Table of Contents

12th International Conference on Parallel and Distributed Systems

Message from the General Chair .......................................................... xi
Message from the Program Chair .......................................................... xii
Organizing Committee ........................................................................ xiv
Reviewers ......................................................................................... xviii

Keynote #1
Blue Gene/L, a Massively Parallel Supercomputer: An Applications Point-of-View
Carlos P. Sosa, IBM and Univ. of Minnesota Supercomputing Institute

Session I-A: Heterogeneous Scheduling
Critical Path and Area Based Scheduling of Parallel Task Graphs on Heterogeneous Platforms .......................................................... 3
Tchimou N’takpé and Frédéric Suter
Efficient Compile-Time Task Scheduling for Heterogeneous Distributed Computing Systems ............................................................... 11
Mohammad I. Daoud and Nawwaf Kharma

Session I-B: Stabilization Algorithms
Verification of Orbitally Self-Stabilizing Distributed Algorithms Using Lyapunov Functions and Poincaré Maps ................................................. 23
Abhishek Dhama, Jens Oehlerking, and Oliver Theel
Fast Convergence in Self-Stabilizing Wireless Networks ......................................................... 31
N. Mitton, É. Fleury, I. Guérin Lassous, B. Sericola, and S. Tixeuil
Snap-Stabilizing PIF and Useless Computations ....................................................... 39
Alain Cournier, Stéphane Devismes, and Vincent Villain

Session I-C: Availability and Security
Efficient Updates in Highly Available Distributed Random Access Memory ......................................................... 49
Damian Cieslicki, Stefan Schäckeler, and Thomas Schwarz
iDIBS: An Improved Distributed Backup System .................................................. 58
Faruck Morcos, Thidapat Chantem, Philip Little, Tiago Gasiba, and Douglas Thain
Research on Object-Storage-Based Intrusion Detection ........................................... 68
Youhui Zhang and Dongsheng Wang
Session I-D: MPI & Shared Memory
LMPI: MPI for Heterogeneous Embedded Distributed Systems ................................................................. 79
    Adnan Agbaria, Dong-In Kang, and Karandeep Singh

Scalable Hybrid Designs for Linear Algebra on Reconfigurable Computing Systems ....................................... 87
    Ling Zhuo and Viktor K. Prasanna

A Dynamic Lock Protocol for Scope-Consistency sDSM Systems ................................................................. 96
    Artemis A. Christopoulou and Eleftherios D. Polychronopoulos

Session II-A: Scheduling and Resource Management
Dynamic Resource Management Heuristics for Minimizing Makespan while Maintaining an Acceptable Level of Robustness in an Uncertain Environment ................................................................. 107
    Ashish M. Mehta, Jay Smith, H. J. Siegel, Anthony A. Maciejewski, Arun Jayaseelan, and Bin Ye

Resource Allocation Framework for Distributed Real-Time End-to-End Tasks .................................................... 115
    Chin-Fu Kuo, Chi-Sheng Shih, and Tei-Wei Kuo

The Impact of Information Availability and Workload Characteristics on the Performance of Job Co-allocation in Multi-clusters .................................................................................................................. 123
    William M. Jones, Walter B. Ligon III, and Nishant Shrivastava

Session II-B: Parallel and Distributed Algorithms I
Parallel Leap: Large-Scale Maximal Pattern Mining in a Distributed Environment ................................................................. 135
    Mohammad El-Hajj and Osmar R. Zaïane

Scalable Parallel Implementation of Exact Inference in Bayesian Networks ................................................................. 143
    Vasanth Krishna Namasivayam and Viktor K. Prasanna

A Parallel Independent Component Analysis Algorithm .................................................................................................... 151
    Hongtao Du, Hairong Qi, and Xiaoling Wang

Session II-C: Web Performance
Secure and High-Performance Web Server System for Shared Hosting Service ................................................................. 161
    Daisuke Hara and Yasuichi Nakayama

    Samee Ullah Khan and Ishfaq Ahmad

Experiences with Simulations—A Light and Fast Model for Secure Web Applications ................................................................. 177
    Ramon Nou, Jordi Guitart, David Carrera, and Jordi Torres

Session II-D: Data Dissemination in Sensor Networks
Multicommodity Flow Based Maximum Lifetime Routing in Wireless Sensor Network ................................................................. 187
    Kumar Padmanabh and Rajarshi Roy

On the Effects of Consistency in Data Operations in Wireless Sensor Networks ................................................................. 195
    Kewei Sha and Weisong Shi

Efficient Cache Replacement in Mobile Environment Using Data Profit ................................................................. 203
    Narottam Chand, R.C. Joshi, and Manoj Misra
Session III-A: QoS in Interconnection Networks
Destination-Based HoL Blocking Elimination ................................................................. 213
T. Nachiondo and J. Flich J. Duato

