Welcome to the International Performance Computing and Communications Conference. In the past decades, IPCC has been a major platform for disseminating new research findings in computing and communication areas. This year, IPCC is celebrating its 28th birthday in the beautiful city of Phoenix. This year’s conference features a balanced participation from the high performance computing community and the computer network community, with increased participation on computer and networking security.

First let me give a quick overview of the conference. We have a highly packed two and half day program. We have nine conference paper sessions, and three workshop sessions featuring the hottest research topics in wireless networks and security. This year, we are honored to have three distinguished keynote speakers: Dr. Alhussein Abouzeid, a rising star in the area of optimization and computer networks from Arizona State University, and Dr. Edward Sha, a highly regarded expert in parallel and distributed systems from UT-Dallas. Dr. Abouzeid will give an inspiring talk on “The Science and Engineering of Computer Networks” and direct us to the future research opportunities; Dr. Larry Xue, will talk about QoS routing from the optimization perspective; and Dr. Edward Sha will update us with his most recent research on parallel embedded system design.

It is my pleasure to acknowledge the tremendous effort from the organizing committee, whose dedication is indispensable to the success of the conference. The two technical program committee chairs, Dr. Kuai Xu and Sheng Zhong worked closely every step of the way, and engaged a group of dedicated and highly efficient program committee members; The publications chair, Dr. Chengkai Li checked every single paper to make sure the papers meet the IEEE standard, and worked around clock to ensure the conference proceedings are delivered on time; The publicity chair, Dr. Xiaoming Li, worked very hard to ensure that we receive a large number of submissions from a wide range of authors on a broad spectrum of topics. Jack Chen, Neil Nelson and Nasr Ullah volunteered their valuable time to help us again this year. They played important roles at different stages of the conference from local arrangement to finance. I would also like to thank the workshop chairs who actively solicited and carefully selected a group of forward-looking workshop papers.

Obviously, there would not be a conference without a technical program committee. Our gratitude goes to the members of the program committee who volunteered their valuable time to review papers. Their expert opinions are the key to the high quality program of our conference. I’d also like to thank the authors who submitted their work to our conference. Without their support, this conference would not be a success.

Finally, the organizing committee of IPCC is grateful to the IEEE Computer Society for its sponsorship of the conference. We are thankful for the society’s continued support of IPCC.

On behalf of the conference committee, I extend you a warm welcome to the IPCC conference! We hope that you will enjoy the technical program and the social opportunity being offered at this pleasant hotel in this beautiful city.

Warmest Regards,

Maggie Cheng and Youtao Zhang
General Co-Chairs, IPCC 2009
SESSION 1A: SENSOR NETWORKS (GRANADA I)
Chair: Ronald P. Luijten (IBM Zurich Research Laboratory, CH)

A Universal Framework for Partial Coverage in Wireless Sensor Networks
Chinh Trung Vu (Georgia State University, US); Guantao Chen (Georgia State University, US); Yi Zhao (Georgia State University, US); Yingshu Li (Georgia State University, US)

ABC-MC: A Simple Multi-Channel Geographic Forwarding for Wireless Sensor Networks
Taekkyeon Lee (State University of New York at Buffalo, US); Chunming Qiao (State University of New York at Buffalo, US); Murat Demirbas (SUNY Buffalo, US); Jinhui Xu (State University of New York at Buffalo, US)

Static Worst-Case Energy and Lifetime Estimation of Wireless Sensor Networks
Yu Liu (Southern Illinois University Carbondale, US); Wei Zhang (Southern Illinois University Carbondale, US); Kemal Akkaya (Southern Illinois University Carbondale, US)

EDA: Event-oriented Data Aggregation in Sensor Networks
Ying Guo (Ocean University of China, CN); Feng Hong (Ocean University of China, CN); Zhongwen Guo (Ocean University of China, CN); Zongke Jin (Ocean University of China, CN); Yuan Feng (Ocean University of China, CN)

Real Time Clustering of Sensory Data in Wireless Sensor Networks
Longjiang Guo (Georgia State University, US); Chunyu Ai (Georgia State University, US); Xiaoming Wang (Shaanxi Normal University, CN); Zhipeng Cai (Mississippi State University, US); Yingshu Li (Georgia State University, US)

SESSION 1B: TRANSPORTATION AND PERFORMANCE (GRANADA II)
Chair: Lizhe Wang (Rochester Institute of Technology, US)

