

2012 IEEE International Symposium on Performance Analysis of Systems & Software

(ISPASS 2012)

**New Brunswick, New Jersey, USA
1-3 April 2012**



**IEEE Catalog Number: CFP12PER-PRT
ISBN: 978-1-4673-1143-4**

Table of Contents

2012 IEEE International Symposium on Performance Analysis of Systems and Software ISPASS 2012

Message from the General Chair	<i>vii</i>
Message from the Program Chair.....	<i>viii</i>
Organization and Program Committees	<i>ix</i>
Reviewers	<i>x</i>

Keynote I

Systems management in the age of cloud?	1
<i>Dr. Mazda Marvasti (VMware)</i>	

Session 1: Best Paper Nominees

Stargazer: Automated Regression-Based GPU Design Space Exploration	2
<i>Wenhai Jia (Princeton University), Kelly A. Shaw (University of Richmond), Margaret Martonosi (Princeton University)</i>	

A Mechanistic Performance Model for Superscalar In-Order Processors.....	14
<i>Maximilien Breughe, Stijn Eyerman, Lieven Eeckhout (Ghent University)</i>	

An LTE Uplink Receiver PHY Benchmark and Subframe-Based Power Management.....	25
<i>Magnus Sjaland (Chalmers Univ. of Technology), Sally A. McKee (Chalmers Univ. of Technology), Peter Brauer (Ericsson AB), David Engdal (Ericsson AB), Andras Vajda (Ericsson AB)</i>	

BigHouse: A simulation infrastructure for data center systems	35
<i>David Meisner, Junjie Wu, Thomas F. Wenisch (University of Michigan)</i>	

Session 2: Tools

A Lightweight Hybrid Hardware/Software Approach for Object-Relative Memory Profiling	46
<i>Licheng chen , Zehan Cui, Yungang Bao, Mingyu Chen, Yongbing Huang, Guangming Tan (Institute of Computing Technology, Chinese Academy of Sciences)</i>	

Lynx: A Dynamic Instrumentation System for Data-Parallel Applications on GPGPU-based Architectures.....	58
<i>Naila Farooqui , Andrew Kerr, Greg Eisenhauer , Karsten Schwan , Sudhakar Yalamanchili (Georgia Institute of Technology)</i>	

An FPGA-based Multi-Core Platform for Testing and Analysis of Architectural Techniques.....	68
<i>Will Simoneau , Resit Sendag (University of Rhode Island)</i>	

Session 3: Characterization and Optimizations for Emerging Architectures

Comparing the Power and Performance of Intel's SCC to State-of-the-Art CPUs and GPUs.....78
*Ehsan Totoni, Babak Behzad, Swapnil Ghike, Josep Torrellas
(University of Illinois at Urbana-Champaign)*

**Characterizing and Evaluating a Key-Value Store Applications on
Heterogeneous CPU-GPU Systems88**
*Taylor H. Hetherington (University of British Columbia),
Timothy G. Rogers (University of British Columbia), Lisa Hsu (AMD), Mike O'Connor (AMD),
Tor M. Aamodt (University of British Columbia)*

Selective Commitment and Selective Margin: Techniques to Minimize Cost in an IaaS Cloud99
*Yu-Ju Hong, Jiachen Xue, Mithuna Thottethodi
(Purdue University)*

Poster Session

Exploiting Temporal Locality in Network Traffic Using Commodity Multi-cores110
*Govind Shenoy (Universitat Politecnica De Catalunya (UPC)),
Jordi Tubella (Universitat Politecnica De Catalunya (UPC)),
Antonio Gonzalez (Intel Research Barcelona and UPC)*

Power and Performance Analysis of Network Traffic Prediction Techniques Architectures112
*Muhammad Faisal Iqbal, Lizy John
(UT Austin)*

A Cycle-Level SIMT-GPU Simulation Framework.....114
*Po-Han Wang, Yu-Jung Cheng, Chien-Wei Lo, Chia-Lin Yang
(National Taiwan University)*

Bandwidth Bandit: Understanding Memory Contention116
*David Eklov, Nikos Nikoleris, David Black-Schaffer, Erik Hagersten
(Uppsala University)*

Performance Modeling and Characterization of Large Last Level Caches118
*Parijat Dube, Michael Tsao, Li Zhang, Alan Bivens
(IBM)*

SLA-Guided Energy Savings for Enterprise Servers.....120
*Vlasia Anagnostopoulou (UC Santa Barbara), Martin Dimirgov (Intel Corporation) ,
Doshi Kshitij (Intel Corporation)*

**Understanding the Communication Characteristics in HBase:
What are the Fundamental Bottlenecks?122**
*Md. Wasi-ur-Rahman (The Ohio State University), Jian Huang (The Ohio State University),
Jithin Jose (The Ohio State University), Xiangyong Ouyang (The Ohio State University),
Hao Wang (The Ohio State University), Nusrat S. Islam (The Ohio State University),
Hari Subramoni (The Ohio State University), Chet Murthy (IBM T.J. Watson Research Center),
Dhabaleswar K. Panda (The Ohio State University)*

Keynote II:

Parallelism, Heterogeneity, Communication: Emerging Challenges for Performance Analysis	124
<i>Prof. Margaret Martonosi (Princeton University)</i>	

Session 4: Performance Analysis of Multi-Threading

Data Sharing in Multi-Threaded Applications and its Impact on Chip Design	125
<i>Anil Krishna (NCSU, IBM), Ahmad Samih (NCSU), Yan Solihin (NCSU)</i>	

Using Utility Prediction Models to Dynamically Choose Program Thread Counts	135
<i>Ryan W. Moore, Bruce R. Childers (University of Pittsburgh)</i>	

Speedup Stacks: Identifying Scaling Bottlenecks in Multi-Threaded Applications	145
<i>Stijn Eyerman, Kristof Du Bois, Lieven Eeckhout (Ghent University)</i>	

Performance Analysis of Thread Mappings with a Holistic View of the Hardware Resources	156
<i>Wei Wang, Tania Dey, Jason Mars, Lingjia Tang, Jack Davidson, Mary Lou Soffa (University of Virginia)</i>	

Session 5: Modeling and Simulation Methodology

A Single-Pass Cache Simulation Methodology for Two-level Unified Caches	168
<i>Wei Zang, Ann Gordon-Ross (University of Florida)</i>	

Fast and Cycle-Accurate Modeling of a Multicore Processor	178
<i>Asif Khan, Muralidaran Vijayaraghavan, Silas Boyd-Wickizer, Arvind (MIT)</i>	

FPGA Modeling of Diverse Superscalar Processors	188
<i>Brandon H. Dwiel, Niket K. Choudhary, Eric Rotenberg (North Carolina State University)</i>	

Session 6: Application Characterization and Acceleration

Evaluating FPGA-acceleration for Real-time Unstructured Search	200
<i>Sai Chalamalasetti (UMass Lowell), Martin Margala (UMass Lowell), Wim Vandervauwheide (University of Glasgow), Mitch Wright (Hewlett Packard), Partha Sarathy Ranganathan (Hewlett Packard Labs)</i>	

Combined Profiling: Practical Collection of Feedback Information for Code Optimization	210
<i>Paul Berube, Jose Nelson Amaral (University of Alberta)</i>	

Architectural Characterization and Similarity Analysis of Sunspider and Google's V8 Javascript Benchmarks Processors	243
<i>Devesh Tiwari, Yan Solihin (North Carolina State University)</i>	