Providing Quality of Service over Advanced Switching ...................................................... 223
Raul Martinez, Francisco Jose Alfaro, and Jose Luis Sanchez

Session III-B: Streaming
OBN: Peering for Finding Suppliers in P2P On-Demand Streaming Systems ...................... 235
Chi-Shiang Liao, Wen-Hung Sun, Chung-Ta King, and Hung-Chang Hsiao

Distributed Coordination for Scalable Multi-source Streaming Model .................................. 243
Satoshi Itaya, Naohiro Hayashibara, Tomoya Enokido, and Makoto Takizawa

Session III-C: Sensor Network Deployment
A Delaunay Triangulation Based Method for Wireless Sensor Network Deployment ................ 253
Chun-Hsien Wu, Kuo-Chuan Lee, and Yeh-Ching Chung

Jie Wu and Shuhui Yang

Panel:
How will we Develop and Program Emerging Robust, Low-Power, Adaptive Multicore Computing Systems?

Panelists:
David Lilja, U. of Minnesota, Panel Moderator
Dennis Abts, Cray, Inc.
Mark Hill, U. of Wisconsin, Madison
Margaret Martonosi, Princeton University
Jose Moreira, IBM
D.K. Panda, Ohio State University

Keynote #2
Mobile Sensor Networks & the Princeton ZebraNet Project: Experiences and Challenges
Margaret Martonosi, Princeton University

Session IV-A: Power-aware Protocols
Energy-Efficient and Fault-tolerant Resolution of Topographic Queries in Networked Sensor Systems ................................................................................................................. 271
Mitali Singh and Viktor K. Prasanna

A Novel Software Framework for Power-Aware Reconfiguration in Distributed Embedded Smart Cameras ..................................................................................................................... 281
Andreas Doblander, Arnold Maier, Bernhard Rinner, and Helmut Schwabach

Session IV-B: Parallel & Distributed Algorithms II
Acceleration of Maximum Likelihood Estimation for Tomosynthesis Mammography ................ 291
Juemin Zhang, Waleed Meleis, David Kaeli, and Tao Wu

A Performance Study of Group Editing Algorithms ................................................................ 300
Du Li and Rui Li
Distributed Algorithms for Building Hamiltonian Cycles in $k$-ary $n$-cubes and Hypercubes
with Faulty Links ................................................................. 308
Iain A. Stewart

Session IV-C: Grids
Policy-Directed Data Movement in Grids ................................................................. 319
Jun Feng, Lingling Cui, Glenn Wasson, and Marty Humphrey

Flexible Resource Reservation Using Slack Time for Service Grid .................................. 327
Chunming Hu, Jinpeng Huai, and Tianyu Wo

A Pre-evaluating Set based Bias-tuned Reputation Evaluation Method for Trust
Establishment in Grid ......................................................................................... 335
Xiangli Qu and Xuejun Yang

Session IV-D: Multiprocessor Scheduling
Memory and Network Bandwidth Aware Scheduling of Multiprogrammed Workloads
on Clusters of SMPs ......................................................................................... 345
Evangelos Koukis and Nectarios Koziris

Accuracy versus Migration Overhead in Real-Time Multiprocessor Reweighting
Algorithms ........................................................................................................ 355
Aaron Block and James H. Anderson

A Dynamic Critical Path Duplication Task Scheduling Algorithm for Distributed
Heterogeneous Computing Systems ........................................................................ 365
Chun-Hsien Liu, Chia Feng Li, Kuan-Chou Lai, and Chao-Chin Wu

Session V-A: Multicore Scheduling
Loop Scheduling with Complete Memory Latency Hiding on Multi-core Architecture ........ 375
Chun Xue, Zili Shao, Meilin Liu, Meikang Qiu, and Edwin H.-M. Sha

Multi-Level On-Chip Memory Hierarchy Design for Embedded Chip Multiprocessors .......... 383
Ozcan Ozturk, Mahmut Kandemir, Mary Jane Irwin, and Suleyman Tosun

SPM Conscious Loop Scheduling for Embedded Chip Multiprocessors ............................ 391
Liping Xue, Mahmut Kandemir, Guangyu Chen, and Talyan Yemliha

Session V-B: P2P Networks I
Reconciliation in the APPA P2P System ........................................................................ 401
Vidal Martins, Reza Akbarinia, Esther Pacitti, and Patrick Valduriez

Load Balancing with Multiple Hash Functions in Peer-to-Peer Networks .......................... 411
Ye Xia, Shigang Chen, and Vivekanand Korgaonkar