Multiple TCP Connections Improve HTTP Throughput – Myth or Fact?
Preethi Natarajan (Cisco Systems Inc, US); Fred Baker (Cisco Systems Inc, US); Paul Amer (University of Delaware, US)

On Performance-Adaptive Flow Control For Large Data Transfer in High Speed Networks
Xukang Lu (University of Memphis, US); Qishi Wu (University of Memphis, US); Nageswara Rao (Oak Ridge National Laboratory, US); Zongmin Wang (Zhengzhou University, CN)

Pre-Congestion Notification Based Flow Management in MPLS-based DiffServ Networks
Mayutun Arumalihurai (University of Goettingen, DE); Ruediger Geib (University of Goettingen, DE); Rene Rex (University of Goettingen, DE); Xiaoming Fu (University of Goettingen, DE)

Towards Zero Loss for TCP in Wireless Networks
Jing Chen (Chinese Academy of Sciences, CN); Wei Tan (Baidu, Inc, CN); Lixiang Liu (Chinese Academy of Sciences, CN); Xiaohu Hu (Chinese Academy of Sciences, CN); Fanjiang Xu (Chinese Academy of Sciences, CN)

Saturation Aware TCP Throughput Prediction
Jia Zhou (Tsinghua University, CN); Fuquan Ren (Tsinghua University, CN); Chuang Lin (Tsinghua University, CN)

LUNCH: ALICANTE PATIO (outdoors) / VALENCIA III (backup), 12:00 – 1:30

SESSION 2A: ENERGY EFFICIENCY (GRANADA I)
Chair: Lizhe Wang (Rochester Institute of Technology, US)

ECOS: An Energy-Efficient Cluster Storage System
Xiaojun Ruan (Auburn University, US); Shu Yin (Auburn University, US); Adam Manzanares (Auburn University, US); Zhiyang Ding (Auburn University, US); James Majors (Auburn University, US); Xiao Qin (Auburn University, US)

Improving Reliability of Energy-Efficient Storage System by Disks Swapping
Shu Yin (Auburn University, US); Xiaojun Ruan (Auburn University, US); Adam Manzanares (Auburn University, US); Zhiyang Ding (Auburn University, US); James Majors (Auburn University, US); Xiao Qin (Auburn University, US)

Performance Evaluation of Power Aware Routing Algorithms in Personal Networks
Javad Vazifehdan (Delft University of Technology, NL); Ramin Hekmat (Delft University of Technology, NL); R. Venkatesha Prasad (Delft University of Technology, NL); Ignas Niemegeers (Delft University of Technology, NL)

Virtual Center: a Characteristic of Minimum Power Broadcast Trees in Wireless Ad Hoc Networks
Manki Min (South Dakota State University, US); Bipin Neupane (South Dakota State University, US)

Space-Efficient Predictive Block Management
David Essary (University of Pittsburgh, US); Ahmed Amer (University of California, Santa Cruz, US)

SESSION 2B: PERFORMANCE IN COMPUTING AND COMMUNICATIONS (GRANADA II)
Chair: Wei Hao (Northern Kentucky University, US)

A User-centric Dynamic Cluster Partitioning Approach for HPC Service Optimization
Xiaorong Li (Institute of High Performance Computing, SG); Xiaorong Li (Institute of High Performance Computing, SG); Terence Hung (Institute of High Performance Computing, SG); Sharad Singhal (HP Labs, US)

Using Shared Parity Disks to Improve the Reliability of RAID Arrays
Jehan-Francois Paris (University of Houston, US); Ahmed Amer (Santa Clara University, US)

Optimization of Link Bandwidth for Parallel Communication Performance
Lydia Chen (IBM Zurich Research Laboratory, CH); Wolfgang Denzel (IBM Zurich Research Laboratory, CH); Ronald Luijten (IBM Zurich Research Laboratory, CH)

Improving File Tree Traversal Performance by Scheduling I/O Operations in User Space
Carl Henrik Lunde (University of Oslo, NO); Håvard Espeland (University of Oslo, NO); Håkon K Stensland (Simula Research Laboratory, NO); Pål Halvorsen (Simula Research Laboratory, NO)

Achieving High Performance Web Applications by Service and Database Replications at Edge Servers
Wei Hao (Northern Kentucky University, US); Jicheng Fu (University of Central Oklahoma, US); I-Ling Yen (University of Texas at Dallas, US); Zhonghang Xia (Western Kentucky University)

BREAK: SOUTH FOYER, 2:30 P.M. - 3:00 P.M.

SESSION 2: 3:00 – 5:00 P.M.

