

31ST

IEEE INTERNATIONAL PERFORMANCE, COMPUTING AND COMMUNICATIONS CONFERENCE

PROGRAM GUIDE



IEEE IPCCC 2012

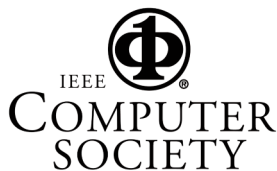
AUSTIN, TEXAS, USA

DECEMBER 1-3, 2012



THE INTERNATIONAL PERFORMANCE, COMPUTING, AND COMMUNICATIONS CONFERENCE IS THE PREMIER IEEE CONFERENCE PRESENTING RESEARCH IN THE PERFORMANCE OF COMPUTER AND COMMUNICATION SYSTEMS.

FOR MORE THAN THREE DECADES, IPCCC HAS BEEN A RESEARCH FORUM FOR ACADEMIC, INDUSTRIAL AND GOVERNMENT RESEARCHERS.





MESSAGE FROM THE IPCCC 2012 GENERAL CO-CHAIRS

It is our great pleasure to welcome you to the 2012 IEEE International Performance, Computing, and Communications Conference (IPCCC 2012). For more than thirty years, IPCCC has been a major forum for students and professionals from academia, industry and government to exchange exciting research results in performance, computers, and communications. This year's program continues our tradition. It consists of two interesting and informative keynote talks, a main conference with two parallel tracks and a poster session.

The conference wouldn't exist without the full support from the Organizing Committee, the careful paper reviews provided by the Technical Program Committee members and external referees. We thank the TPC Co-Chairs Song Fu and Xiao Qin for their hard work in the selection of papers for the conference this year. We also would like to thank all the authors who have supported and contributed to IPCCC with their submissions. Finally, we are grateful to the IEEE Computer Society for its continuing sponsorship of this forum.

On behalf of the conference committee, we extend you our warm welcome to the event in Austin, Texas! We hope you will enjoy the conference as well as the city.

CHENGKAI LI AND YOUTAO ZHANG
GENERAL CO-CHAIRS, IPCCC 2012

MESSAGE FROM THE TECHNICAL PROGRAM CHAIRS

Welcome to the 31st IEEE International Performance, Computing and Communications Conference (IPCCC 2012). On behalf of the technical program committee, we would like to thank all the authors for the high quality papers that are accepted by the IPCCC main conference.

This year, IPCCC 2012 received 115 paper submissions, out of which 32 were selected for publication as regular papers with an acceptance rate of 27.8%. Another 17 submissions were selected for publication as short papers. Most of submissions received three or more peer reviews from our technical program committee and external reviewers. We were only able to accept papers that received broad support from the reviewers. The final technical program includes two keynotes, 16 technical sessions and one poster session.

We would like to thank our program committee members as well as external reviewers, consisting of high visibility

researchers, whose dedication and hard work made the selection of papers for the proceedings possible.

We wish to thank all who contributed to the quality and success of IPCCC 2012. We particularly appreciate the guidance and support from General Chairs Prof. Chengkai Li and Prof. Youtao Zhang. We also thank Publications Chair Prof. Zhiqiang Lin, Publicity Chair Prof. Mea Wang, Web Chair Neil Nelson, Financial Chair Nasr Ullah, Registration Chair Jack Chen, and Poster Chair Prof. Jia Rao.

We once again welcome you all to IPCCC 2012. We hope you enjoy the technical program and have a great time in Austin.

SONG FU AND XIAO QIN,
TECHNICAL PROGRAM CHAIRS,
IEEE IPCCC 2012

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2012 IPCC SCHEDULE DAY ONE - SATURDAY, DECEMBER 1, 2012

REGISTRATION (8:30 A.M.) & WELCOME MESSAGE: (9 - 9:10 A.M.)

KEYNOTE ADDRESS I (SABINE): 9:10 - 10:10 A.M.

