The 2010 IEEE/ACM International Conference on Green Computing and Communications (GreenCom 2010)

The 2010 IEEE/ACM Cyber, Physical and Social Computing (CPSCom 2010)

December 18-20, 2010
Hangzhou, China
Conference Program and Information Booklet

Organized by
Zhejiang University, China
St. Francis Xavier University, Canada

Sponsored by
IEEE, IEEE Computer Society, ACM China
IEEE Technical Committe on Scalable Computing
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# CPSCom/GreenCom 2010 Program Overview

## Saturday, December 18, 2010

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<td>08:20-9:10</td>
<td>Meeting Room 3</td>
<td>GreenCom keynote: Mohammad S. Obaidat</td>
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<td>9:10-10:00</td>
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<td>GreenCom keynote: George L.-T. Chiu</td>
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<td>10:00-10:20</td>
<td>Conference Center 1</td>
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<td>10:20-11:10</td>
<td>Conference Center 2</td>
<td>APESER keynote: Marco Di Natale</td>
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<td>11:10-12:00</td>
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<td>APESER keynote: Shangping Ren</td>
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<td>12:00-13:30</td>
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<td>Lunch (Jinxi Hotel)</td>
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<tr>
<td>13:30-15:10</td>
<td>CPSCom1</td>
<td>CPSCom1</td>
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<tr>
<td>15:10-15:30</td>
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<td>Coffee Break</td>
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<tr>
<td>15:30-16:45</td>
<td>CPSCom2</td>
<td>CPSCom2</td>
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<td>19:00-20:30</td>
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## Sunday, December 19, 2010

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<tr>
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<td>CPSCom keynote: Kay Chen Tan</td>
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<td>09:10-10:00</td>
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<td>IOTS keynote: Huadong Ma</td>
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<td>10:20-11:10</td>
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<td>APESER keynote: Chenyang Lu</td>
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<td>11:10-12:00</td>
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<td>CPSCom keynote: Feiyue Wang</td>
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<td>13:30-15:10</td>
<td>CPSCom4</td>
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<td>Coffee Break</td>
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<tr>
<td>15:30-16:45</td>
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<td>Panel1 (Research Directions and Opportunities in Cyber, Physical, and Social Computing)</td>
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<td>16:45-18:00</td>
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<td>Panel 2 (Current Trends in Low Power Computing and Communication Systems)</td>
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<td>GreenCom keynote: Hai Jin</td>
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<td>10:20-11:10</td>
<td>GreenCom keynote: Luoning Gui</td>
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<td>APESER keynote: Samarjit Chakraborty</td>
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Qinxia Li, Huazhong University of Science and Technology, China
Jin Zhang, Huazhong University of Science and Technology, China
Yan Dong, Huazhong University of Science and Technology, China
Keynote: Trends in Green Information and Communication Technology and Samples of our Related Research Works

Mohammad S. Obaidat, Monmouth University, USA

About the keynote speaker

Professor Mohammad S. Obaidat is an internationally well known academic/researcher/scholar. He received his Ph.D. and M.S. degrees in Computer Engineering with a minor in Computer Science from The Ohio State University, Columbus, Ohio, USA. Dr. Obaidat is currently a full Professor of Computer Science at Monmouth University, NJ, USA. Among his previous positions are Chair of the Department of Computer Science and Director of the Graduate Program at Monmouth University and a faculty member at the City University of New York. He has received extensive research funding and has published ten (10) books and over four hundred and sixty (460) refereed technical articles in scholarly international journals and proceedings of international conferences, and currently working on three more books. Prof. Obaidat is the author of a new upcoming book: Wireless Sensor Networks (Cambridge University Press). He is also the editor to 2 new upcoming books: Cooperative Networking (John Wiley & Sons 2010) and Pervasive Computing and Networking (John Wiley & Sons 2010). Prof. Obaidat is the author of the book entitled: "Fundamentals of Performance Evaluation of Computer and Telecommunications Systems," by John Wiley & Sons in 2010. Dr. Obaidat is the Editor of the Book entitled, "E-business and Telecommunication Networks", published by Springer in 2008. He is the co-author of the book entitled, "Security of e-Systems and Computer Networks" published by Cambridge University Press in 2007. He is the co-author of the Best Selling Book, "Wireless Networks" and "Multiwavelength Optical LANs" published by John Willy & Sons (2003). Obaidat is the editor of the book, APPLIED SYSTEM SIMULATION: Methodologies and Applications, published by Kluwer (now Springer) in 2003.

We use the ideas of naturally occurring ants' foraging behavior and based on such ideas we design an energy-aware routing protocol, which not only incorporates the effect of power consumption in routing a packet, but also exploits the multi-path transmission properties of ant swarms and, hence, increases the battery life of a node. The efficiency of the protocol with respect to some of the existing ones has been established through simulation analysis. We formulate the sensor recharge problem in wireless sensor networks with rechargeable sensor nodes as a Markov Decision Processes (MDP) problem and have formulated policies to find at which level recharging is optimum. We offered a generalized formula for calculating the delay of recharge. The theoretical as well as the simulated recharge delay are compared for different policies to get the optimum one. Other related research efforts by our group will be presented.
Keynote: Massively Parallel, Green Supercomputers
George L.-T. Chiu, Thomas J. Watson Research Center, USA

About the keynote speaker

George Liang-Tai Chiu (Fellow, IEEE) is the Senior Manager of Advanced High Performance Systems in the Systems Department at the Thomas J. Watson Research Center, responsible for the overall hardware and software of the Blue Gene Platform. He received a Ph.D. degree in astrophysics from the University of California at Berkeley in 1978, and an MS degree in Computer Science from Polytechnic University in 1995. He joined IBM in 1980 after having been on the staff of Yale University.