RECEPTION: VALENCIA III, 5:30 - 7:30 P.M.
Broadband wireless sits at the confluence of the most remarkable growth stories of the telecommunications industry in recent years. Both wireless and broadband have on their own enjoyed rapid mass-market adoption. Broadband wireless is about bringing the broadband experience to a wireless context, which offers users certain unique benefits and convenience.

Emerging technologies of broadband wireless and cellular-like Mobile WiMAX based on IEEE 802.16e standard, long-term evolution (LTE) networks, HSDPA, WiRAN, etc are expected to not only compete with the broadband wireless market share in urban areas with DSL, cable, and optical fibers, but also threaten the hotspot based WiFi and even the voice-oriented cellular wireless market. The success of those services depends on the way network operators, wireless equipment vendors and service providers will deal with the stringent constraints imposed by the underlying wireless architecture. Seamless and ubiquitous coverage is a crucial point to face.

Workshop Co-Chairs
TARU ALI YAHYA (Paris-Sud University, France)
HAKIMA CHAOUCI (Telecom Sud Paris)

Technical Program Committee Members:
ALAIN MOURAD, SAMSUNG ELECTRONICS RESEARCH INSTITUTE, UK
ALINE VIANA, INRIA SACLAY, FRANCE
ANDRE-LUC BEYLOT, ENSISÉEHT, FRANCE
ANIELISE MUNARETTI, UTFPR, BRAZIL
FAOUZI BADER, CTTC, SPAIN

Technical Program Committee Chairs:
FAOUZI BADER, CTTC, SPAIN
ALAIN MOURAD, SAMSUNG ELECTRONICS RESEARCH INSTITUTE, UK

New policies and regulatory rules for more efficient allocation and utilization of spectrum have been at the center of current discussions involving governments, industry and academia. For example, on November 14, 2008, the US Federal Communications Commission (FCC) adopted the rules that allow unlicensed transmitters to operate in TV bands on a secondary basis. Dynamic Spectrum Access (DSA) and Cognitive Radio Networks (CRNs) are considered as the two key technologies that will enable flexible, efficient and reliable spectrum use by adapting radio operating characteristics to the real-time conditions of the environment. This workshop will focus on key research challenges related to the dynamic spectrum access paradigm and cognitive radio networks, and it is intended to be a forum for collaboration across multiple communities, ranging from academic to government to industry.

Workshop Co-Chairs
CHUN-TING CHO (National Taiwan University, Taiwan)
HUI-SONG YU (National Taiwan University, Taiwan)

Technical Program Committee Members:
EDWARD AU, INSTITUTE FOR INFocomm RESEARCH, SINGAPORE
MONTISHA GHOSH, PHILIPS RESEARCH NORTH AMERICA, USA
LI-CHEW WANG, NATIONAL CHIAO TUNG UNIVERSITY, TAIWAN
CARLOS CORDEIRO, INTEL CORPORATION, USA
SAI SHANKAR, BROADCOM, USA
KYOSEI KITASATO, GEORGIA INSTITUTE OF TECHNOLOGY, USA
STEFAN MAGNOLD, SWISSCOM INNOVATIONS, SWITZERLAND
R. CHANDRAMOOLI, STEVENS INSTITUTE OF TECHNOLOGY, USA
SHIKANTHANARAYANA SRIDHARAN, INTEL CORPORATION, USA
JAIPEER WANG, PHILIPS RESEARCH NORTH AMERICA, USA
HONG GANG ZHANG, ZHEJIANG UNIVERSITY, CHINA
VAHD TARIKH, Harvard University, USA
TOMMASO MELODIA, SUNY BUFFALO, USA
HUNG-YUN HUEN, NATIONAL TAIWAN UNIVERSITY, TAIWAN
PENG-CHENG YEN, NATIONAL TAIWAN UNIVERSITY, TAIWAN
KEVIN L. DIAS, DELL, NATIONAL TAIWAN UNIVERSITY, PARANAS
VASILIS FRIDERIKOS, KING’S COLLEGE OF LONDON, UK

Increasing reliance on the Internet for business and commercial purposes and the global availability of information has resulted in a whole suite of problems that are rooted in information assurance. As more and more complex systems evolve, the need for security and data assurance grows even more. Large corporations and research institutions regularly come up with solutions to counter malicious and non-malici- ous, external and internal threats. However, the field of information assurance is such that new threats evolve on a regular basis and continuous research and innovation is critical to stem the threats that continually arise. Information Assurance can then be defined as the protection and defense of information systems so as to ensure the authenticity, availability, confidentiality, integrity, and non-repudiation of critical data and user credentials. Authentication is a direct approach to information assurance, where the external party is asked to prove its authenticity. This can be achieved by encryption, certification or some previously agreed upon protocol. Confidentiality and integrity cover the areas of data protection by directly modifying the data using encryption or keeping the data in secure backed-up locations. The goal of non-repudiation is that an entity that has proven its identity should also be held responsible for its actions.