A DOUBLE-EDGED SWORD: IMPLICATIONS OF CROWDSOURCING FOR THE FUTURE OF WEB SECURITY,

PROFESSOR BEN ZHAO, UNIVERSITY OF CALIFORNIA, SANTA BARBARA

CHAIR: CHENGKAI LI, UNIVERSITY OF TEXAS AT ARLINGTON

BREAK – 10:10 - 10:30 A.M.

SESSION 1A (SABINE) / 1B (PECOS): 10:30 A.M. - 12 P.M.

SESSION 1A: PERFORMANCE EVALUATION

Chair: Masoud Jalilzadehpolsangi, Sr. (Azad University & Karadeniz Company, Turkey)

10:30 a.m. - Improving Performance and Anonymity in the Tor Network

Andriy Panchenko (University of Luxembourg, Luxembourg); Fabian Lanze (University of Luxembourg, Luxembourg); Thomas Engel (University of Luxembourg, Luxembourg)

11:00 a.m. - Temporal Characterization of SPEC CPU2006 Workloads: Analysis and Synthesis

Qiang Zou (Southwest University, P.R. China); Jianhui Yue (University of Maine, USA); Bruce Segee (University of Maine, USA); Yifeng Zhu (University of Maine, USA)

11:30 a.m. - Performance-Sensitivity and Performance-Similarity Based Workload Reduction

Jie Luo (The University of Texas at San Antonio, USA); Kathlene Morales (The University of Texas at San Antonio, USA); Byeong Lee (The University of Texas at San Antonio, USA); Eugene John (The University of Texas at San Antonio, USA); Young Kyu Choi (Korea University of Technology and Education, KOREA)

SESSION 1B: THERMAL AND POWER MANAGEMENT

Chair: Sanjay Madria (Missouri University of Science and Technology, USA)

10:30 a.m. - Thermal Modeling and Analysis of Storage Systems

Xunfei Jiang (Auburn University, USA); Ji Zhang (Auburn University, USA); Mohammed Ibrahim Alghamdi (Al-Baha University, Saudi Arabia); Maen Al Assaf (Auburn University, USA); Xiaojun Ruan (West Chester University of Pennsylvania, USA); Tausif Muzaffar (Auburn University, USA); Xiao Qin (Auburn University, USA)

11:00 a.m. - Improving the Schedulability and Energy Efficiency for Weakly Hard Real-Time Embedded Systems

Linwei Niu (California State University Bakersfield, USA); Jia Xu (York University, USA)

11:30 a.m. - An Adaptive Power Management Framework for Autonomic Resource Configuration in Cloud Computing Infrastructures

Ziming Zhang (University of North Texas, USA); Qiang Guan (University of North Texas, USA); Song Fu (University of North Texas, USA)

LUNCH (SAN MARCOS): NOON - 1:30 P.M.

SESSION 2A (SABINE) / 2B (PECOS): 1:30 - 3 P.M.

SESSION 2A: CLOUD AND CLUSTER COMPUTING

Chair: Guangping Xu (Tianjin University of Technology, P.R. China)

1:30 p.m. - CloudCast: Cloud Computing for Short-term Mobile Weather Forecasts

Dilip Kumar Krishnappa (University of Massachusetts Amherst, USA); David Irwin (University of Massachusetts, Amherst, USA); Eric Lyons (University of Massachusetts Amherst, USA); Michael Zink (University of Massachusetts Amherst, USA)

2:00 p.m. - AFD: Adaptive Failure Detection System for Cloud Computing Infrastructures

Husanbir S Pannu (University of North Texas, USA); Jianguo Liu (University of North Texas, USA); Qiang Guan (University of North Texas, USA); Song Fu (University of North Texas, USA)

2:30 p.m. - ORCA: An Offloading Framework for I/O-Intensive Applications on Clusters

Ji Zhang (Auburn University, USA); Mohammed Ibrahim Alghamdi (Al-Baha University, Saudi Arabia); Xunfei Jiang (Auburn University, USA); Maen Al Assaf (Auburn University, USA); Yun Tian (Auburn University, USA); Xiao Qin (Auburn University, USA)

SESSION 2B: SENSOR NETWORKS

Chair: Jiang Zheng (Microsoft, USA)