Dr. Chiu has worked on picosecond device and internal node characterization, laser beam and electron beam contactless testing techniques, functional testing of chips and packages, optical lithography, display technologies, computer packaging, and supercomputing. He is one of the three co-founders of the Blue Gene project, and he has been in charge of the Blue Gene supercomputer since 1999. In 2007, he became the Principal Investigator of the Nuclear Energy Advanced Modeling and Simulations (NEAMS) project. He has published numerous papers and taught many short courses in the areas mentioned above. He holds fifty one patents internationally. He received an IBM Corporate Award in 2005, the Gerstner Award for Client Excellence in 2005, the EE ACE Awards as part of the Blue Gene/L System Design Team in 2005, three IBM Outstanding Technical Achievement Awards, nine Invention Achievement Awards from IBM, and National Medal of Technology and Innovation on Blue Gene from the US Department of Energy in 2009. Dr. Chiu is a member of the International Astronomical Union, IBM Academy of Technology, and a Fellow of the Institute of Electrical and Electronics Engineers.

Summary:

After 35 years of scaling CMOS, today silicon devices’ power dissipation is limiting the performance across the entire spectrum of computing platforms from handheld consumer devices to workstations, and to mainframes and high performance computers (HPC). While the tradeoff between power and performance is well recognized, most recent studies focus on either low-power, low-performance systems or high-power, high-performance systems. The IBM Blue Gene HPC platform started a trend by concentrating instead on a low power, high performance designs. An order of magnitude improvement in power efficiency can be attained without system performance loss in parallelizable applications – those in which such efficiency is most critical. In this talk, solutions for the key components of an HPC are discussed, using the IBM Blue Gene system as a case study to illustrate practical low power directions. From the current petascale HPC systems to the future exascale designs, power reduction will demand even more holistic tradeoffs in device technologies, computer architecture, system software and applications. This talk addresses the fundamental issue of reducing dissipation in the active mode, which is particularly relevant to applications in high performance computing with a high activity factor.
Keynote: Research Experiences on Green Computing in Virtualized System
Hai Jin, Huazhong University of Science and Technology, China

About the keynote speaker

Hai Jin is a Cheung Kung Scholars Chair Professor of computer science and engineering at the Huazhong University of Science and Technology (HUST) in China. He is now Dean of the School of Computer Science and Technology at HUST. Jin received his PhD in computer engineering from HUST in 1994. In 1996, he was awarded a German Academic Exchange Service fellowship to visit the Technical University of Chemnitz in Germany. Jin worked at The University of Hong Kong between 1998 and 2000, and as a visiting scholar at the University of Southern California between 1999 and 2000. He was awarded Excellent Youth Award from the National Science Foundation of China in 2001. Jin is the chief scientist of ChinaGrid, the largest grid computing project in China, and the chief scientist of National 973 Basic Research Program Project of Virtualization Technology of Computing System. Jin is a senior member of the IEEE and a member of the ACM. Jin is the member of Grid Forum Steering Group (GFSG). He has co-authored 15 books and published over 400 research papers. His research interests include computer architecture, virtualization technology, cluster computing and grid computing, peer-to-peer computing, network storage, and network security.

Jin is the steering committee chair of International Conference on Grid and Pervasive Computing (GPC), Asia-Pacific Services Computing Conference (APSCC), International Conference on Frontier of Computer Science and Technology (FCST), and Annual ChinaGrid Conference. Jin is a member of the steering committee of the IEEE/ACM International Symposium on Cluster Computing and the Grid (CCGrid), the IFIP International Conference on Network and Parallel Computing (NPC), and the International Conference on Grid and Cooperative Computing (GCC), International Conference on Autonomic and Trusted Computing (ATC), International Conference on Ubiquitous Intelligence and Computing (UIC).

Summary:

Green computing is a hot topic in these years and has attracted many researchers to focus on some typical issues, including energy saving problems in operating system and network transmission system. Now, with the development of virtualization technologies, system software has different layer concept (including physical machine, VMM and several VMs), which will make the traditional energy saving technologies invalid. For example, in client virtualization, different VMs have different energy saving decisions in their operating systems, which have conflict in VMM layer. But, on the other side, virtualization technologies can build a promising energy saving framework for data centers with the help of VM migrations in easier way than ever. So, it is important to find out the impact of virtualization technologies on computer systems and build a green map. Here, we will give our understanding on the problem and report some research experiences on green virtualized systems.
Keynote: GreenTouch: Inventing Sustainable, Ultra Energy-Efficient ICT Networks

Luoning Gui, Alcatel-Lucent Bell Lab, China

About the keynote speaker

Dr. Luoning Gui has built up the R&I center from the very beginning in 2002. He is a senior vice-president, now the head of R&I/Bell Lab in China leading the organization to explore advanced research and innovation with the mission to create disruptive new technologies that is to be transferred to Solutions and Marketing organization, Product/Services group, or that can be directly turned into an internal venture, or that can be technology licensed.

Luoning Gui got his PhD in communication engineering from the University of Electronic Science and Technology of China in 1993 and his MBA from Fudan University- BI Norwegian School of Management in 2005. He started his research work in Ethernet from 1984 to 1987, Spread Spectrum Radio system from 1987 to 1989, then ATM and IP switching from 1989 to 1996. He holds more than 20 patents worldwide.

Summary:

The presentation first addresses the opportunities for ICT in reduction of global carbon emission, then gives an introduction for Green Touch, including its mission, goal, members, the way it is organized and most recent progresses. Followed by the detailed technology areas in green research, such as Wireline, and Wireless (Massive MIMO & Small cell), finally, we summarize on what we contribute collectively to green communications.
The 2010 IEEE/ACM Internet of Things Symposium (IOTS 2010)

Keynote: Basic Research on the Architecture of Internet of Things
Huadong Ma, Beijing University of Posts and Telecommunications, China

About the keynote speaker

Prof. Huadong Ma is Chief Scientist of the project “Basic Research on the Architecture of Internet of Things” supported by the National 973 Program of China. He is Executive Dean, School of Computer Science, Beijing University of Posts and Telecommunications (BUPT), China. He is also Director of Beijing Key Lab of Intelligent Telecommunications Software and Multimedia, BUPT. He was awarded National Funds for Distinguished Young Scientists in 2009.