XYZ: A Scalable, Partially Centralized Lookup Service for Large-Scale
Peer-to-Peer Systems ....................................................................................... 421
Jianying Zhang and Jie Wu

Session V-C: Switch Design
Hardware Efficient Two Step Iterative Matching Algorithms for VOQ Switches ............... 431
Deng Pan and Yuanyuan Yang
Scalable Low-Cost QoS Support for Single-Chip Switches ................................................................. 439
Alejandro Martinez, Francisco Jose Alfaro,
Jose Luis Sanchez Garcia, and Jose Duato

A Local Coefficient Based Load Sensitive Routing Protocol for Providing QoS ........................................ 447
Anunay Tiwari and Anirudha Sahoo

Session VI-A: Load Balancing
A Distributed Algorithm for Sharing Web Cache Disk Capacity ............................................................. 457
George Alyfantis, Stathes Hadjiefthymiades, Lazaros Merakos, and Panagiotis Kostopoulos

Optimal Placement of Replicas in Data Grid Environments with Locality Assurance ................................. 465
Yi-Fang Lin, Pangfeng Liu, and Jan-Jan Wu

Session VI-B: Parallel Programming Tools
PARSE: A Tool for Parallel Application Run Time Sensitivity Evaluation .................................................. 475
Jeffrey J. Evans and Cynthia S. Hood

Productivity and Performance in Parallel Programming Environments Using a Novel
Virtual Machine Framework ......................................................................................................................... 485
Raja Neogi

Session VI-C (short papers): Communication Networks
Incentive Compatible Cost- and Stability-Based Routing in Ad Hoc Networks ............................................ 495
Mingming Lu, Feng Li, and Jie Wu

SF-RED: A novel server-based AQM to provide inter-server fairness service ............................................. 501
Hsien-Ming Wu, Chin-Chi Wu, and Woei Lin

Fast and Robust TCP Session Lookup by Digest Hashing ........................................................................ 507
Fong Pong

Keynote #3
Emerging Networking Technologies and Protocols for Next Generation Clusters
Dhabaleswar K. Panda, The Ohio State University

Banquet Address
HPC: Been There, Done That?
Craig Stunkel, Deep Computing Software & Applications, IBM T.J. Watson Research Center

Keynote #4
An Overview of Middleware Architectures for Scheduling Grid Applications
Frederic Desprez, INRIA-ENS Lyon, France

Session VII-A: Fault Tolerance
Reachability-Based Fault-Tolerant Routing .................................................................................................. 515
J. M. Montanana, J. Flich, A. Robles, and J. Duato

Software-Based Adaptive and Concurrent Self-Testing in Programmable Network Interfaces .................. 525
Yizheng Zhou, Vijay Lakamraju, Israel Koren, and C.M. Krishna

Design, Analysis and Performance Evaluation of a New Algorithm for Developing
a Fault Tolerant Distributed System ........................................................................................................... 533
Umasankar Malladi
Session VII-B: P2P Networks II
Oriented Overlays for Clustering Client Requests to Data-Centric Network Services ................................................. 545
Congchun He and Vijay Karamcheti

RASTER: A Light-Weight Routing Protocol to Discover Shortest Overlay Routes in Randomized DHT Systems ................................................................................................................................... 553
Chih-Chiang Wang and Khaled Harfoush

Preferential and Strata Based P2P Model: Selfishness to Altruism and Fairness .......................................................... 561
Darshan Purandare and Ratan Guha

Session VII-C: Resource Monitoring
Job Centric Cluster Monitoring .................................................................................................................................................. 571
Roger Curry and Rob Simmonds

The Node Monitoring Component of a Scalable Systems Software Environment .................................................................................................................................................. 579
Sam Miller and Brett Bode

Coloring the Internet: IP Traceback ........................................................................................................................................ 589
M. Muthuprasanna, G. Manimaran, Mansoor Alicherry, and Vijay Kumar

Session VII-D: Ad Hoc and Wireless Networks
Admission Control and Bandwidth Allocation above Packet Level for IEEE 802.16 Wireless MAN .................................................................................................................................................. 599
Haitang Wang, Bing He, and Dharma P. Agrawal

Utilizing Call Admission Control for Deriving Optimal Pricing of Multiple Service Classes in Mobile Wireless Cellular Networks ........................................................................................................................................ 605
Okan Yilmaz and Ing-Ray Chen

Agent-Based Cooperative Anomaly Detection for Wireless Ad hoc Networks ........................................................................................................................................................................... 613
Hongmei Deng, Roger Xu, Jason Li, Frank Zhang, Renato Levy, and Wenke Lee

Author Index .................................................................................................................................................................................. 621