1:30 p.m. - MODESA: an Optimized Multichannel Slot Assignment for Raw Data Convergecast in Wireless Sensor Networks

Ridha Soua (INRIA, France); Pascale Minet (INRIA, France); Erwan Livolant (INRIA, France)

2:00 p.m. - An Arbitrary Mobility Model of Mini-Sinks using Controlled Data Collection for Reducing Congestion Appearance in Wireless Sensor Networks

David Fotue (University of Luxembourg, Luxembourg); Houda Labiod (TELECOM ParisTech (ex: ENST), France); Thomas Engel (University of Luxembourg, Luxembourg)

2:30 p.m. - Fast Sink Placement for Gossip-based Wireless Sensor Networks

Milos Blagojevic (Eindhoven University of Technology, The Netherlands); Marc Geilen (Eindhoven University of Technology, The Netherlands); Twan Basten (Eindhoven University of Technology, The Netherlands); Teun Hendriks (Embedded Systems Institute & Teatownlake, The Netherlands)

BREAK: 3 - 3:30 P.M.

SESSION 3A (SABINE) / 3B (PECOS): 3:30 - 5 P.M.

SESSION 3A: PARALLEL COMPUTING

Chair: Xiaojun Ruan (West Chester University, USA)

3:30 p.m. - A Desktop Grid Enabled Parallel Barnes-Hut Algorithm

Hannes Hannak (University of Stuttgart, Germany); Wolfgang Blochinger (University of Stuttgart, Germany); Sven Triefinger (University of Stuttgart, Germany)

4:00 p.m. - Improved Deduplication through Parallel Binning

Zhike Zhang (University of California, USA); Deepavali Bhagwat (University of California, Santa Cruz, USA); Witold Litwin (Universite Paris, Dauphine, France); Darrell Long (University of California, Santa Cruz, USA); Thomas J.E. Schwarz (Universidad Catolica del Uruguay, Uruguay)

4:30 p.m. - CAST: An Page-Level FTL with Compact Address Mapping and Parallel Data Blocks

Zhiyong Xu (Suffolk University, USA)

SESSION 3B: COMPUTER SECURITY

Chair: Xunfei Jiang (Auburn University, USA)

3:30 p.m. - A System Analysis of Reputation-Based Defenses Against Pollution Attacks in P2P Streaming

Md. Tauhiduzzaman (University of Calgary, Canada); Mea Wang (University of Calgary, Canada)

4:00 p.m. - HAS: Hidden Anti-Theft System Based on Wireless Sensor Networks

Longjiang Guo (Heilongjiang University, P.R. China); Jinsheng Duan (Heilongjiang University, P.R. China); Jinbao Li (Heilongjiang University, P.R. China); Lei Yu (Clemson University, USA)

4:30 p.m. - HADEGA: A Novel MPLS-based Mitigation Solution to Handle Network Attacks

Nabil Hachem (Telecom SudParis, France); Herve Debar (Télécom SudParis & Institut Télécom, France); Joaquin Garcia-Alfaro (Telecom Bretagne, France)

RECEPTION AND POSTER SESSION (SAN ANTONIO): 5 - 6:30 P.M.

FOR MORE INFORMATION ON POSTER SESSION PAPERS AND AUTHORS, SEE PAGE 6

2012 IPCC SCHEDULE DAY TWO - SUNDAY, DECEMBER 2, 2012

REGISTRATION: 8:30 A.M.

KEYNOTE ADDRESS II (SABINE): 9 - 10 A.M.

ON SCALABLE RESILIENCY IN EXASCALE COMPUTING ENVIRONMENTS, PROFESSOR TAIEB ZNATI, UNIVERSITY OF PITTSBURGH
CHAIR: SONG FU, UNIVERSITY OF NORTH TEXAS

BREAK - 10 - 10:30 A.M.