Workshop Co-Chairs:
ANURAG GUPTA (Google Inc.) ANURAG.GUPTA@IEEE.ORG
ANNINO MUKHERJEE (Google Inc.) ANINDOM@GMAIL.COM

Technical Program Committee Members:
ANDRE-LUC BEYLOT, ENSISÉEHT, FRANCE
ARTUR HECKER, TELECOM PARISTECH
AVINASH SRINIVASAN, BLOOMBERG UNIVERSITY
DEEPA KUNDUR, TEXAS A&M UNIVERSITY
FALVCO DONG, UNIVERSITY OF ERLANGEN
HAI TANG WANG, MOTOROLA INC.
HARIMA CHAOUCI, INT
HONOMEI DENJO, INTELLIGENT AUTOMATION INC.
HUI SONG, FROSTBURG STATE UNIVERSITY
IKAN GANCHEV, UNIVERSITY OF LUMBER
JIN LI, UNIVERSITY OF OREGON
MARCO CREMONINI, UNIVERSITÀ DI MILANO
MENG YU, WESTERN ILLINOIS UNIVERSITY
MOHAMAD BADRA, L’IMOS LABORATORY, CNRS FRANCE
MUKESH SINGHAL, UNIVERSITY OF KENTUCKY
SHIVAKANT MISHRA, UNIVERSITY OF COLORADO
SOIKRATIS KATSIKAS, UNIVERSITY OF PIRAEUS
STEPHAN EIDENBENZ, LOS ALAMOS NATIONAL LABORATORY
YU ChE, UNIVERSITY OF FLORIDA
YONGYING CHEN, STEVENS INSTITUTE OF TECHNOLOGY
YU CHEN, STATE UNIVERSITY OF NEW YORK, BINGHAMTON
ZHEN JIANG, WEST CHESTER UNIVERSITY OF PENNSYLVANIA

End of IPCCC schedule
KEYNOTE SPEAKERS

MONDAY, DECEMBER 14, 8:30 A.M. - 9:30 A.M

ALHUSSEIN A. ABOUZEID, PH.D., ON THE SCIENCE AND ENGINEERING OF COMPUTER NETWORKS

Dr. Abouzeid is currently program director in the Computer and Network Systems division of the National Science Foundation. He is also associate professor, on leave, with the department of Electrical, Computer, and Systems Engineering at Rensselaer Polytechnic Institute and Deputy Director of the Center for Pervasive Computing and Networking, which he co-founded. He received his Ph.D. in Electrical Engineering from University of Washington, Seattle, in 2001, and has been with RPI since then. His current research interest is variable topology networks, which includes wireless ad-hoc and sensor networks, delay and disruption-tolerant networks, and peer-to-peer overlay networks. The research focuses on protocols for coping with, and sometimes leveraging, the various aspects of variability in computer networks, including mobility, wireless channel variation, and heterogeneity. He received an NSF CAREER award in 2006 for his project "Multiple-Layer Modeling and Design of Wireless Ad Hoc Networks".

MONDAY, DECEMBER 14, 1:30 P.M. - 2:30 P.M.

GUOLIANG (LARRY) XUE, PH.D., COMPUTING A PATH SUBJECT TO MULTIPLE CONSTRAINTS: ADVANCES AND CHALLENGES

Abstract: A fundamental problem in quality of service (QoS) routing is to find a path between a specified source node and a destination node that satisfies K additive QoS constraints, where K>=2 is a constant. This problem is known to be NP-hard, and has been extensively studied for the case of K=2, where the two QoS parameters denote cost and delay, respectively. Existing approaches to this problem can generally be divided into two classes: simple heuristics that do not provide performance guarantees, or sophisticated approximation algorithms that provide worst case performance guarantees but are complicated for implementation. In this talk, we will present some recent advances for solving the general problem with K>=2 QoS constraints. These include faster (1+epsilon)-approximation algorithms, and a class of K-approximation algorithms which run as fast as a well-known shortest path algorithm. We will also look at the challenges and opportunities along this line of research.

