

2010 IEEE International Symposium on Modeling, Analysis and Simulation of Computer and Telecommunication Systems

(MASCOTS 2010)

**Miami Beach, Florida, USA
17 – 19 August 2010**



**IEEE Catalog Number: CFP10010-PRT
ISBN: 978-1-4244-8181-1**

2010 18th Annual IEEE/ACM International Symposium on Modeling, Analysis and Simulation of Computer and Telecommunication Systems

MASCOTS 2010

Table of Contents

Message from the General Chair	x
Message from the Program Chairs	xi
Conference Committees	xii
Reviewers	xiv
Keynote 1	xv
Keynote 2	xvi

Session 1 - Best Paper Award Candidates I

EntomoModel: Understanding and Avoiding Performance Anomaly Manifestations	3
<i>Christopher Stewart, Kai Shen, Arun Iyengar, and Jian Yin</i>	
Exploiting Concurrency to Improve Latency and throughput in a Hybrid Storage System	14
<i>Xiaojian Wu and A.L. Narasimha Reddy</i>	
PAC: Pattern-driven Application Consolidation for Efficient Cloud Computing	24
<i>Zhenhuan Gong and Xiaohui Gu</i>	

Session 2 - Best Paper Award Candidates II

Predicting the Performance of Virtual Machine Migration	37
<i>Sherif Akoush, Ripduman Sohan, Andrew Rice, Andrew W. Moore, and Andy Hopper</i>	
Distributed Routing for Vehicular Ad Hoc Networks: Throughput-Delay Tradeoff	47
<i>Ali Abedi, Majid Ghaderi, and Carey Williamson</i>	

DiffECC: Improving SSD Read Performance Using Differentiated Error Correction Coding Schemes	57
<i>Guanying Wu, Xubin He, Ningde Xie, and Tong Zhang</i>	

Session 3 - Storage I

PUD-LRU: An Erase-Efficient Write Buffer Management Algorithm for Flash Memory SSD	69
<i>Jian Hu, Hong Jiang, Lei Tian, and Lei Xu</i>	
Effect of Replica Placement on the Reliability of Large-Scale Data Storage Systems	79
<i>Vinodh Venkatesan, Ilias Iliadis, Xiao-Yu Hu, Robert Haas, and Christina Fragouli</i>	
Sequential Prefetch Cache Sizing for Maximal Hit Rate	89
<i>Swapnil Bhatia, Elizabeth Varki, and Arif Merchant</i>	

Session 4 - Networks I

RRDtrace: Long-term Raw Network Traffic Recording using Fixed-size Storage	101
<i>Antonis Papadogiannakis, Michalis Polychronakis, and Evangelos P. Markatos</i>	
Profit Allocation in Coalitional VoD Service	111
<i>Noriaki Kamiyama, Ryoichi Kawahara, and Haruhisa Hasegawa</i>	
Fair Allocation of Substrate Resources among Multiple Overlay Networks	121
<i>Mehmet Demirci and Mostafa Ammar</i>	

Session 5 - Distributed Systems I

On Predictability of System Anomalies in Real World	133
<i>Yongmin Tan and Xiaohui Gu</i>	
On the Relevance of Social Information to Opportunistic Forwarding	141
<i>Abderrahmen Mtibaa, Martin May, and Mostafa Ammar</i>	
Autonomic Provisioning with Self-Adaptive Neural Fuzzy Control for End-to-end Delay Guarantee	151
<i>Palden Lama and Xiaobo Zhou</i>	

Session 6 - Wireless Networks

Cluster-Based Correlated Data Gathering in Wireless Sensor Networks	163
<i>Ali Dabirmoghaddam, Majid Ghaderi, and Carey Williamson</i>	
Expanding the Event Horizon in Parallelized Network Simulations	172
<i>Georg Kunz, Olaf Landsiedel, Stefan Götz, Klaus Wehrle, James Gross, and Farshad Naghibi</i>	
Analytical Modelling and Message Delay Performance Evaluation of the IEEE 802.16 MAC Protocol	182
<i>Luis F.M. de Moraes and Danielle Lopes F.G. Vieira</i>	