SESSION 4A (SABINE) / 4B (PECOS): 10:30 A.M. - NOON

SESSION 4A: MOBILE AND WIRELESS NETWORKS

Chair: Mea Wang (University of Calgary, Canada)

10:30 a.m. - Firefly-Inspired Synchronization for Energy-Efficient Distance Estimation in Mobile Ad-hoc Networks

Sabrina Merkel (Karlsruhe Institute of Technology & Institute of Applied Informatics and Formal Description Methods, Germany); Christian Becker and Hartmut Schmeck (Karlsruhe Institute of Technology, Germany)

11:00 a.m. - A Wireless System for Reducing Response Time in Urban Search & Rescue

Harsha Chenji (Texas A&M University, USA); Wei Zhang (Texas A&M University, USA); Myounggyu Won (Texas A&M University, USA); Radu Stoleru (Texas A&M University, USA); Clint Arnett (Texas Engineering Extension Services, USA)

11:30 a.m. - CAIRN: Creating Anchors for Localization in Realistic Networks

Kerri A Stone and Tracy Camp (Colorado School of Mines, USA)

SESSION 4B: DISTRIBUTED SYSTEMS

Chair: Michelle Mengxia Zhu (Southern Illinois University Carbondale, USA)

10:30 a.m. - Graph Theoretic Expansion of Borel Cayley Graphs with an Optimal and Distributed Routing Algorithm

Dongsoo Kim (Stony Brook University, USA); Eric Noel (AT&T Labs - Research, USA); Wendy Tang (Stony Brook University, USA)

11:00 a.m. - HERO: Heterogeneity-aware Erasure Coded Redundancy Optimal Allocation for Reliable Storage in Distributed Networks

Guangping Xu (Tianjin University of Technology, P.R. China); Gang Wang (Xiaoguang Liu, Nankai University, China); Kai Shi, Hua Zhang (Tianjin University of Technology, China)

11:30 a.m. - A Cost-Effective Scheduling Algorithm for Scientific Workflows in Clouds

Michelle Mengxia Zhu (Southern Illinois University Carbondale, USA); Qishi Wu (University of Memphis & Oak Ridge National Laboratory, USA); Yang Zhao (Southern Illinois University Carbondale, USA)

LUNCH (SAN MARCOS): NOON - 1:30 P.M.

SESSION 5A (SABINE) / 5B (PECOS): 1:30 - 3 P.M.

SESSION 5A: RESOURCE MANAGEMENT

Chair: Ziliang Zong (Texas State University-San Marcos, USA)

1:30 p.m. - Improving Write Performance by Enhancing Internal Parallelism of Solid State Drives

Xiaojun Ruan (West Chester University of Pennsylvania, USA); Mohammed Ibrahim Alghamdi (Al-Baha University, Saudi Arabia); Ziliang Zong (Texas State University-San Marcos, USA); Yun Tian (Auburn University, USA); Xunfei Jiang (Auburn University, USA); Xiao Qin (Auburn University, USA)

2:00 p.m. - Management of Distributed Resource Allocations in Multi-cluster Environments

Ewnetu Bayuh Lakew (Umeå University, Sweden); Francisco Hernandez-Rodriguez (Umeå University, Sweden); Lei Xu (Umeå University, Sweden); Erik Elmroth (Umeå University, Sweden)

2:30 p.m. - A Genetic Algorithm based Approach to Maximizing Accrued System Value under Resource Constraints

Li Wang (Illinois Institute of Technology, USA); Zheng Li (Illinois Institute of Technology, USA); Miao Song (Illinois Institute of Technology, USA); Shangping Ren (Illinois Institute of Technology, USA)

SESSION 5B: THEORY AND MODELING

Chair: Kirill Kogan (University of Waterloo, Canada)

1:30 p.m. - A Taxonomy of Semi-FIFO Policies

Kirill Kogan (University of Waterloo, Canada); Alejandro López-Ortiz (University of Waterloo, Canada); Sergey Nikolenko (St. Petersburg Academic University, Russia); Alexander Sirotkin (Saint-Petersburg Academic University, Russia)

2:00 p.m. - Evolution of Disconnected Components in Social Networks: Patterns and a Generative Model

Jianwei Niu (Beihang University, P.R. China); Jing Peng (Beihang University, P.R. China); Chao Tong (Beihang University, P.R. China); Wanjiun Liao (National Taiwan University, Taiwan)

2:30 p.m. - Effect of MRAI Timers and Routing Policies on BGP Convergence Time

Rajvir Gill (Simon Fraser University, Canada); Ravinder Paul (Simon Fraser University, Canada); Ljiljana Trajković (Simon Fraser University, Canada)

BREAK: 3 - 3:30 P.M.

