ICPP 2009 Program

SESSION

Wednesday September 23, 2009
9:00-9:30  F1

Opening Remarks

SESSION

Wednesday September 23, 2009
9:30-10:30  F1

Keynote I
Prof. Mateo Valero,
UPC Barcelona, Spain
Title: "On the Future Exaflops Supercomputers"

SESSION

Wednesday September 23, 2009
10:30-11:00

Break

SESSION 1A

Wednesday September 23, 2009
11:00-12:30  F1

Architecture I
Session Chair: Eduard Mehofer, University of Vienna, Austria

Using Coherence Information and Decay Techniques to Optimize L2 Cache Leakage in CMPs
Matteo Monchiero¹, Ramon Canal², Antonio González³
¹HP Labs, ²UPC - Barcelona, ³Intel Labs

Fine-grain Parallelism using Multi-core, Cell/BE, and GPU Systems: Accelerating the Phylogenetic Likelihood Function
Frederico Pratas¹, Pedro Trancoso², Alexandros Stamatakis³, Leonel Sousa³
¹INESC-ID/IST TULisbon, Lisboa, Portugal, ²Department of Computer Science, University Cyprus, Nicosia, Cyprus, ³The Exelixis Lab, Ludwig-Maximilians-Universität München, München, Germany

Bank-aware Dynamic Cache Partitioning for Multicore Architectures
Dimitris Kaseridis¹, Jeffrey Stuecheli², Lizy John¹
¹The University of Texas at Austin, ²IBM corp.
SESSION 1B

Wednesday September 23, 2009
11:00-12:30  F8

Grid/Cloud/Cluster I
Session Chair: Junwei Cao, Tsing Hua University, China

Hardware implementation study of the Deficit Table egress link scheduling algorithm
Raúl Martínez1, José M. Claver2, Francisco J. Alfaro3, José L. Sánchez2
1Intel-UPC Barcelona Research Center (Spain), 2University of Valencia (Spain), 3University of Castilla-La Mancha (Spain)

Accelerating Checkpoint Operation by Node-Level Write Aggregation on Multicore Systems
Xiangyong Ouyang, Karthik Gopalakrishnan, Dhabaleswar K. Panda
The Ohio State University

Speeding Up Distributed MapReduce Applications Using Hardware Accelerators
Yolanda Becerra, Vicenç Beltran, David Carrera, Marc González, Jordi Torres, Eduard Ayguadé
Technical University of Catalonia (UPC) / Barcelona Supercomputing Center (BSC)

SESSION 1C

Wednesday September 23, 2009
11:00-12:30  F3

Wireless/Sensor I
Session Chair: Leonard Barolli, Fukuoka Institute of Technology (FIT), Japan

Run to Potential: Sweep Coverage in Wireless Sensor Networks
Min Xi1, Kui Wu1, Yinhao Liu1, Mo Li2
1Hong Kong University of Science and Technology, 2University of Victoria

CED: a community-based event delivery protocol in publish/subscribe systems for delay tolerant sensor network (DTSN)
Jinqi Zhu1, Ming Liu1, Jiannong Cao2, Guihai Chen1, Haigang Gong1, Fulong Xu1
1Dept. of Computer Science and Engineering, University of Electronic Science and Technology of China,
2Internet and Mobile Computing Lab, Department of Computing, Hong Kong Polytechnic University,
State Key Laboratory for Novel Software Technology Nanjing University

End-User Diagnosis of Communication Paths in Sensor Network Systems
Qing Cao, Dong Wang, Tarek Abdelzaher
University of Illinois

SESSION

Wednesday September 23, 2009
12:30-14:00

Lunch

SESSION 2A

Wednesday September 23, 2009
Efficient Scheduling of Nested Parallel Loops on Multi-Core Systems
Arun Kejariwal¹, Alex Nicolau¹, Alex Veidenbaum¹, Utpal Banerjee¹, Constantine Polychronopoulos²
¹UCI, ²UIUC

A Parallel Skeleton Library for Multi-core Clusters
Yuki Karasawa and Hideya Iwasaki
The University of Electro-Communications

Parallel Phase Model: A Programming Model for High-end Parallel Machines with Manycores
Ron Brightwell¹, Mike Heroux¹, Zhaofang Wen¹, Junfeng Wu²
¹Sandia National Labs, ²

SESSION 2B

Wednesday September 23, 2009
14:00-15:30  F8

Algorithms & Applications I
Session Chair: Almadena Chtchelkanova, National Science Foundation, USA