He received his Ph.D. degree in Computer Science from Institute of Computing Technology, Chinese Academy of Science in 1995. He visited UNU/IIST as research fellow in 1998 and 1999, respectively. From 1999 to 2000, he held a visiting position in the Department of Electrical Engineering and Computer Science, The University of Michigan, Ann Arbor, Michigan, USA. He was a visiting Professor at The University of Texas at Arlington from July to September 2004, and a visiting Professor at Hong Kong University of Science and Technology from Dec. 2006 to Feb. 2007. His current research focuses on multimedia system and networking, sensor networks and Internet of things, and he has published over 100 papers in journals (such as ACM/IEEE Transactions) or Conferences (such as IEEE INFOCOM/ICDSC, ACM MM) and 4 books on these fields. His email address is mhd@bupt.edu.cn.

Summary:

Internet of Things (IoT) will enable the interconnection and integration of the physical world and the cyber space, and be leading the trend of future network development as well as the third wave of the information industry revolution. This talk introduces the project “Basic Research on the Architecture of Internet of Things” supported by the National Basic Research Program of China (973 Program). The details include the background, scientific problems, research contents, and objectives.
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<tr>
<td>09:10-10:00</td>
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**GreenCom 1: Wireless Sensor Networks**  
**Session Chair: Gang Pan**  
1. Detection of Identity-Based Attacks in Wireless Sensor Networks Using Signalprints  
   Sudip Misra, Ashim Ghosh, A. P. Sagar P., and Mohammad S. Obaidat  
   Guowei Wu, Heqian Li, and Lin Yao  
3. A Practical Localization Algorithm Based on Wireless Sensor Networks  
   Tao Huang, Zhikui Chen, Feng Xia, Cheng Jin, and Liang Li  
   Zhiqi Wang, Liang Chen, Zusheng Zhang, and Fengqi Yu

**GreenCom 2: Mobile Computing**  
**Session Chair: Le Wang**  
1. Energy Source Aware Target Cell Selection and Coverage Optimization for Power Saving in Cellular Networks  
   Juejia Zhou, Mingju Li, Liu Liu, Xiaoming She, and Lan Chen  
2. Using Compression Energy Efficiently in Mobile Environment  
   Eero Sillasto, Le Wang, and Jukka Manner  
   Weishan Zhang, Klaus Marius Hansen, João Fernandes, Julian Schütte, and Francisco M. Lardies  
4. A System-Level Model for Runtime Power Estimation on Mobile Devices  
   Yu Xiao, Rijubrata Bhaumik, Zhirong Yang, Matti Siekkinen, Petri Savolainen, and Antti Ylä-Jääski

**GreenCom 3: Computer Architecture and Embedded System I**  
**Session Chair: Hong Li**  
5. A Structural Customization Approach for Low Power Embedded Systems Design  
   Hui Guo  
6. Understanding Power Measurement Implications in the Green500 List  
   Balaji Subramaniam and Wu-chun Feng

**GreenCom 4: Energy Aware Applications**  
**Session Chair: Weishan Zhang**  
1. On Profiling the Energy Consumption of Distributed Simulations: A Case Study  
   Miguel A. Erazo, Roberto Pereira  
   Balaji Subramaniam, Wu-chun Feng  
3. Enabling Energy-efficient Analysis of Massive Neural Signals using GPGPU  
   Dan Chen, Lizhe Wang, Shuating Wang, Muzhou Xiong, Gregor von Laszewski, Xiaoli Li  
   Zhuowei Wang, Xianbin Xu, Naixue Xiong, Laurence T Yang, Wuqing Zhao
GreenCom 5 Networking I
Session Chair: Dan Chen
1. Power-Aware Parallel Forwarding: An Optimization Study
   Weirong Jiang and Yaxuan Qi
2. An Energy Efficient IP over WDM Network
   Xiaowen Dong, Taisir El-Gorashi, and Jaafar M. H. Elmirghani
3. Energy Consumption Analysis of WLAN, 2G and 3G interfaces
   Le Wang, Jukka Manner
4. Reconfiguration of Wireless Communications Network Architecture for Supporting Power Efficient Transmission
   Xiaoming Tao, Hui Deng, Tengfei Xing, Jianhua Lu

GreenCom 6 Virtualization
Session Chair: Xiaomin Zhu
1. PCFS: Power Credit based Fair Scheduler under DVFS for multicore Virtualization Platform
   Chengjian Wen, Jun He, Jiong Zhang, and Xiang Long
   Kejiang Ye, Dawei Huang, Xiaohong Jiang, Huajun Chen, and Shuang Wu
3. Multi-objective Virtual Machine Placement in Virtualized Data Center Environments
   Jing Xu and Jose Fortes

Sunday, December 19, 2010

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<td>16.45-18.00</td>
<td>GreenCom Panel (Chair: Tianzhou Chen/Zonghua Gu)</td>
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GreenCom 2010 Panel

Title: Current Trends in Low Power Computing and Communication Systems

Panelists:

Tianzhou Chen (Chair), Zhejiang University, China
Zonghua Gu (Chair), Zhejiang University, China
George Chiu, IEEE Fellow, IBM, USA
Mohammad S. Obaidat, IEEE and SCS Fellow, Monmouth University, USA
Rong Ge, Marquette University, USA
Luoning Gui, Alcatel-Lucent Bell Lab, China
Honggang Zhang, Zhejiang University, China
Darren J Kerbyson, Pacific Northwest National Laboratory, USA
Monday, December 20, 2010

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**GreenCom 7: Computer Architecture and Embedded Computing II**

Session Chair: Heshan Lin

1. Evaluating Parallel I/O Energy Efficiency  
Rong Ge  
2. Characterizing Performance and Power of GPU Applications with DVFS  
Yang Jiao, Heshan Lin, Wu-chun Feng  
3. Designing Energy Efficient Communication Runtime Systems for Data Centric Programming Models  
Abhinav Vishnu, Shuaizen Song, Andres Marquez, Kevin Barker, Darren Kerbyson, Kirk Cameron, Pavan Balaji