SESSION 6A (SABINE) / 6B (PECOS): 3:30 - 5 P.M.

SESSION 6A: GPU

Chair: Ewnetu Bayuh Lakew (Umeå University, Sweden)

3:30 p.m. - Highly Reliable Two-Dimensional RAID Arrays for Archival Storage

Jehan-Francois Pâris (University of Houston, USA); Thomas J.E. Schwarz (Universidad Católica del Uruguay, Uruguay); Ahmed Amer (Santa Clara University, USA); Darrell Long (University of California at Santa Cruz, USA)

4:00 p.m. - Computing Nash Equilibria in Bimatrix Games: GPU-based Parallel Support Enumeration

Safraz Rampersaud (Wayne State University, USA); Lena Mashayekhy (Wayne State University, USA); Daniel Grosu (Wayne State University, USA)

4:30 p.m. - An Efficient Dynamic Multiple-Candidate Motion Vector Approach for GPU-based Hierarchical Motion Estimation

Dung Vu (University of California Riverside, USA); Yang Yang (University of California, Riverside, USA); Laxmi Bhuyan (University of California, USA)

SESSION 6B: DISTRIBUTED COMPUTING (SHORT PAPERS)

Chair: Linwei Niu (California State University Bakersfield, USA)

3:30 p.m. - Incentive Based Approach to Find Selfish Nodes in Mobile P2P Networks

Hemant Meka and Sanjay Madria (Missouri University of Science and Technology, USA); Mark H Linderman (Air Force Research Laboratory, Information Directorate, USA)

3:50 p.m. - Bandwidth-Aware Peer Selection for P2P Live Streaming Systems Under Flash Crowds

Haibo Wu (Institute of Computing Technology, Chinese Academy of Sciences, P.R. China); Jing Liu (Inner Mongolia University, P.R. China); Hai Jiang (Institute of Computing Technology, Chinese Academy of Sciences, P.R. China); Yi Sun (Institute of Computing Technology, Chinese Academy of Sciences, P.R. China); Jun Li (Institute of Computing Technology, Chinese Academy of Sciences, P.R. China); Zhongcheng Li (Institute of Computing Technology, Chinese Academy of Sciences, P.R. China)

4:10 p.m. - Global Workload Characterization of A Large Scale Satellite Image Distribution System

Brian Romoser (Texas State University, USA); Ribel Fares (Texas State University, USA); Peter Janovics (Texas State University, USA); Xiaojun Ruan (West Chester University, USA); Xiao Qin (Auburn University, USA); Ziliang Zong (Texas State University-San Marcos, USA)

4:30 p.m. - Devising Secure Sockets Layer-Based Distributed Systems: A Performance-Aware Approach

Norman Lim (Carleton University, Canada); Shikharesh Majumdar (Carleton University, Canada); Vineet Srivastava (Cistech Limited, Canada)

2012 IPCCC SCHEDULE, DAY THREE - MONDAY, DECEMBER 3, 2012

REGISTRATION: 8:30 A.M.

SESSION 7A (SABINE) / 7B (PECOS): 9 - 10 A.M.