Session 7 - Parallel and Multicore Systems I

Efficient Discovery of Loop Nests in Execution Traces	193
<i>Qiang Xu, Jaspal Subhlok, and Nathaniel Hammen</i>	
Timing Accurate Functional-Level Hardware Simulation with Pull Model Data Flow	203
<i>George F. Riley and Elizabeth Lynch</i>	

A Simulation Framework for the Analysis of the TLB Behavior in Virtualized Environments	211
<i>Girish Venkatasubramanian, Renato J. Figueiredo, Ramesh Illikkal, and Donald Newell</i>	
Session 8 - Networks II	
A Case for Robust Semi-Experiments	225
<i>Himanshu Gupta, Vinay J. Ribeiro, and Anirban Mahanti</i>	
Performance of Quantized Congestion Notification in TCP Incast Scenarios of Data Centers	235
<i>Prajwal Devkota and A.L. Narasimha Reddy</i>	
Measurement-Based Analysis of Head-of-Line Blocking for SIP over TCP	244
<i>Marco Happenhofer and Peter Reichl</i>	
Session 9 - Cloud Computing	
Decision Model for Cloud Computing under SLA Constraints	257
<i>Artur Andrzejak, Derrick Kondo, and Sangho Yi</i>	
Clasas: A Key-Store for the Cloud	267
<i>S.J. Thomas Schwarz and Darrell D.E. Long</i>	
Profit-Aware Server Allocation for Green Internet Services	277
<i>Michele Mazzucco, Dmytro Dyachuk, and Marios Dikaiakos</i>	
Session 10 - Storage II	
Frequency Based Chunking for Data De-Duplication	287
<i>Guanlin Lu, Yu Jin, and David H.C. Du</i>	
Examining Energy Use in Heterogeneous Archival Storage Systems	297
<i>Ian F. Adams, Ethan L. Miller, and Mark W. Storer</i>	
Modeling the Run-time Behavior of Transactional Memory	307
<i>Zhengyu He and Bo Hong</i>	
Session 11 - Distributed Systems II	
Autonomic Log/Restore for Advanced Optimistic Simulation Systems	319
<i>Roberto Vitali, Alessandro Pellegrini, and Francesco Quaglia</i>	
OnTimeDetect: Dynamic Network Anomaly Notification in perfSONAR Deployments	328
<i>Prasad Calyam, Jialu Pu, Weiping Mandrawa, and Ashok Krishnamurthy</i>	
Content Delivery Using Replicated Digital Fountains	338
<i>Niklas Carlsson and Derek L. Eager</i>	
Session 12 - Parallel and Multicore Systems II	
Barra: A Parallel Functional Simulator for GPGPU	351
<i>Sylvain Collange, Marc Daumas, David Defour, and David Parello</i>	
Automatic Derivation of Performance Prediction Models for Load-balancing Properties Based on Goal-oriented Measurements	361
<i>Michael Hauck, Jens Happe, and Ralf H. Reussner</i>	
CantorSim: Simplifying Acceleration of Micro-architecture Simulations	370
<i>Zhibin Yu, Hai Jin, Jian Chen, and Lizy K. John</i>	