Fast Isosurface Extraction for Medical Volume Dataset on Cell BE
Hai Jin, Bo Li, Ran Zheng, Qin Zhang
Huazhong University of Science and Technology

Constructing Gene Regulatory Networks on Clusters of Cell Processors
Jaroslav Zola, Abhinav Sarje, Srinivas Aluru
Iowa State University

Computing Equilibria in Bimatrix Games by Parallel Vertex Enumeration
Jonathan Widger and Daniel Grosu
Wayne State University

SESSION 2C

Wednesday September 23, 2009
14:00-15:30  F3

Performance Evaluation I
Session Chair: Wilfried Gansterer, University of Vienna, Austria

Barcelona OpenMP Tasks Suite: A Set of Benchmarks Targeting the Exploitation of Task Parallelism in OpenMP
Alejandro Duran¹, Xavier Teruel¹, Roger Ferrer¹, Xavier Martorell², Eduard Ayguadé²
¹Barcelona Supercomputing Center, ²BSC-UPC

Performance Characterization of a Hierarchical MPI Implementation on Large-scale Distributed-memory Platforms
Sadaf Alam, Richard Barrett, Jeffery Kuehn, and Steve Poole
Oak Ridge National Laboratory
Integrated Performance Views in Charm++: Projections Meets TAU
Scott Biersdorff1, Chee Wai Lee2, Allen D. Malony1, Laxmikant V. Kale2
1University of Oregon, 2University of Illinois at Urbana-Champaign

SESSION

Wednesday September 23, 2009
15:30-16:00

Coffee Break

SESSION 3A

Wednesday September 23, 2009
16:00-17:30  F6

Data Center I
Session Chair: Krishna Kant, National Science Foundation/Intel, USA

DORA: A Dynamic File Assignment Strategy with Replication
Jonathan Tjoe, Renata Widjaja, Abraham Lee, Tao Xie
San Diego State University

Designing Efficient FTP Mechanisms for High Performance Data-Transfer over InfiniBand
Ping Lai, Hari Subramoni, Sundeep Narravula, Amith Mamidala, Dhabaleswar K. Panda
osu

Performance Evaluation of Energy-Efficient Parallel I/O Systems with Write Buffer Disks
Xiaojun Ruan1, Adam Manrznare3, Shu Yin1, Ziliang Zong2 and Xiao Qin2
1Auburn University, 2South Dakota School of Mines and Technology

SESSION 3B

Wednesday September 23, 2009
16:00-17:30  F8

Resource Management I
Session Chair: Christine Strauss, University of Vienna, Austria

A Strategy-proof Pricing Scheme for Multiple Resource Type Allocations
Yong Meng Teo and Marian Mihaiescu
National University of Singapore

Broker Selection Strategies in Interoperable Grid Systems
Ivan Rodero1, Francesc Guim2, Julita Corbalan1, Liana Fong1, Seyed Masoud Sadjadi4
Stochastic-Based Robust Dynamic Resource Allocation in a Heterogeneous Computing System

James Smith¹, Edwin Chong², Anthony Maciejewski², H.J. Siegel²
¹DigitalGlobe, ²Colorado State University

SESSION 3C

Wednesday September 23, 2009
16:00-17:30  F3

Algorithms & Applications II
Session Chair: Rinku Gupta, Argonne National Lab, USA

Complexity analysis and performance evaluation of matrix product on multicore architectures
Mathias Jacquelin¹, Loris Marchal², Yves Robert¹
¹ENS-Lyon, ²CNRS/ENS-Lyon

Computing the throughput of replicated workflows on heterogeneous platforms
Anne Benoit¹, Matthieu Gallet¹, Bruno Gaufi², Yves Robert¹
¹LIP / ENS Lyon, ²LIG / INRIA

Analysis of Parallel Algorithms for Energy Conservation in Scalable Multicore Architectures
Vijay Anand Reddy and Gul Agha
University of Illinois at Urbana Champaign

SESSION

Wednesday September 23, 2009
19:30-20:30
Reception

SESSION

Thursday September 24, 2009
9:00-10:00  F1

Keynote II
Professor H. T. Kung
Harvard School of Engineering and Applied Sciences Cambridge, MA, USA
Title: Wireless Computing, Networking and Sensing
SESSION
Thursday September 24, 2009
10:00-10:30
Coffee Break

SESSION 4A
Thursday September 24, 2009
10:30-12:00  F1

Architecture II
Session Chair: Ramon Canal, Universitat Politecnica de Catalunya, Spain