SESSION 7A: INFORMATION ASSURANCE (SHORT PAPERS)

Chair: Thomas J.E. Schwarz (Universidad Catolica del Uruguay, Uruguay)

9:00 a.m. - LBSs Privacy Preserving for Continuous Query based on Semi-honest Third Parties

Yong Wang (University of Electronic and Science Technology of China, P.R. China); Jing Peng (University of Electronic and Science Technology of China, P.R. China); Longping He (University of Electronic and Science Technology of China, P.R. China)

9:20 a.m. - GeoCAPTCHA - A Novel Personalized CAPTCHA Using Geographic Concept to Defend Against 3rd Party Human Attack*

Te-En Wei (National Taiwan University of Science and Technology, Taiwan)

9:40 a.m. - Locating Jamming Attackers in Malicious Wireless Sensor Networks

Kaiqi Xiong (Rochester Institute of Technology, USA)

SESSION 7B: PERFORMANCE ANALYSIS (SHORT PAPERS)

Chair: Guangping Xu (Tianjin University of Technology, P.R. China)

9:00 a.m. - Parallelized Benchmark-Driven Performance Evaluation of SMPs and Tiled Multi-Core Architectures for Embedded Systems

Arslan Munir (Rice University, USA); Ann Gordon-Ross (University of Florida, USA); Sanjay Ranka (University of Florida, USA)

9:20 a.m. - Secure Multipath Routing for AMI Network in Smart Grid

Binod Vaidya (University of Ottawa, Canada); Dimitrios Makrakis (University of Ottawa, Canada); Hussein T Mouftah (University of Ottawa, Canada)

9:40 a.m. - Performance Impact of Virtual Machine Placement in a Data Center

Indrani Paul (Georgia Institute of Technology & Advanced Micro Devices Inc., USA); Sudakhar Yalamanchili (Georgia Institute of Technology, USA); Lizy John (The University of Texas at Austin, USA)

BREAK - 10 - 10:30 A.M.

SESSION 8A (SABINE) / 8B (PECOS): 10:30 A.M. - 11:30 P.M.

SESSION 8A: NETWORK MANAGEMENT (SHORT PAPERS)

Chair: Michael Zink (University of Massachusetts Amherst, USA)

10:30 a.m. - Structured Message Transport

Shayan Pooya (University of Alberta, Canada); Paul Lu (University of Alberta, Canada); Mike MacGregor (University of Alberta, Canada)

10:50 a.m. - PhoneCon: Voice-driven Smartphone Controllable Wireless Sensor Networks

Yanjuan Yao (University of Tennessee, Knoxville, USA); Lipeng Wan (University of Tennessee, USA); Qing Cao (University of Tennessee, USA); Rukun Mao (University of Tennessee Knoxville, USA)

11:10 Towards Network Convergence and Traffic Engineering Optimization

Dan Zhao (National University of Defense Technology, P.R. China); Hong-jun Liu (National University of Defense Technology, P.R. China); Xiaofeng Hu (National University of Defense Technology, P.R. China); Chunqing Wu (National University of Defense Technology, P.R. China)

SESSION 8B: NETWORKS (SHORT PAPERS)

Chair: Mohammed Ibrahim Alghamdi (Al-Baha University, Saudi Arabia)

10:30 a.m. - Channel Impulse Noise Minimization using Digital Smear and Desmear Filter

Grace Oletu (The University of Greenwich, United Kingdom)

10:50 a.m. - A Path-Transfer Based Multi-Path Reliable Routing in Wireless Sensor Networks

Jinbao Li (Heilongjiang University, P.R. China); Li Zhang (Heilongjiang University, P.R. China); Liang Yao (Heilongjiang University, P.R. China)

11:10 a.m. - Quality-of-Information Modeling and Adapting for Delay-Sensitive Sensor Network Applications

Mini Mathew (Southern Illinois University Carbondale, USA); Ning Weng (Southern Illinois University at Carbondale, USA); Lucas Vespa (Southern Illinois University, USA)

END OF 2012 IPCCC PROGRAM SCHEDULE

RECEPTION AND POSTER SESSION INFORMATION FROM DAY ONE, SATURDAY, DECEMBER 1: 5 - 6:30 P.M.

