

**11th ISCA International
Conference on Parallel and
Distributed Computing Systems
1998**

**Chicago, Illinois, USA
2-4 September 1998**

Editors:

**O. Bukhres
A.N. Choudhary**

ISBN: 978-1-61839-826-0

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (1998) by the International Society for Computers and Their Applications
All rights reserved. Reproduction in any form without the written consent of ISCA is prohibited.

Original ISBN: 1-880843-25-0 (Out of Print)
Reprint ISBN: 978-1-61839-826-0

Printed by Curran Associates, Inc. (2012)

For permission requests, please contact the International Society for Computers and Their Applications
at the address below.

International Society for Computers and Their Applications
975 Walnut Street, Suite 132
Cary, NC 27511-4216

Phone: (919) 467-5559
Fax: (919) 467-3430

isca@ipass.net

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2634
Email: curran@proceedings.com
Web: www.proceedings.com

INTERNATIONAL SOCIETY FOR COMPUTERS AND THEIR APPLICATIONS

11th International Conference on Parallel and Distributed Computing Systems

September 2–4, 1998
Days Inn Lake Shore Drive, Chicago, Illinois USA

TECHNICAL PAPER INDEX

SESSION 1A: PARALLELISM

1. **HPF Implementation of NPB2.3**
Michael Frumkin, Haoqiang Jin, Jerry Yan (NASA Ames Research Center) 1
2. **A New Paradigm for Building Scalable and Portable Parallel Applications**
Ami Marowka (The Hebrew University of Jerusalem), Michel Bercovier (Pole Universitaire
Leonard de Vinci) 9
3. **How are We Doing? An Efficiency Measure for Shared, Heterogeneous Systems**
R. Chamberlain (Washington University), D. Chace (Southern Illinois University), A. Patel (Washington
University) 15

SESSION 1B: DISTRIBUTED DATABASE SYSTEMS I

1. **Towards Deadlock-Preventing Query Optimization and Parallelization**
Clara Nippel, Bernhard Mitschang (Technische Universität München) 22
2. **Performance of Five Atomic Commit Protocols in Gigabit-Networked Database Systems**
Y. J. Al-Houmaily (Institute of Public Administration), R. Conticello, J. Pike, P. K. Chrysanthis
(University of Pittsburgh) 29
3. **Interoperability in a Distributed Workflow Management Application**
N. Baker, A. Barry, R. McClatchey (University of the West of England Bristol), J-M. Le Goff (CERN) 37

SESSION 2A: PARALLEL ARCHITECTURES

1. **Impact of Computing-in-Memory on the Performance of Processor-and-Memory Hierarchies**
Renato J. O. Figueiredo, Jose A. B. Fortes, Zina Ben Miled (Purdue University), Valerie Taylor (Northwestern
University), Rudolf Eigenmann (Purdue University) 43
2. **Declustering in Multi-Disk Systems: A Hypergraph Based Approach**
Duen-Ren Liu, Mei-Yu Wu (National Chiao Tung University) 51
3. **A Performance Study of Diffusive vs. Remapped Load-Balancing Schemes**
K. Schloegel, G. Karypis, V. Kumar (University of Minnesota), R. Biswas, L. Oliker (NASA Ames
Research Center) 59

SESSION 2B: WORKFLOW MANAGEMENT SYSTEMS

1. **A Rule-Based Organization Modeling System to Support Dynamic Role Resolution in Workflow**
Edward C. Cheng (OCT Research Laboratory) 67
2. **Monitoring Multi-Organizational Processes**
Dimitrios Georgakopoulos, Himanshu Sinha, Karen Huff, Ben Hurwitz (GTE Laboratories Incorporated) 75
3. **External and Internal Support Services in Workflow Management Systems**
Stefan Jablonski, Jens Neeb, Ralf Schamburger, Michael Schlundt (University of Erlangen-Nuremberg) 81

SESSION 3: INTERCONNECTION NETWORKS

1. **A Heavy-Tailed ON/OFF Source Model with Applications to Network Capacity Planning**
P. M. Fiorini and Yiping Ding (BMC Software), Lester Lipsky (University of Connecticut) 87
2. **Communication Reduction Techniques for Multiple Multicasts Based on Hybrid Scheduling**
David R. Surma, Edwin H.-M. Sha, Peter M. Kogge (University of Notre Dame) 93
3. **Multistage Interconnection Network Recursive-Clos (R-Clos): Emulating the Hierarchical Multi-Bus**
Tomohiro Morimura, Keisuke Iwai, Hideharu Amano (Keio University) 99

SESSION 4A: PARALLEL PROCESSING TECHNIQUES I

1. **XTPVM: An Extended Threaded Parallel Virtual Machine**
Tarek Abdel-Radi, Muhammed Mudawwar (The American University in Cairo) 105
2. **Cost Models for Partitioning Parallel Computations in Two Tiered Architectures**
Csaba Andras Moritz, Lars-Erik Thorelli (Royal Institute of Technology), Peter Thanisch, George Chochia (University of Edinburg) 113

