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 Monchiero[1], *Ramon Canal*[2], *Antonio González*[3]
[1]HP Labs, [2]UPC - Barcelona, [3]Intel Labs

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

Bank-aware Dynamic Cache Partitioning for Multicore Architectures
Dimitris Kaseridis[1], *Jeffrey Stuecheli*[2], *Lizy John*[1]
[1]The University of Texas at Austin, [2]IBM 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 Martínez[1], José M. Claver[2], Francisco J. Alfaro[3], José L. Sánchez[3]
[1]Intel-UPC Barcelona Research Center (Spain), [2]University of Valencia (Spain), [3]University 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 Xi[1], Kui Wu[2], Yunhao Liu[1], Mo Li[1]
[1]Hong Kong University of Science and Technology, [2]University of Victoria

CED: a community-based event delivery protocol in publish/subscribe systems for delay tolerant sensor network (DTSN)
jinqi zhu[1], ming liu[1], jiannong cao[2], guihai chen[3], haigang gong[1], fulong xu[1]
[1]Dept. of Computer Science and Engineering, University of Electronic Science and Technology of China, [2]Internet and Mobile Computing Lab, Department of Computing, Hong Kong Polytechnic University, [3]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

14:00-15:30 F6

Programming Model I
Session Chair: Dhabaleswar Panda, Ohio-State University, USA

Efficient Scheduling of Nested Parallel Loops on Multi-Core Systems

Arun Kejariwal[1], Alex Nicolau[1], Alex Veidenbaum[1], Utpal Banerjee[1], Constantine Polychronopoulos[2]

[1]UCI, [2]UIUC

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 Brightwell[1], Mike Heroux[1], Zhaofang Wen[1], Junfeng Wu[2]

[1]Sandia 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

Jaroslaw 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 Duran[1], Xavier Teruel[1], Roger Ferrer[1], Xavier Martorell[2], Eduard Ayguadé[2]

[1]Barcelona Supercomputing Center, [2]BSC-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 Biersdorff[1], *Chee Wai Lee*[2], *Allen D. Malony*[1], *Laxmikant V. Kale*[2]
[1]University of Oregon, [2]University 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 Tjioe, 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 Ruan[1], *Adam Manrznares*[1], *Shu Yin*[1], *Ziliang Zong*[2] *and Xiao Qin*[2]
[1]Auburn University, [2]South 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 Mihailescu
National University of Singapore

Broker Selection Strategies in Interoperable Grid Systems
Ivan Rodero[1], *Francesc Guim*[2], *Julita Corbalan*[1], *Liana Fong*[3], *Seyed Masoud Sadjadi*[4]

[1]Barcelona Supercomputing Center, [2]Technical University of Catalonia, [3]IBM T.J. Watson Research Center, [4]Florida International University

Stochastic-Based Robust Dynamic Resource Allocation in a Heterogeneous Computing System
James Smith[1], Edwin Chong[2], Anthony Maciejewski[2], H.J. Siegel[2]
[1]DigitalGlobe, [2]Colorado 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 Jacquelin[1], Loris Marchal[2], Yves Robert[1]
[1]ENS-Lyon, [2]CNRS/ENS-Lyon

Computing the throughput of replicated workflows on heterogeneous platforms
Anne Benoit[1], Matthieu Gallet[1], Bruno Gaujal[2], Yves Robert[1]
[1]LIP / ENS Lyon, [2]LIG / INRIA

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

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 Gupta[1], Pete Beckman[1], Hoony Park[2], Ewing Lusk[1], Paul Hargrove[3], Al Geist[2], Dhabaleswar K. Panda[4], Andrew Lumsdaine[5], Jack Dongarra[6]
[1]Argonne National Laboratory, [2]Oak Ridge National Laboratory, [3]Lawrence Berkeley National Laboratory, [4]Ohio State University, [5]Indiana University, [6]University 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

Performance Analysis of DHT Algorithms for Range-Query and Multi-Attribute Resource Discovery in Grids
Haiying Shen[1] and Cheng-Zhong Xu[2]
[1]University of Arkansas, [2]Wayne State University

Using Standards-based Interfaces to Share Data across Grid Infrastructures
Karolina Sarnowska[1], Andrew Grimshaw[1], Erwin Laure[2]
[1]University of Virginia, [2]Royal Institute of Technology