Posters

An Adaptive and Energy-efficient Routing Protocol Based on Machine Learning for Underwater Delay Tolerant Networks	381
<i>Tiansi Hu and Yunsi Fei</i>	
An Analytical Model with Improved Accuracy of IEEE 802.11 Protocol Under Unsaturated Conditions	385
<i>Kumaran Vijayasankar, Azar Taufique, Lakshmi Narasimhan Kannan, Marco Tacca, and Andrea Fumagalli</i>	
aSHIP: Autonomous Generator of Random Internet-like Topologies with Inter-domain Hierarchy	388
<i>Joanna Tomasiak and Marc-Antoine Weisser</i>	
Black-Box Performance Modeling for Solid-State Drives	391
<i>Shan Li and H. Howie Huang</i>	
Composite Pseudo-Associative Cache for Mobile Processors	394
<i>Lakshmi Deepika Bobbala, Javier Salvatierra, and Byeong Kil Lee</i>	
Content Retrieval Delay Driven by Caching Policy and Source Selection	397
<i>Mathias Björkqvist and Lydia Y. Chen</i>	
Design of New Aggregation Techniques for Wireless Sensor Networks	400
<i>David Fotue, Foued Melakessou, Thomas Engel, and Houda Labiod</i>	
Dynamic Load Balancing Multipathing in Data Center Ethernet	403
<i>Yang Yu, Khin Mi Mi Aung, Edmund Kheng Kiat Tong, and Chuan Heng Foh</i>	
Efficient Storage Management for Object-based Flash Memory	407
<i>Yangwook Kang, Jingpei Yang, and Ethan L. Miller</i>	
Efficient Web Requests Scheduling Considering Resources Sharing	410
<i>Simon Duquenooy and Gilles Grimaud</i>	
Element Based Semantics in Multi Formalism Performance Models	413
<i>Mauro Iacono and Marco Gribaudo</i>	
Fountains vs Torrents: The P2P ToroVerde Protocol	417
<i>A. Magonetto, S. Spoto, R. Gaeta, M. Grangetto, and M. Sereno</i>	
Impact of Deployment Point Arrangement on Intrusion Detection in Wireless Sensor Networks	421
<i>Yun Wang and Zhengdong Lun</i>	
Integrated Monitoring and Control for Performance Management of Distributed Enterprise Systems	424
<i>Rajat Mehrotra, Abhishek Dubey, Sherif Abdelwahed, and Asser Tantawi</i>	
A Model-Driven Tool for Telecom Service Development Process	427
<i>Ankit Ahuja, Jacques Simonin, and Rémi Nedelec</i>	
Modeling and Evaluation of Control Flow Vulnerability in the Embedded System	430
<i>Mohammad Abdur Rouf and Soontae Kim</i>	
Multi-level Crypto Disk: Secondary Storage with Flexible Performance Versus Security Trade-offs	434
<i>Shiva Chaitanya, Bhuvan Uргаonkar, and Anand Sivasubramaniam</i>	

New Algorithms for File System Cooperative Caching	437
<i>Eric Anderson, Christopher Hoover, and Xiaozhou Li</i>	
Impediments to Analytical Modeling of Multi-Tiered Web Applications	441
<i>Nilabja Roy, Aniruddha Gokhale, and Larry Dowdy</i>	
On the Universal Generation of Mobility Models	444
<i>Alberto Medina, Gonca Gursun, Prithwish Basu, and Ibrahim Matta</i>	
Performance Analysis of Selected Error Control Protocols in Wireless Multimedia Sensor Networks	447
<i>M. Yousof Naderi, Hamid R. Rabiee, and Mohammad Khansari</i>	
Effective Quality of Service Differentiation for Real-world Storage Systems	451
<i>Rui Zhang, David Chambliss, Prashant Pandey, William Shearman, Juan Ruiz, Yan Xu, and Joseph Hyde</i>	
Reinventing Lock Modeling for Multi-Core Systems	455
<i>Yan Cui, Weiyi Wu, Yingxin Wang, Xufeng Guo, Yu Chen, and Yuanchun Shi</i>	
A Symbolic Reachability Graph and Associated Markov Process for a Class of Dynamic Petri Nets	458
<i>Lorenzo Capra</i>	
Towards Collaborative Research and Education in Computer Architecture with the Archer System	462
<i>Girish Venkatasubramanian, David Isaac Wolinsky, and Renato J. Figueiredo</i>	
Trust Mechanisms for Efficiency Improvement in Collaborative Working Environments	465
<i>Xingyu Zheng, Patrick Maillé, Cam Tu Phan Le, and Stéphane Morucci Swid</i>	
Author Index	468