SEE PAGE 4 FOR DAY ONE SCHEDULE

A Workflow-based Network Advisor for Data Movement with End-to-end Performance Optimization

Patrick Brown and Mengxia Zhu (Southern Illinois University, Carbondale, USA); Qishi Wu and Daqing Yun (University of Memphis, USA); Jason Zurawski (Internet2, USA)

PHY and MAC Layer Design of Hybrid Spread Spectrum Based Smart Meter Network

Shravan Garlapati (Virginia Polytechnic and State University, USA); Haris I. Volos (University of Arizona, USA); Phani Teja Kuruganti (Oak Ridge National Laboratory, USA); Michael Buehrer and Jeffrey Reed (Virginia Tech, USA)

Complex Networks Clustering Algorithm Based on the Core Influence of the Nodes

Chao Tong, Jianwei Niu, Bin Dai, Jing Peng and Jinyang Fan (Beihang University, P.R. China)

Static Micro-scheduling: Resource Contention Relief in Multithreaded Programs

Yuanfang Chen and Xiaoming Li (University of Delaware, USA)

Co-efficient Vector Based Distributed Quasi-orthogonal Codes in Cooperative Networks

Gbenga Owajaiye and Yichuang Sun (University of Hertfordshire, United Kingdom)

AES Decryption Using Warp-synchronous Programming

Saddam Quirem and Byeong Lee (University of Texas at San Antonio, USA)

Hierarchical MATE's Approach for Dynamic Performance Tuning of Large-scale Parallel Applications

Andrea Martinez and Anna Sikora (Universitat Autònoma de Barcelona, Spain); Eduardo Cesar and Joan Sorribes (UAB, Spain)

Network State Aware Virtual Network Parallel Embedding

Xiaolin Chang, Bin Wang and Jiqiang Liu (Beijing Jiaotong University, P. R. China); Jogesh K. Muppala (Hong Kong University of Science and Technology, Hong Kong)

A Methodology for Implementation and Integration Two-factor Authentication into VPN

Thanh Pham and Keecheon Kim (Konkuk University, Korea)

Sensor Allocation to Multiple Applications in Shared Wireless Sensor Networks

Navdeep K Kapoor and Shikharesh Majumdar (Carleton University, Canada); Biswajit Nandy (Solana Networks, Canada)

Fixed Segmented LRU Cache Replacement Scheme with Selective Caching:

Kathlene Hurt and Byeong Kil Lee (University of Texas at San Antonio, USA)

Make Systematic Conformance Testing for BitTorrent Protocol Feasible: A CP-nets Model Based Testing Approach

Jing Liu (Inner Mongolia University, P. R. China); Haibo Wu (Institute of Computing Technology, CAS, P. R. China)

DAY ONE, SATURDAY, DECEMBER 1
9:10 - 10:10 A.M.

A DOUBLE-EDGED SWORD: IMPLICATIONS OF CROWDSOURCING FOR THE FUTURE OF WEB SECURITY

PROFESSOR BEN ZHAO, UNIVERSITY OF CALIFORNIA, SANTA BARBARA

Abstract:

Despite recent advancements in the areas of machine learning and data mining, there are still areas where human effort cannot be easily replicated by software systems. The rise of crowdsourcing systems such as Amazon Turk help fills this void by enabling the mobilization of human effort for large-scale computing tasks. Like many new techniques or systems, crowdsourcing systems are a double-edged sword capable of being used for either "good" or "evil."

In this talk, I will take a closer look at the impact of crowdsourcing on the security of web-services. I will focus on both positive and negative implications of crowdsourcing systems for the future. First, I will discuss how crowdsourcing can help us address difficult problems in dealing with fake online identities in online social networks.

I will describe recent work studying crowdsourced Sybil detection, using a large user study and several ground-truth datasets of fake and real users. Results show that in the right conditions, human workers can be highly accurate in identifying real and fake identities. In fact, we can build scalable systems for crowdsourced Sybil detection, and data from user studies show that it can provide highly accurate results with very low cost.

Second, I will discuss the negative implications of crowdsourcing, and describe a detailed measurement study on malicious "crowd-turfing" systems, where users sign up to perform tasks such as

spreading rumors, writing fake reviews, and creating fake online identities. Through both large scale data measurements and experiments, our study shows that these systems are highly scalable, and growing exponentially in both jobs and revenue, and pose a new type of threat to the security of today's online communities.