**GreenCom 8: Grid, Cloud and Data Center Computing**

Session Chair: Yan-Qing Zhang

1. An Analysis of Power Consumption Logs from a Monitored Grid Site  
Marcos Dias de Assunção, Anne-Cécile Orgerie, and Laurent Lefèvre  
2. DENS: Data Center Energy-Efficient Network-Aware Scheduling  
Dzmitry Kliazovich, Pascal Bouvry, and Samee Ullah Khan  
3. Green Task Scheduling Algorithms with Speeds Optimization on Heterogeneous Cloud Servers  
Luna Mingyi Zhang, Keqin Li, and Yan-Qing Zhang  
4. Power Reduction Scheme of Fans in a Blade System by Considering the Imbalance of CPU Temperatures  
Yuetsu Kodama, Satoshi Itoh, Toshiyuki Shimizu, Satoshi Sekiguchi, Hiroshi Nakamura, and Naohiko Morii

**GreenCom 9: Multicore and Manycore Computing**

Session Chair: Bing Guo

1. Task Allocation and Migration Algorithm for Temperature-Constrained Real-Time Multi-Core Systems  
Guowei Wu, Zichuan Xu, Qiu Fen Xia, Jiankang Ren, and Feng Xia  
2. Shared Register File Based ILP for Multicore  
Lihan Ju, Wei Hu, Lingxiang Xiang, and Tianzhou Chen  
3. Energy-Aware Loop Parallelism Maximization for Multi-core DSP Architectures  
Meikang Qiu, Jian-Wei Niu, Laurence T. Yang, Xiao Qin, Senlin Zhang, and Bin Wang

**GreenCom 10: Cluster Computing I**

Session Chair: Yu Cai

1. Intelligent Power Management Over Large Clusters  
A. Stephen McGough, Clive Gerrard, Paul Haldane, Dave Sharples, Dan Swan, Paul Robinson, Sindre Hamlander, and Stuart Wheeler  
2. Markov Model Based Power Management in Server Clusters  
Xinying Zheng and Yu Cai  
3. AppFlow: Autonomic Performance-Per-Watt Management of Large-Scale Data Centers  
Bithika Khargharia, Haotong Luo, Youssif Al-Nashif, and Salim Hariri
GreenCom 11 Networking II
Session Chair: Kodama Yuetsu
1. Minimizing Routing Energy Consumption: from Theoretical to Practical Results
   Frédéric Giroire, Dorian Mazauric, Joanna Mouliérac, and Brice Onfroy
2. Energy Efficient Client-centric Shaping of Multi-flow TCP Traffic
   Ahmad Nazir Raja, Zhihua Jin, and Matti Siekkinen
3. PEARL: Power-aware, Dependable, and High-Performance Communication Link using PCI Express
   Toshihiro Hanawa, Taisuke Boku, Shin’ichi Miura, Mitsuhisa Sato, and Kazutami Arimoto
4. Cost-effective Routing for a Greener Internet
   Bernd Bergler, Christopher Preschern, Andreas Reiter, and Stefan Kraxberger

GreenCom 12 Cluster Computing II
Session Chair: Rong Ge
1. Multi-tier Energy Management Strategy for HPC Clusters
   Yusong Tan, Qingbo Wu, and Huiming Tang
2. Towards Adaptive Power-Aware Scheduling for Real-Time Tasks on DVS-Enabled Heterogeneous Clusters
   Xiaomin Zhu, Chuan He, Yuping Bi, and Dishan Qiu
3. Snooze: A Scalable, Fault-Tolerant and Distributed Consolidation Manager for Large-Scale Clusters
   Eugen Feller, Louis Rilling, Christine Morin, Renaud Lottiaux, and Daniel Leprince
The EaCN 2010 Technical Program

Saturday, December 18, 2010

08:00-08:20 Opening Ceremony
08:20-09:10 GreenCom keynote: Mohammad S. Obaidat (Chair: Honggang Zhang)
09:10-10:00 GreenCom keynote: George L.-T. Chiu (Chair: Wu-chun Feng)
10:00-10:20 Coffee Break
12:00-13:30 Lunch
13:30-15:10 EaCN 1
15:10-15:30 Coffee Break
15:30-16:45 EaCN 2
16:45-18:00 EaCN 3

EaCN 1: Wireless Sensor Networks
Session Chair: Shijian Li
1. A New Polling Protocol with Efficient Cluster Creation for WSN
   Min Seok Choi, Wang Yaqiong, Kyung Tae Kim, Suk Jung Yong, and Hee Yong Youn
2. Effect of Utility Function on Lifetime of Directional Sensor Networks
   Mandana Norouzi, Mojtaba Hoseini, Chi Zhou, and Yanliang Jin
3. Improved Cluster Heads Selection Method in Wireless Sensor Networks
   Yaqiong Wang, Qi Wang, Ziyu Jin, and Navrati Saxena
4. An Efficient Network Configuration Method of Mobile Nodes on Energy-Balanced Sensor Networks
   Jae-Hyung Lee, Eung-Soo Lee, and Dong-Sung Kim
   Sanjay K. Dhurandher, Mohammad S. Obaidat, Gaurav Jain, Isha Mani Ganesh, and Vinay Shashidhar

EaCN 2: Parallel and Distributed Computing
Session Chair: Dong-Sung Kim
1. Towards Green P2P: Understanding the Energy Consumption in P2P Under Content Pollution
   Peiqing Zhang and Bjarne E. Helvik
2. A New Power-Aware Scheduling Algorithm for Distributed System
   Xin Chen, Qiang Liu, and JianBing Lai
   Guibin Wang, YiSong Lin, and Wei Yi
4. Low Power Design for a Multi-core Multi-thread Microprocessor
   Yong-Wen Wang, Qian-Bing Zheng, Qiang Dou, and Min-Xuan Zhang

EaCN 3: Cloud Computing and Virtualization
Session Chair: Congfeng Jiang
1. Power Aware Resource Allocation in Virtualized Environments through VM Behavior Identification
   Congfeng Jiang, Jilin Zhang, Jian Wan, Xianghau Xu, Yuyu Yin, Ritai Yu, and Changping Lv
2. Power Control by Distribution Tree with Classified Power Capping in Cloud Computing
   Zhengkai Wu and Jun Wang
   Simon Kiertscher, Jörg Zinke, Stefan Gasterstädt, and Bettina Schnor
EaCN 4: Computer Architecture I
Session Chair: Jun Wang