GePSeA: A General-Purpose Software Acceleration Framework for Lightweight Task Offloading
Ajeet Singh[1], *Pavan Balaji*[2], *Wu-chun Feng*[1]
[1]Virginia Tech, [2]Argonne 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 Xiao[1], *Miao Peng*[1], *John Gibson*[2], *Geoffrey G. Xie*[2], *Ding-Zhu Du*[3]
[1]University of Alabama, [2]Naval Postgraduate School, [3]University 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 Tipparaju[1], *William Gropp*[2], *Hubert Ritzdorf*[3], *Rajeev Thakur*[4], *Jesper Traeff*[3]
[1]Oak Ridge National Laboratory, [2]University of Illinois, [3]NEC Europe Ltd, [4]Argonne 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 Benoit[1], Mourad Hakem[2], Yves Robert[1]
[1]ENS Lyon, [2]Univ. 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, Mcgill 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, Nektarios Koziris
National Technical University of Athens

A Partition-Merge based Cache-Conscious Parallel Sorting Algorithm for CMP with Shared Cache
Song Hao[1], Zhihui Du[1], David Bader[2], Yin Ye[1]
[1]Tsinghua University, [2]Georgia 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 Ramirez[1], Alex Pajuelo[1], Oliverio J. Santana[2], Mateo Valero[3]
[1]UPC, [2]ULPGC, [3]BSC / 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 Buntinas[1], Brice Goglin[2], David Goodell[1], Guillaume Mercier[3], Stéphanie Moreaud[2]
[1]Mathematics and Computer Science Division, Argonne National Laboratory, [2]INRIA - LaBRI - Université Bordeaux 1, [3]ENSEIRB - LaBRI - Université Bordeaux 1

Using Subfiling to Improve Programming Flexibility and Performance of Parallel Shared-file I/O
Kui Gao[1], Wei-keng Liao[1], Arifa Nisar[1], Alok Choudhary[1], Robert Ross[2], Robert Latham[2]
[1]Northwestern University, [2]Argonne 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 Zhang[1], Jianming Lv[2], Xueqi Cheng[1]
[1]Institute of Computing Technology,Chinese Academy of Sciences, [2]South 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 Xie[1], Zhenhua Li[1], Guihai Chen[1], Jie Wu[2]
[1]State Key Laboratory for Novel Software Technology, Nanjing University, [2]Department 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 Onouchi[1], Keisuke Toyama[1], Toru Nojiri[1], Makoto Sato[1], Masayoshi Mase[2], Jun Shirako[2], Mikiko Sato[3], Masashi Takada[4], Masayuki Ito[4], Hiroyuki Mizuno[1], Mitaro Namiki[3], Keiji Kimura[2], Hironori Kasahara[2]
[1]Hitachi Ltd., [2]Waseda University, [3]Tokyo University of Agriculture and Technology, [4]Renesas Technology Corporation

A Heuristic for Mapping Virtual Machines and Links in Emulation Testbeds
Rodrigo Calheiros[1], Rajkumar Buyya[2], César De Rose[3]
[1]Pontifical Catholic University of Rio Grande do Sul/The University of Melbourne, [2]The University of Melbourne, [3]Pontifical 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 Jiang[1], David Ediger[2], David Bader[2]
[1]Georgia Insititue of Technology, [2]Georgia Institute of Technology

Accelerating Lattice Boltzmann Fluid Flow Simulations Using Graphics Processors
Peter Bailey[1], Joe Myre[2], Stuart D. C. Walsh[3], David J. Lilja[1], Martin O. Saar[3]

[1]Department of Electrical and Computer Engineering, University of Minnesota, Twin Cities, [2]Department of Computer Science, University of Minnesota, Twin Cities, [3]Department of Geology & Geophysics, University of Minnesota, Twin Cities

---

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 Zhang[1], Jiannong Cao[2], Minyi Guo[1], Jingyu Zhou[1], Vaskar Raychoudhury[2]
[1]Shanghai Jiao Tong University, [2]The Hong Kong Polytechnic University

End-to-End Study of Parallel Volume Rendering on the IBM Blue Gene/P
Tom Peterka[1], Hongfeng Yu[2], Robert Ross[1], Kwan-Liu Ma[3], Rob Latham[1]
[1]Argonne National Laboratory, [2]Sandia National Laboratories CA, [3]University of California at Davis

Group Operation Assembly Language - A Flexible Way to Express Collective Communication
Torsten Hoefler[1], Christian Siebert[2], Andrew Lumsdaine[1]
[1]Indiana University, [2]NEC Laboratories Europe