A resource optimized remote-memory-access architecture for low-latency communication
Mondrian Nuessle, Martin Scherer, Ulrich Bruening
University of Heidelberg

DTM: Decoupled Hardware Transactional Memory To Support Unbounded Transaction and Operating System
Shaogang Wang, Weixia Xu, Zhengbin Pang, Dan Wu, Qiang Dou and Xiaodong Yang
NUDT

CIFTS: A Coordinated infrastructure for Fault-Tolerant Systems
Rinku Gupta1, Pete Beckman1, Hoony Park2, Ewing Lusk1, Paul Hargrove3, Al Geiser2, Dhabaleswar K. Panda4, Andrew Lumsdaine5, Jack Dongarra6
1Argonne National Laboratory, 2Oak Ridge National Laboratory, 3Lawrence Berkeley National Laboratory, 4Ohio State University, 5Indiana University, 6University of Tennessee, Knoxville

SESSION 4B
Thursday September 24, 2009
10:30-12:00  F5

Grid/Cloud/Cluster II
Session Chair: Minyi Guo, Shanghai Jiao Tong University, China

Haiying Shen1 and Cheng-Zhong Xu2
1University of Arkansas, 2Wayne State University

Using Standards-based Interfaces to Share Data across Grid Infrastructures
Karolina Sarnowska1, Andrew Grimshaw1, Erwin Laure2
1University of Virginia, 2Royal Institute of Technology
GePSeA: A General-Purpose Software Acceleration Framework for Lightweight Task Offloading
Ajeet Singh¹, Pavan Balaji², Wu-chun Feng¹
¹Virginia Tech, ²Argonne National Laboratory

SESSION 4C
Thursday September 24, 2009
10:30-12:00  F6

Wireless/Sensor II
Session Chair: Tarek Abdelzaher, UIUC, USA

SkipStream: A Clustered Skip Graph Based On-demand Streaming Scheme over Ubiquitous Environments
Qifeng Yu, Tianyin Xu, Baoliu Ye, Sanglu Lu, and Daoxu Chen
Nanjing University

A Distributed Three-hop Routing Protocol to Increase the Capacity of Hybrid Networks
Ze Li and Haiying Shen
University of Arkansas

Performance Limits of Fair-Access in Underwater Sensor Networks
Yang Xiao¹, Miao Peng², John Gibson², Geoffrey G. Xie³, Ding-Zhu Du³
¹University of Alabama, ²Naval Postgraduate School, ³University of Texas at Dallas

SESSION
Thursday September 24, 2009
12:00-14:00

Lunch

SESSION 5A
Thursday September 24, 2009
14:00-15:30  F1

Programming Model II
Session Chair: Beniamino Di Martino, Second University of Naples, Italy

Investigating High Performance RMA Interfaces for the MPI-3 Standard
Vinod Tipparaju¹, William Gropp², Hubert Ritzdorf¹, Rajeev Thakur², Jesper Traeff³
¹Oak Ridge National Laboratory, ²University of Illinois, ³NEC Europe Ltd, ⁴Argonne National Laboratory
Optimizing Communication Scheduling using Dataflow Semantics
Adrian Soviani and Jaswinder Pal Singh
Princeton University

Mapping the FDTD Application to Many-Core Chip Architectures
Daniel Orozco and Guang Gao
University of Delaware

SESSION 5B

Thursday September 24, 2009
14:00-15:30  F5

Resource Management II
Session Chair: Erich Schikuta, University of Vienna, Austria

Slotted Wavelength Scheduling for Bulk Transfers in Research Networks
Zhe Wang, Sanjay Ranka, Ye Xia
University of Florida

Optimizing the Latency of Streaming Applications under Throughput and Reliability Constraints
Anne Benoit¹, Mourad Hakem², Yves Robert¹
¹ENS Lyon, ²Univ. Franche Comté

Improving Resource Availability By Relaxing Network Allocation Constraints on the Blue Gene/P
Narayan Desai, Darius Buntinas, Daniel Buettner, Pavan Balaji, Anthony Chan
Argonne National Laboratory

SESSION 5C

Thursday September 24, 2009
14:00-15:30  F6

Algorithms & Applications III
Session Chair: Gul Agha, UIUC, USA

A Parallel Algorithm for Computing Betweenness Centrality
Guangming Tan, Dengbiao Tu, Ninghui Sun
Institute of Computing Technology, Chinese Academy of Science