1. A Green Computing Based Architecture Comparison and Analysis
   Benjamin Zhong Ming Feng and Chung-Horng Lung

2. Temperature-Power Consumption Relationship and Hot-Spot Migration for FPGA-Based System
   Xun Zhang, Wassim Jouini, Pierre Leray, and Jacques Palicot

   Maryline Chetto and Hui Zhang
### Monday, December 20, 2010

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<td>10:20-11:10</td>
<td>GreenCom keynote: Luoning Gui (Chair: Feng Xia)</td>
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#### EaCN 5: Embedded and Ubiquitous Computing  
**Session Chair:** Yukihiro Nakagawa  
   Bin Yu, Le Wang, and Jukka Manner  
2. Energy Consumption in Downlink MIMO Relay Systems with Multiple Users  
   Jie Xu and Ling Qiu  
3. An Embedded Software Power Model Based on Algorithm Complexity Using Back-Propagation Neural Networks  
   Qi Li, Bing Guo, Yan Shen, JiHe Wang, YuanSheng Wu, and Yunben Liu  
4. Area Power Consumption in a Single Cell Assisted by Relays  
   Jie Xu and Ling Qiu  

#### EaCN 6: Computer Networks  
**Session Chair:** Le Wang  
1. Power-Aware TCAMs for Routing Table Lookup  
   Weidong Wu, Dezhi Ji, Yu Lan, and Tong Wu  
2. Toward the Green Video CDN  
   Ning Xu, Jin Yang, Mike Needham, Dragan Boscovic, and Faramak Vakil  
3. Energy-efficient Routing in User-centric Environments  
   Antonio Júnior and Rute Sofia  

#### EaCN 7: Computer Architecture II  
**Session Chair:** Antonio Junior  
   Yukihiro Nakagawa, Takeshi Shimizu, Yoichi Koyanagi, Osamu Shiraki, Shinji Kobayashi, Kazuki Hyoudou, Takashi Miyoshi, Yuuki Ogata, Yasushi Umezawa, Takeshi Horie, and Akira Hattori  
2. Dynamic File System Migration for Energy Efficient Storage Management  
   Inuk You and Youjip Won  
3. Non-Instruction Fetch-Based Architecture Reduces Almost 100% of the Dynamic Power and Energy  
   Abdelghani Renbi, Lennart Lindh, and Jerker Delsing
# The IOTS 2010 Technical Program

## Saturday, December 18, 2010

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### IOTS 1: Network Architectures and Routing
**Session Chair:** Sarfraz Alam

1. **XPlaces: An Open Framework to Support the Digital Living at Home**
   Massimo Deriu, Gavino Paddeu, and Alessandro Soro
2. **A Semantic Enhanced Service Proxy Framework for Internet of Things**
   Sarfraz Alam and Josef Noll
3. **A Cognitive QoS Method Based on Parameter Sensitivity**
   Zhikui Chen, Feng Han, and Yang Liu
4. **Peer-to-Peer Framework for RFID/Non-RFID Reader-Enabled Users**
   Oscar Botero and Hakima Chaouchi

### IOTS 2: Emerging Applications I
**Session Chair:** Feng Xia

1. **An Adaptive Indoor Location Detection Method Using Hybrid of Radio Signal and Image Sensors**
   Wei Zhou, Xiaojun Ma, and Jun Li
2. **Tracking and Identification of Animals for a Digital Zoo**
   Johannes Karlsson, Keni Ren, and Haibo Li
3. **A High-Confidence Cyber-Physical Alarm System: Design and Implementation**
   Longhua Ma, Tengkai Yuan, Feng Xia, Ming Xu, Jun Yao, and Meng Shao

### IOTS 3: Emerging Applications II
**Session Chair:** Benjamin Khoo

1. **Efficient Synchronization Method for IR-UWB 802.15.4a non-coherent Energy Detection Receiver**
   Dan Kreiser and Sonom Olonbayar
2. **Research on Locating and Tracking Automotive Products in Workshop Based on Active RFID Technology**
   Zhiyong Luo, Chaoyang Xing, Heng Wang, and Ping Wang
3. **RFID- from Tracking to the Internet of Things: A Review of Developments**
   Benjamin Khoo
4. **An Intelligent RFID System for Consumer Businesses**
   Subbu Somasundaram, Pawan Khandavilli, and Srinivas Sampalli
Sunday, December 19, 2010

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IOTS 4: Communications, Security and Trust  
Session Chair: Yang Liu

   Yun Wang, Peizhong Shi, Kai Li, and Zhikui Chen
   Feng Wang, Jiayu Zhu, and Meng Shen
3. Tolerance-Based Adaptive Online Outlier Detection for Internet of Things  
   Qiang Shen, Zhijun Zhao, Wenjia Niu, Yu Liu, and Hui Tang
4. How Key Establishment in Medical Sensor Networks Benefits from Near Field Communication Technology  
   Oliver Maye and Steffen Pete
5. A Trust Model Based on Service Classification in Mobile Services  
   Yang Liu, Zhikui Chen, Feng Xia, Xiaoning Lv, and Fanyu Bu
The GCCN 2010 Technical Program

Monday, December 20, 2010

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GCCN: Green Communication of Cellular Networks

Session Chair: Xiaohu Ge

1. A Serial MIS Based CDS Constructing Algorithm for Wireless Networks
   Yuming Wang and Dasheng Zhao
2. An Energy Efficient WLAN Skype Deployment Using GSM Wakeup Signals
   Lifu Wang, Dasheng Zhao, and Lei Ming
3. Energy Savings Modeling and Performance Analysis in Multi-Power-State Base Station Systems
   Iztok Humar, Jing Zhang, Zeshi Wu, and Lin Xiang
4. A Frame Traffic Control Algorithm for IEEE802.11 WLAN
   Chuang Liu, Xiaohu Ge, Lin Xiang, Chengqian Cao, and Ke Zhang
CPSC 2010 Organizing and Program Committees

General Chairs
Bebo White, SLAC National Accelerator Laboratory, Stanford University, USA
Feiyue Wang, Chinese Academy of Science, China
Huan Liu, Arizona State University, USA

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Alvin Chin, Nokia Research Center, China