Speaker Bio: Guoliang (Larry) Xue is a Professor of Computer Science and Engineering at Arizona State University. He received the PhD degree in Computer Science from the University of Minnesota in 1991. He has held previous positions as Assistant/Associate Professor of Computer Science at the University of Vermont. His research interests include quality of service routing, resource allocation in wireless networks, and relay node placement in wireless sensor networks. He currently serves on the editorial boards of Computer Networks, IEEE Transactions on Wireless Communications, and IEEE Network Magazine. He is a TPC co-Chair of IPCCC2003, and a TPC co-Chair of INFOCOM2010. More information can be found at: optimization.asu.edu/~xue.

TUESDAY, DECEMBER 15, 8:30 A.M. - 9:30 A.M

EDWIN SHA, PH.D., PARALLEL EMBEDDED SYSTEMS: OPTIMIZATION AND CHALLENGES

Abstract: Computing systems are now moving toward “parallel” rapidly such as VLIW, multi-core, and multi-processor systems. However, software designers are not yet ready for this change. People still wonder how to maximize parallelism of applications in order to fully use the resources, how to reduce the memory overhead that is becoming the most serious bottleneck for system performance, how to use hardware/software to secure a system, and how to reduce power consumption. There are many optimization problems in this area that deserve to conduct serious research, in particular, how to automatically parallelize loops and how to reduce the memory overhead. This talk will present some of our research results developed in these years for various types of optimization problems in security, bus minimization, timing and parallelization optimization, code size, memory overhead and power consumption minimization, etc. Many of our techniques give the best known results available in literatures.

Speaker Bio: Dr. Edwin Sha received his Masters and Ph.D. degree from the Department of Computer Science, Princeton University, USA in 1991 and 1992, respectively. From August 1992 to August 2000, he was a faculty member in the Department of Computer Science and Engineering at University of Notre Dame, USA, and served as the Associate Chair since 1995. Since 2000, he has been a tenured full professor in the Department of Computer Science at the University of Texas at Dallas (UTD).

He has published more than 260 research papers including more than 70 journal articles. He has been serving as editor for many premier journals including several IEEE Transactions, and as program committee members and Chairs in numerous international conferences. He received the Oak Ridge Association Junior Faculty Award, NSF CAREER Award, Notre Dame CSE Teaching Award, Microsoft Trustworthy Computing Curriculum Award, NSFC Overseas Distinguished Young Scholar, and Chinese Changjiang Scholar Honorary Chair Professor. He served as the conference chairs for many international conferences such as GLSVLSI, PDCS 2000, PDCS 2001, SecUbic 2005, PDES 2005, EUC 2006, ESO 2006, EUC 2007, ESO 2007, SEC 2008, EM-Com 2009, etc. His web page can be found at: www.utdallas.edu/~edsha
PRELIMINARY CALL FOR PAPERS AND PARTICIPATION

29TH IEEE INTERNATIONAL PERFORMANCE, COMPUTING, AND COMMUNICATIONS CONFERENCE

December, 2010
Albuquerque, New Mexico

SPONSORED BY THE IEEE COMPUTER SOCIETY

The International Performance, Computing, and Communications Conference is the premier IEEE conference presenting research in the performance of computer and communication systems.

For almost three decades, IPCCC has been a research forum for academic, industrial, and government researchers.

Hot Topics For IPCCC 2010

We encourage submission of high-quality papers reporting original work in both theoretical and experimental research areas. Topics of interest include, but are not limited to, the following:

- Mobile and Networked Applications
- Hybrid and Ad Hoc Networking
- Sensor Network Protocols and Applications
- Performance Evaluation
- Performance of Web Servers
- Performance of Workloads
- High-Performance Computing
- Power-Aware Design
- Grid Computing
- Embedded Systems
- Storage Systems
- Network Protocols
- Network Information Assurance
- Network Computing

Submissions Procedures

Submission instructions and procedures are available at the IPCCC web site at: www.ipccc.org

All papers will be reviewed by the Program Committee. They will be judged with respect to their quality, originality, and relevance. Accepted papers will be published in the conference proceedings, conditional upon the author's advance registration. Awards will be given for the best paper.

Questions regarding the policies and procedures can be sent to the IEEE IPCCC 2010 General Chairs.

In addition, proposals for panel sessions and workshops are welcome. Please contact the General Chair, listed above, for details.

- Panel sessions: on topics of timely importance.
- Workshops: on relevant topics, half or full-day.

WWW.IPCCC.ORG