Load Balance in the Phylogenetic Likelihood Kernel
Alexandros Stamatakis and Michael Ott
Technical University of Munich
Performance Models for Blocked Sparse Matrix-Vector Multiplication kernels
Vasileios Karakasis, Georgios Goumas, Nectarios Koziris
National Technical University of Athens

SESSION
Thursday September 24, 2009
15:30-16:00
Coffee Break

SESSION 6A
Thursday September 24, 2009
16:00-17:30  F1
Performance Evaluation II
Session Chair: Felix Wolf, Julich Supercomputing Center, Germany

On the Scalability of Parallel Verilog Simulation
sina meraji, Wei Zhang, Carl Tropper
school of computer science, Mckinl University

Exploiting Simulation Slack to Improve Parallel Simulation Speed
Jianwei Chen, Murali Annavaram, Michel Dubois
University of Southern California

Direct N-body Kernels for Multicore Platforms
Nitin Arora, Aashay Shringarpure, Richard W. Vuduc
Georgia Institute of Technology

SESSION 6B
Thursday September 24, 2009
16:00-17:30  F6
Algorithms & Applications IV
Session Chair: Sanjay Ranka, University of Florida, USA

Employing Transactional Memory and Helper Threads to Speedup Dijkstra's Algorithm
Konstantinos Nikas, Nikos Anastopoulos, Georgios Goumas, Nectarios Koziris
National Technical University of Athens
A Partition-Merge based Cache-Conscious Parallel Sorting Algorithm for CMP with Shared Cache
Song Hao¹, Zhihui Du¹, David Bader², Yin Ye¹
¹Tsinghua University, ²Georgia Tech University

Scalability of Time- and Space-Efficient Embedded Runge-Kutta Solvers for Distributed Address Space
Matthias Korch and Thomas Rauber
University of Bayreuth, Department of Computer Science

SESSION 6C
Thursday September 24, 2009
16:00-17:30 F5

P2P I
Haiying Shen, Clemson U, USA

Heterogeneity-Aware Erasure Codes for Peer-to-Peer Storage Systems.
Lluis Pamies-Juarez, Pedro Garcia-Lopez, Marc Sanchez-Artigas
Universitat Rovira i Virgili

SandStone: A DHT Key-Value Storage System with Carrier Grade Performance
Guangyu Shi, Jian Chen, Hao Gong, Lingyuan Fan, Haiqiang Xue, Qingming Lu, and Liang Liang
Huawei Technologies Co., Ltd

Exploring the Cost-Availability Tradeoff in P2P Storage Systems
Zhi Yang, Yafei Dai, Zhen Xiao
Department of Computer Science, Peking University

SESSION
Thursday September 24, 2009
19:00-21:00

Banquet

SESSION
Friday September 25, 2009
9:00-10:00 F1

Keynote III
Prof. Michael Resch, HLRS, Stuttgart, Germany
Title: Simulation Performance through Parallelism - Challenges and Options
SESSION
Friday September 25, 2009
10:00-10:30
Coffee Break

SESSION 7A
Friday September 25, 2009
10:30-12:00 F1

Architecture III
Session Chair: Jeff Stuechli, IBM, ISA

Thread Merging schemes for multithreaded clustered VLIW processors
Manoj Gupta, Fermín Sánchez Josep Llosa,
UPC, Spain

Code Semantic-Aware Runahead Threads
Tanausu Ramirez¹, Alex Pajuelo¹, Oliverio J. Santana², Mateo Valero³
¹UPC, ²ULPGC, ³BSC / UPC

Register Versioning: A Low-Complexity Implementation of Register Renaming in Out-of-Order Microarchitectures
Hui Zeng, Kanad Ghose and Dmitry Ponomarev
State University of New York at Binghamton

SESSION 7B
Friday September 25, 2009
10:30-12:00 F5

Grid/Cloud/Cluster III
Session Chair: James French, National Science Foundation, USA

Cache-Efficient, Intranode Large-Message MPI Communication with MPICH2-Nemesis
Darius Buntinas¹, Brice Goglin², David Goodell¹, Guillaume Mercier², Stéphanie Moreaud²
¹Mathematics and Computer Science Division, Argonne National Laboratory, ²INRIA - LaBRI - Université Bordeaux 1, ³ENSEIRB - LaBRI - Université Bordeaux 1