Workshop Chairs
Bofeng Zhang, Shanghai University, China
Qian Mo, Beijing Gongshang University, China
Feng Xia, Dalian University of Technology, China

Panel Chairs
Xiaofeng Yu, Zhejiang University, China
Xueqi Cheng, Chinese Academy of Science, China

Publicity Chairs
Qianbing Zheng, National University of Defense Technology, China
Jie Wen, Huazhong University of Science and Technology, China

Web and System Chair
Shizheng Jiang, St Francis Xavier University, Canada

Award Chairs
Furong Wang, Huazhong University of Science and Technology, China

Financial Chair
Ling Chen, Zhejiang University, China

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Weijia Jia, City University of Hong Kong, China
Jiannong Cao, Hongkong Polytechnic University, China
Runhe Huang, Hosei University, Japan

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Jiang Xu, Hong Kong University of Science and Technology, Hong Kong, China
Guoqing Yang, Zhejiang University, China
K K David Young, Hong Kong University of Science and Technology, Hong Kong, China
Keynote: Managing Granular Information in the Design and Analysis of Human-Centric Fuzzy Systems for Social Computing

Witold Pedrycz, University of Alberta, Canada

Summary:

Human centricity contributes to the fabric of social computing. Information granularity arises as a fundamental concept facilitating human-system interaction and collaboration among subsystems forming an overall topology of socially oriented systems.

In this talk, we elaborate on the fundamentals of information granularity and introduce a concept of collaborative granular computing. In social computing, we are faced with a number of separate streams of information granules generated by individual sources (users, models) and the resulting individual sources of knowledge formed on their basis. An ultimate objective is to realize an effective interaction at the global basis by invoking some mechanisms of knowledge sharing and collaboration. In this way, each source of knowledge is developed not only by relying on some experimental evidence that becomes locally available but it is exposed to some general conceptual perspective by effectively communicating with other entities and sharing and reconciling revealed local sources of knowledge.

Several fundamental modes of collaboration (which vary with respect to the assumed levels of interaction) are investigated along with the concepts of collaboration mechanisms subsequently leading to the effective way of knowledge sharing and reconciling or calibrating the individual perspectives (points of view).

For illustrative purposes, the underlying architecture investigated in this talk is concerned with rule-based topologies with $R_i$ being a certain information granule (for instance, fuzzy set) formed in the input space and $f_i$ denoting any local model realizing a certain mapping confined to the local region of the input space and specified by $R_i$.

It is also shown that the collaboration and reconciliation of locally available pieces of knowledge ultimately give rise to the concept of higher type information granules, especially fuzzy sets of type-2 and interval-valued fuzzy sets. With this regard, it is shown that the principle of justifiable granularity offers a constructive way of forming type-2 fuzzy sets.
Keynote: From Computational Experimentation to Social and Economic Computing

Fei-Yue Wang, Chinese Academy of Science, China

About the keynote speaker

Fei-Yue Wang received his Ph.D. in Computer and Systems Engineering, minor in Computer Science, from the Rensselaer Polytechnic Institute (RPI), Troy, New York, USA, in 1990. He joined the University of Arizona in 1990 and is the Professor of Systems and Industrial Engineering and Director of the Program for Advanced Research in Complex Systems. In 1998, he founded the Intelligent Control and Systems Engineering Center at the Institute of Automation, Chinese Academy of Sciences, Beijing, China. Since 2002, he has been the Director of the Key Laboratory of Complex Systems and Intelligence Science at the Chinese Academy of Sciences. His current research interests include intelligent control systems; social computing; modeling, analysis, and control mechanism of complex systems. He has published more than 200 books, book chapters, and papers in those areas since 1984 and received research funding from NSF, DOE, DOT, NNSF, CAS, MOST, Caterpillar, IBM, HP, AT&T, GM, BHP, RVSI, ABB, and Kelon. He is an elected Fellow of the Institute of Electrical and Electronics Engineers (IEEE), International Council of Systems Engineering (INCOSE), International Federation of Automatic Control (IFAC) and the American Association for the Advancement of Science (AAAS).

Summary:

Computational modeling based on heterogeneous individual behavior and complex interactions among individuals or actors is playing an increasingly important role in management sciences and social sciences. In the past, theory building in these disciplines has been largely independent of micro-level observations due to the data availability challenge. As the Web and mobile technologies have been rapidly adopted in all walks of life, rich sets of data are becoming increasingly available at low costs in unprecedentedly detailed level of granularity and resolution. Yesterday's black-boxes are becoming today's white-boxes. Economic and social theories that used to rely primarily on hypotheses such as "invisible hands" are now being re-examined with data and observations, just like their counterparts in natural sciences. In this transition of historic proportion, economic and social computing research is emerging and has drawn attention from multiple research fields. In this talk, we discuss economic and social computing from two perspectives: economic and social computing as a new methodological framework for management and social science research, economic and social computing as a new phenomenon warranting multidisciplinary investigations.
**Keynote: Advances in Evolutionary Multi-objective Optimization**

Kay Chen Tan, National University of Singapore, Singapore

**About the keynote speaker**

Associate Professor Kay Chen Tan received the B. Eng degree with First Class Honors in Electronics and Electrical Engineering, and the Ph.D. degree from the University of Glasgow, Scotland, in 1994 and 1997, respectively. He is actively pursuing research in computational and artificial intelligence, with applications to multi-objective optimization, scheduling, automation, data mining, and games.

Dr Tan has published over 90 journal papers, over 100 papers in conference proceedings, co-authored 5 books including Multiobjective Evolutionary Algorithms and Applications (Springer-Verlag, 2005), Modern Industrial Automation Software Design (John Wiley, 2006; Chinese Edition, 2008), Evolutionary Robotics: From Algorithms to Implementations (World Scientific, 2006; Review), Neural Networks: Computational Models and Applications (Springer-Verlag, 2007), and Evolutionary Multi-objective Optimization in Uncertain Environments: Issues and Algorithms (Springer-Verlag, 2009), co-edited 4 books including Recent Advances in Simulated Evolution and Learning (World Scientific, 2004), Evolutionary Scheduling (Springer-Verlag, 2007), Multiobjective Memetic Algorithms (Springer-Verlag, 2009), and Design and Control of Intelligent Robotic Systems (Springer-Verlag, 2009).