SESSION 4B: PARALLEL PROCESSING TECHNIQUES II

1. **A Framework for Analyzing Multiprocessor Scheduling Techniques**
Mohamed Mohy Mahmoud, Ashraf M. Abdelbar, Tarek Radi (American University in Cairo) 121
2. **Loop Scheduling Optimization with Data Prefetching Based on Multi-Dimensional Retiming**
F. Chen, S. Tongsimma and E. H.-M. Sha (University of Notre Dame) 129
3. **Preemptive Scheduling for Distributed Systems**
Donald McLaughlin (Arizona State University), Shantanu Sardesai, Partha Dasgupta (Tandem Computers, Inc.) 135

SESSION 5A: DISTRIBUTED DATABASE SYSTEM II

1. **Information Discovery for Autonomous Database Systems**
A. Zisman, J. Kramer (Imperial College) 141
2. **PPOS: A Parallel and Persistent Object Store**
Changgui Shi, Thomas W. Christopher (Illinois Institute of Technology) 148
3. **File Placement in a Web Cache Server**
Valery Soloviev, Andrew Yahin (North Dakota State University) 155

SESSION 5B: OBJECT ORIENTED DATABASE SYSTEMS

1. **Semantic Mapping of Events**
Fabio Casati (Politecnico di Milano), Weimin Du and Ming-Chien Shan (Hewlett-Packard Laboratories) 163
2. **A Contextualised Object Data Model Based on Semantic Values**
Alex G. Büchner, David A. Bell, John G. Hughes (University of Ulster) 171
3. **Design and Performance Evaluation of A DSVM Based Parallel Hash Join Algorithm for Object Database Systems in NOW Environments**
Guoren Wang, Ge Yu (Northeastern University), Kunihiko Kaneko, Akifumi Makinouchi (Kyushu University) 177

SESSION 6: NETWORKS I

1. **A Scalable Real-time Signal Processor for Object-oriented Data Flow Applications**
Daniel Scherrer, Hans Eberle (Swiss Federal Institute of Technology) 183
2. **Scheduling Parallel Applications in Networks of Mixed Uniprocessor/Multiprocessor Workstations**
Olaf Amdt, Bernd Freisleben (University of Siegen), Thilo Kielmann (Vrije Universiteit), Frank Thilo (University of Siegen) 190
3. **Packets Scheduling with a New Concept of Work Progress Estimation (WPE)**
Mudassir Tufail, Bernard Cousin (INRIA/IRISA) 198

SESSION 7A: PERFORMANCE ANALYSIS

1. **Performance Evaluation of a 100-TeraOps Parallel System**
Anthony T. Chronopoulos, Ying Gong (University of Texas at San Antonio, Wayne State University), H. Grebel, S. G. Ziavras (New Jersey Institute of Technology) 204
2. **A Parallel Mark and Backtrack Algorithm for the Steiner Problem in Graphs**
Lung-Yung Chu, Dong-Guk Shin (The University of Connecticut) 212
3. **Evaluation of Sorting Algorithms on Vector Processors**
Shintaro Meki (Okayama Prefectural University), Yahiko Kambayashi (Kyoto University) 218

SESSION 7B: SIMULATION

1. **Parallel Implementations of a Three-Dimensional PIC Code Plasma Simulation**
A. Abdelmageed Elsadek (Egyptian Air Forces), Saleh Al-Sharaeh (The University of Alabama, Huntsville), Safwat Ebrahim Elnahass (Egyptian Air Forces), Nagendra Singh, B. Earl Wells (The University of Alabama, Huntsville) 224
2. **An Environment for Parallel Multi-Block, Multi-Resolution Reservoir Simulations**
Manish Parashar (Rutgers, The State University of New Jersey), Ivan Yotov (University of Texas at Austin) 230
3. **Performance of Feedback Fusion Algorithms for Point-to-Multipoint ABR Connections in a Heterogeneous Flow**
Mudassir Tufail, Bernard Cousin (INRIA/IRISA Rennes) 236

SESSION 8A: NETWORKS II

1. **Block-Cyclic Redistribution over Heterogeneous Networks**
Prashanth B. Bhat and Viktor K.. Prasanna (University of Southern California), C. S. Raghavendra
(The Aerospace Corporation) 242
2. **Fully Connected Cubic Network: A Highly Recursive Interconnection Network**
Hong Y. Wang and Rocky K. C. Chang (The Hong Kong Polytechnic University) 250
3. **Worst Case Queue Length Estimation in Networks of Multiple Token Bus Segments**
Henrik Schiøler, Niels Nørgaard Nielsen, Jens Dalsgaard Nielsen, and Niels Jørgensen
(Aalborg University) 256

SESSION 8B: ALGORITHMS

1. **A Heuristic Scheduling Algorithm to Order Parallel Processes Competing for the Critical Section in Shared Memory Environment**
Mi-Sook Kim, Reda A. Ammar, and Howard Sholl (University of Connecticut) 263
2. **An Efficient Reconfiguration Algorithm for Degradable VLSI/WSI Arrays**
Chor Ping Low (Nanyang Technological University) 268

SESSION 9: FAULT TOLERANCE

1. **Performance Analysis of Fault-Tolerant Interval Routing**
Peter Kok K. Loh and Wen Jing Hsu (Nanyang Technological University) 274
2. **A Fault Tolerant Parallel Multigrid Algorithm**
Amitabh Mishra (Lucent Technologies) and Prithviraj Banerjee (Northwestern University) 282
3. **Fault Tolerance and Real Time through Duplication-Based Dynamic Load Sharing**
Peter K. Ibach (Humboldt-Universität zu Berlin) 290