Using Subfiling to Improve Programming Flexibility and Performance of Parallel Shared-file I/O
Kui Gao¹, Wei-keng Liao¹, Arifa Nisar¹, Alok Choudhary¹, Robert Ross², Robert Latham²
¹Northwestern University, ²Argonne National Laboratory
A Parallel Branch and Bound Algorithm for Workflow QoS Optimization
Kevin Kofler, Irfan Ul Haq, Erich Schikuta
University of Vienna, Austria

SESSION 7C
Friday September 25, 2009
10:30-12:00  F6
P2P II
Session Chair: HJ Siegel, Colorado State U, USA

Mediacoop: Hierarchical Lookup for P2P-VoD Services
Tieying Zhang¹, Jianming Lv², Xueqi Cheng¹
¹Institute of Computing Technology, Chinese Academy of Sciences, ²South China University of Technology

SEIF: Search Enhanced by Intelligent Feedback in Unstructured P2P Networks
Xiaoyu Yang and Yiming Hu
University of Cincinnati

On Maximum Stability with Enhanced Scalability in High-Churn DHT Deployment
Junfeng Xie¹, Zhenhua Li¹, Guihai Chen¹, Jie Wu²
¹State Key Laboratory for Novel Software Technology, Nanjing University, ²Department of Computer Science and Engineering, Florida Atlantic University

SESSION
Friday September 25, 2009
12:00-14:00
Lunch

SESSION
Friday September 25, 2009
14:00-15:30  F1
Panel
Title: Challenges of Power Management
Chair: Krishna Kant, Intel/NSF

SESSION
Friday September 25, 2009
15:30-16:00
Coffee Break

---

SESSION 8A

Friday September 25, 2009
16:00-17:30  F1

Resource Management III
Session Chair: Sabri Pllana, University of Vienna, Austria

Green Multicore-SoC Software-Execution Framework with Timely-Power-Gating Scheme
Masafumi Onouchi¹, Keisuke Toyama¹, Toru Nojiri¹, Makoto Sato¹, Masayoshi Mase¹, Jun Shirako², Mikiko Sato¹, Masashi Takada¹, Masayuki Ito³, Hiroyuki Mizuno¹, Mitaro Namiki³, Keiji Kimura³, Hironori Kasahara²
¹Hitachi Ltd., ²Waseda University, ³Tokyo University of Agriculture and Technology, ⁴Renesas Technology Corporation

A Heuristic for Mapping Virtual Machines and Links in Emulation Testbeds
Rodrigo Calheiros¹, Rajkumar Buyya², César De Rose³
¹Pontifical Catholic University of Rio Grande do Sul/The University of Melbourne, ²The University of Melbourne, ³Pontifical Catholic University of Rio Grande do Sul

LeWI: A Runtime Balancing Algorithm for Nested Parallelism
Marta Garcia, Julita Corbalan, Jesus Labarta
BSC

---

SESSION 8B

Friday September 25, 2009
16:00-17:30  F5

Algorithms & Applications V
Session Chair: Yiming Hu, University of Cincinnati, USA

Scalable Parallel Execution of an Event-based Radio Signal Propagation Model for Cluttered 3D Terrains
Sudip Seal and Kalyan Perumalla
ORNL

Generalizing k-Betweenness Centrality Using Short Paths and a Parallel Multithreaded Implementation
Karl Jiang¹, David Ediger², David Bader³
¹Georgia Insititute of Technology, ²Georgia Institute of Technology

Accelerating Lattice Boltzmann Fluid Flow Simulations Using Graphics Processors
Peter Bailey¹, Joe Myre³, Stuart D. C. Walsh¹, David J. Lilja¹, Martin O. Saar³
SESSION 8C

Friday September 25, 2009
16:00-17:30  F6

Information Retrieval I
Session Chair: Peter Brezany, University of Vienna, Austria

An Efficient Collaborative Filtering Approach Using Smoothing and Fusing
Daqiang Zhang1, Jiannong Cao2, Minyi Guo1, Jingyu Zhou1, Vaskar Raychoudhury2
1Shanghai Jiao Tong University, 2The Hong Kong Polytechnic University

End-to-End Study of Parallel Volume Rendering on the IBM Blue Gene/P
Tom Peterka1, Hongfeng Yu2, Robert Ross1, Kwan-Liu Ma3, Rob Latham1
1Argonne National Laboratory, 2Sandia National Laboratories CA, 3University of California at Davis

Group Operation Assembly Language - A Flexible Way to Express Collective Communication
Torsten Hoefler1, Christian Siebert2, Andrew Lumsdaine1
1Indiana University, 2NEC Laboratories Europe