Dr Tan has been invited as a keynote/invited speaker for over 15 international conferences. He served in the international program committee for over 100 conferences and involved in the organizing committee for over 20 international conferences, including the General Chair for IEEE Congress on Evolutionary Computation 2007 in Singapore and the General Chair for IEEE Symposium on Computational Intelligence in Scheduling 2009 in Tennessee, USA. Dr Tan is currently a member of Evolutionary Computation Technical Committee in the IEEE Computational Intelligence Society. Dr Tan is currently the Editor-in-Chief of IEEE Computational Intelligence Magazine (CIM). He also serves as an Associate Editor / Editorial Board member of 15 international journals, such as IEEE Transactions on Evolutionary Computation, IEEE Transactions on Computational Intelligence and AI in Games, Evolutionary Computation (MIT Press), European Journal of Operational Research, Journal of Scheduling, and International Journal of Systems Science.

Dr Tan received the Recognition Award (2008) from the International Network for Engineering Education & Research (iNEER) for outstanding contributions to engineering education and research. He was a winner of the NUS Outstanding Educator Awards (2004), the Engineering Educator Awards (2002-2003, 2005), the Annual Teaching Excellence Awards (2002-2006), and the Honour Roll Awards (2007). He is currently a Fellow of the NUS Teaching Academic.

**Summary:**

Multi-objective evolutionary algorithms are a class of stochastic optimization techniques that simulate biological evolution to solve problems with multiple (and often conflicting) objectives. Advances made in the field of evolutionary multi-objective optimization (EMO) are the results of more than two decades worth of intense research, studying various topics that are unique to MO problems, such as fitness assignment, diversity preservation, balance between exploration and exploitation, elitism and archiving. However many of these studies assume that the problem is deterministic, while the EMO performance generally deteriorates in the presence of uncertainties. In certain situations, the solutions found may not even be implementable in practice.

In this talk, challenges faced in EMO research will be discussed and various EMO features and algorithms will be presented. Specifically, the impact of noise uncertainties on MO optimization will be described and the approaches/modifications to basic algorithmic design for robust optimization will be presented. The talk will also discuss the application of EMO techniques for solving engineering problems, such as system design and scheduling, which often involve different competing specifications in a large and highly constrained search space.
Keynote: Reliable Wireless Clinical Monitoring in General Hospital Units

Chenyang Lu, Washington University in St. Louis, USA

About the keynote speaker

Chenyang Lu is a Professor of Computer Science and Engineering at Washington University in St. Louis. Professor Lu is the author and co-author of more than 100 publications. He is associate editor of ACM Transactions on Sensor Networks, Real-Time Systems and International Journal of Sensor Networks, and Guest Editor of the Special Issue on Real-Time Wireless Sensor Networks of Real-Time Systems and the Special Section on Cyber-Physical Systems and Cooperating Objects of IEEE Transactions on Industrial Informatics. He served or is serving as Program and General Chair of IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS) in 2008 and 2009, Track Chair on Sensor Networks of IEEE Real-Time Systems Symposium (RTSS) in 2007 and 2009, Program Chair of International Conference on Principles of Distributed Systems (OPODIS) in 2010, Vice Chair on Sensor Networks and Ubiquitous Computing of International Conference on Distributed Computing (ICDCS) in 2011, and Program Chair of International Conference on Body Area Networks (BodyNets) in 2011. Professor Lu is a member of the Executive Committee of IEEE Technical Committee on Real-Time Systems. He was a recipient of the NSF CAREER Award in 2005. Professor Lu received the Ph.D. degree in computer science from University of Virginia in 2001. His research interests include real-time embedded systems, wireless sensor networks, and cyber-physical systems.

Summary:

Wireless sensor networks fill the need for real-time clinical monitoring in general hospital units where clinical deterioration in patients is a major concern. We developed a wireless clinical monitoring system for collecting pulse and oxygen saturation readings from patients. The system has recently been deployed for a clinical trial in a step-down cardiac care unit at Barnes-Jewish Hospital, St. Louis. Over the seven-month deployment involving 46 patients, the system achieved a median network reliability of 99.68%. The overall reliability of the system was dominated by sensing reliability of the pulse oximeters. Sensing failures usually occurred in short bursts, although longer periods were also present due to sensor disconnections. We show that the sensing reliability could be significantly improved through oversampling and by implementing a disconnection alarm system that incurs moderate intervention cost. A retrospective data analysis indicated that the system provided sufficient temporal resolution to support the detection of clinical deterioration. This clinical trial demonstrated the feasibility and promise of wireless sensor network technology for clinical monitoring in general hospital units. This pilot study is part of a larger project aimed at identifying complications early in hospitalized patients using multi-modality methods/technologies. I will also give an overview of other on-going research on cyber-physical systems on civil structural health monitoring and real-time wireless sensor-actuator networks.
The 4th Asia-Pacific Embedded Systems Education and Research Conference (APESER 2010)


Shangping Ren, Illinois Institute of Technology, USA

About the keynote speaker

Dr. Shangping Ren is an Associate Professor in the Department of Computer Science at Illinois Institute of Technology (IIT). She obtained her doctoral degree in Computer Science from University of Illinois at Urbana-Champaign (UIUC) in 1997. Before she joined IIT in 2003, she worked in software industry as a lead software engineer for over 5 years. She has won the United States National Science Foundation CAREER award, IIT Sigma Xi Research award, and has obtained over $1m research grants from the United States National Science Foundation. Her research areas include cyber-physical systems, real-time distributed systems, software engineering, programming languages, and formal methods.

Summary:

A cyber-physical system (CPS) features a tight combination of, and sophisticated interaction and coordination between physical and computational resources. It often consists of a large number of sensing and actuation devices that share information communication networks. There exists a class of CPS applications, such as water/gas distribution networks, power grid transmission networks, and ground/air traffic networks, which in essence are loosely coupled networked control systems where connections among individual components, or subsystems, are sometimes uncontrollable. Understanding this type of control systems and being able to address the scientific and technological challenges that arise in their development and operation will make the CPS vision a reality and make it possible to fully exploit the great potential and impact in a number of sectors that are critical to national security and competitiveness, including civil infrastructures, transportation systems, and others. Such Cyber-Physical Systems (CPS) involve communication, computation, sensing, and actuating through heterogeneous and widely distributed physical devices and computational components. The close interactions of these systems with the physical world place events as the major building blocks for the realization of CPS. More specifically, the system components and design principles should be revisited with a strictly event-based approach.