Speaker's Biography:

Ben Zhao is currently an Associate Professor at the Computer Science department, U. C. Santa Barbara. He completed his M.S. and Ph.D. degrees in Computer Science at U.C. Berkeley (2000, 2004), and his B.S. from Yale (1997). He is a recipient of the National Science Foundation's CAREER award, MIT Technology Review's TR-35 Award (Young Innovators Under 35), and Computer World Magazine's Top 40 Technology Innovators award.

His work has been covered by media outlets such as NY Times, Boston Globe, MIT Tech Review, NPR and Slashdot. His research spans areas of security and privacy, networked and distributed systems, wireless networks and data-intensive computing. Recently, he has spent much of his time measuring, analyzing, and modeling online social networks and large graphs, and the rest of his time building systems on smartphones and data center networks. He has chaired a number of workshops and conferences related to peer-to-peer networks (IPTPS, IEEE P2P) and online social networks (WOSN, WWW OSN track).

DAY TWO, SUNDAY, DECEMBER 2
9 - 10 A.M.

ON SCALABLE RESILIENCY IN EXASCALE COMPUTING ENVIRONMENTS

PROFESSOR TAIEB ZNATI, UNIVERSITY OF PITTSBURGH

Abstract:

As our reliance on IT continues to increase, future applications will involve the processing of massive amounts of data and will require an exascale computing infrastructure to support several orders-of-magnitude increases in the levels of parallelism. As technology continues to improve, two emerging trends will impact next generation exascale computing infrastructure: (1) The number of computing, communications and storage elements will continue to increase dramatically; (2) The growing disparity between the speeds of microprocessors and those of the memory and storage hierarchy mandates the incorporation of new classes of high density, low latency and low power non-volatile memory, such as Phase Change Memory (PCM), into the hierarchy. A direct implication of these trends is that the rate of failures in future cloud computing will increase dramatically, making resiliency a major concern in future exascale computing infrastructure to support compute- and data-intensive applications.

Unfortunately, current approach for resilience, which relies on automatic or application level checkpoint-restart, are not feasible in failure-prone computing environments as the time for checkpointing and rollback recovery is likely to exceed the mean time to failure. Addressing this shortcoming goes beyond adapting or optimizing well known and proven techniques, and calls for radical approaches to fault-tolerance in exascale computing infrastructures. The objective of this presentation is to explore innovative and scalable fault-tolerance mechanisms that, when integrated, will lead to efficient solutions for a "tunable" resiliency that takes into consideration the nature of the data and the requirements of the application. The focus will be on the design of an integrated framework that achieves high resiliency based on a new energy- and computation-aware approach to checkpointing and the design of scalable

mechanisms to ensure high-levels of data availability in a failure-prone environment.

Speaker's Biography:

Dr. Znati received a Ph.D. degree in Computer Science from Michigan State University in 1988, and a M.S. degree in Computer Science from Purdue University, in 1984. He is a Professor in the Department of Computer Science, with a joint appointment in Computer Engineering at the School of Engineering. Dr. Znati served as the Director of the Computer and Network Systems Division at the National Science Foundation. He also served as a Senior Program Director for networking research at the National Science Foundation. In this capacity, Dr. Znati led the Information Technology Research (ITR) Initiative, a cross-directorate research program, and served as the Committee Chair of the NSF Information Technology Research Initiative.

Dr. Znati's main research interests are in the design and analysis of evolvable, secure and resilient network architectures and protocols for wired and wireless communication networks, and the design of new fault-tolerant mechanisms for energy-aware resiliency in data-intensive computing. He is also interested in bio-inspired approaches to address complex computing and communications design issues that arise in large-scale heterogeneous wired and wireless networks.

Dr. Znati has served as the General Chair of several main conferences, including GlobeCom 2010, IEEE INFOCOM 2005, SECON 2004, the first IEEE conference on Sensor and Ad Hoc Communications and Networks, the Annual Simulation Symposium, and the Communication Networks and Distributed Systems Modeling and Simulation Conference. He also served or currently serves as a member of editorial boards of a number of networking, distributed system and security journals and transactions.



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