhay Chrungoo, Vishu Gupta, Sandeep Juneja, Sanjiv Kapoor, Arun Kumar

Weld: A Multithreading Technique towards Latency-Tolerant VLIW Processors 192
Emre Özer, Thomas M. Conte, Saurabh Sharma

Putting Data Value Predictors to Work in Fine-Grain Parallel Processors 204
Aneesh Aggarwal, Manoj Franklin

Confidence Estimation for Branch Prediction Reversal 214
Juan L. Aragón, José González, José M. García, Antonio González

Retargetable Program Profiling Using High Level Processor Models 224
Rajiv Ravindran, Rajat Moona

Session IV: Systems Software
Chair: Guang R. Gao

Towards Automatic Synthesis of High-Performance Codes for Electronic Structure Calculations: Data Locality Optimization 237
D. Cociorva, J. Wilkins, G. Baumgartner, P. Sadayappan, J. Ramanujam, M. Nooijen, D. Bernholdt, R. Harrison

Block Asynchronous I/O: A Flexible Infrastructure for User-Level Filesystems 249
Muthian Sivathanu, Venkateshwaran Venkataramani, Remzi H. Arpaci-Dusseau

TWLinuX: Operating System Support for Optimistic Parallel Discrete Event Simulation 262
Subramania Sharma T., Matthew J. Thazhuthaveetil

Low-Cost Garbage Collection for Causal Message Logging 272
JinHo Ahn, Sun-Gi Min, ChongSun Hwang

Improving the Precise Interrupt Mechanism of Software-Managed TLB Miss Handlers 282
Aamer Jaleel, Bruce Jacob

Hidden Costs in Avoiding False Sharing in Software DSMs 294
K.V. Manjunath, R. Govindarajan

Keynote Address 305
Heterogeneous Computing: Goals, Methods, and Open Problems
Howard Jay Siegel

Heterogeneous Computing: Goals, Methods, and Open Problems 307
Tracy D. Braun, Howard Jay Siegel, Anthony A. Maciejewski

Session V: Communication Networks
Chair: Joseph Bannister

Maximum Achievable Capacity Gain through Traffic Load Balancing in Cellular Radio Networks: A Practical Perspective 321
Swades De, Sajal K. Das

Performance Evaluation of Mobile Agents for E-commerce Applications 331
Rahul Jha, Sridhar Iyer

Performance Evaluation of Real-Time Communication Services on High-Speed LANs under Topology Changes 341
Juan Fernández, José M. García, José Duato

Wavelength Conversion Placement and Wavelength Assignment in WDM Optical Networks 351
Mahesh Sivakumar, Suresh Subramaniam

Identifying Long-Term High-Bandwidth Flows at a Router 361
Smitha, Inkoo Kim, A.L. Narasimha Reddy

Variable Length Packet Switches: Input Queued Fabrics with Finite Buffers, Speedup, and Parallelism 372
D. Manjunath, Biplab Sikdar

Keynote Address 383
Web Mining Is Parallel
Masaru Kitsuregawa

Web Mining Is Parallel 385
Masaru Kitsuregawa, Iko Pramudiono, Katsumi Takahashi, Bowo Prasetyo

Invited Session: Advances and Research Challenges in Networking
Chair: Cauligi S. Raghavendra

An Optical Booster for Internet Routers 399
Joe Bannister, Joe Touch, Purushotham Kamath, Aatash Patel

Intelligent Traffic Engineering of Internets: Towards a Model-Based Approach 414
Anurag Kumar

Performance Analysis of Data Services over GPRS 425
Marco Ajmone Marsan, Marco Gribaudo, Michela Meo, Matteo Sereno

Author Index 437