This talk centers around two event models that we have developed. First, we will discuss a concept lattice-based event (CLE) model for CPS. Under this model, a CPS event is uniformly represented by three components: event type, its internal attributes, and its external attributes. The internal and external attributes together characterize the type, spatial-temporal properties of the event as well as the components that observe it. A set of event composition rules are defined where the CPS event composition is based on a CPS concept lattice. The resulting event model can be used both as an offline analysis tool as well as a run-time implementation model due to its distributed nature. However, in the CLE model, the traditional first order logic is used in specifying rules composition. It is possible that the rules specified by the first order logic may have inconsistency. Furthermore, unanticipated events that are not considered in the initial design may affect system performance, or even lead to system failure. To address these issues, we will also discuss an Adaptive Discrete Event (ADE) model. The ADE model uses Discrete Event Calculus (DEC) to overcome possible inherent inconsistencies in composition rules that are specified by first order logic. In addition, we define abnormal event rules as an adaptive part in the CPS event model to handle the unanticipated events.
Keynote: From Models to Efficient Real-Time Software: Automotive Systems and Beyond

Marco Di Natale, Scuola Superiore Sant'Anna, Italy

About the keynote speaker

Dr. Marco Di Natale is currently IEEE member and Associate Professor at the Scuola Superiore Sant’Anna of Pisa, Italy, in which he held a position as Director of the Real-Time Systems (ReTiS) Lab from 2003 to 2006. He received his PhD from Scuola Superiore Sant’Anna in 1991 and has been Visiting Researcher at the University of California, Berkeley in 2006 and 2008/09. He has been selected in 2006 by the Italian Ministry of Research as the national representative in the mirror group of the ARTEMIS European Union Technology platform. He's been a researcher in the area of real-time systems and embedded systems for more than 15 years, being author or co-author of more than 100 scientific papers. He has been winner of three best paper awards and the Archie T. Colwell award. Marco Di Natale has served as Program Committee member and has been organizer of tutorials and special sessions for the main conferences in the area, including the Real-time Systems Symposium, the IEEE/ACM Design Automation Conference (DAC), the Design Automation and Test in Europe (DATE) and the Real-Time Application Symposium. He also served as Track Chair for the RTAS conference, and is currently chair of the Transportation track of the DATE Conference. He has been associate editor for the IEEE Transactions on CAD and the IEEE Embedded Systems Letters and is currently in the editorial board of the IEEE Transactions on Industrial Informatics.

Summary:

Automotive systems have been on the forefront in the development of standards for real-time operating systems and in the use of model-based development of software. However, due to the limited amount of distribution and concurrency, the implications in the generation of software implementations of control functions with real-time constraints have been scantily analyzed until now.

Today, the scenario is rapidly evolving while adding further complexity, with the integration of the upcoming AUTOSAR standard for the definition of application-level components and automotive software/hardware architectures.

This talk will outline some of the challenges and possible solutions for the development of modern automotive systems in a model-based flow. Also, most of the problems related to the need of preserving model semantics while offering an efficient (real-time) software implementation are common to other domains, including aeronautics and control automation. The model-based development of complex distributed embedded systems requires a much tighter integration of competencies in controls, formal methods and software architectures and platforms, which will require substantial innovation in the education programs and immediate help from the research community.
Keynote: Modeling, Analysis and Co-Design of Cyber-Physical Systems

Samarjit Chakraborty, TU Munich, Germany

About the keynote speaker

Samarjit Chakraborty is a Professor of Electrical Engineering at TU Munich, where he heads the Institute for Real-Time Computer Systems (RCS). Prior to joining TU Munich, from 2003 – 2008 he was an Assistant Professor of Computer Science at the National University of Singapore. He obtained his Ph.D. in Electrical and Computer Engineering from ETH Zurich in 2003. His research interests cover all aspects of system-level design of real-time embedded systems and software. Some of the application domains he works on include automotive electronics and software, real-time multimedia, body-area sensor networks for health monitoring, energy-efficient smart buildings, and high-performance computing for medical imaging.

Prof. Chakraborty regularly serves on the technical program committees of several conferences in the area of real-time and embedded systems, such as DATE, CODES+ISSS, ASP-DAC, RTSS and RTAS. He has also served as the Track Chair of RTSS 2007, ASP-DAC 2009, 2010, DATE 2010, 2011, as the TPC Chair of IEEE ESTIMedia 2006, 2007, as the General Chair of IEEE ESTIMedia 2008, and as the TPC Co-Chair of EMSOFT 2009. He has recently served as the General Co-Chair of Embedded Systems Week 2010, and will serve as the General Chair of ESWeek 2011 in Taiwan.

Apart from more than 80 referred journal and conference articles, he has authored a number of patents and regularly gives invited talks and tutorials at various research labs and international conferences (such as ESWeek, VLSI Design, ACM Multimedia and ICME). For his Ph.D. thesis, he received the ETH Medal and the European Design and Automation Association’s “Outstanding Doctoral Dissertation Award” in 2004. His work has also received a HiPEAC Paper Award in 2009 and Best Paper Award nominations at DAC 2005, CODES+ISSS 2006, ECRTS 2007, CODES+ISSS 2008, and EMSOFT 2010.

Summary:

In this talk we will discuss techniques for modeling and analysis of cyber-physical systems, especially in the context of automotive architectures and software. Here, multiple control applications get mapped onto different electronic control units (ECUs) that communicate over one or more FlexRay/CAN buses. We will start with a general framework for modeling such architectures and conclude with a couple of examples illustrating the need for control/architecture co-design in order to close the semantic gap between high-level control models and distributed architectures on which they are finally implemented.
# The CPSCom 2010 Technical Program

## Saturday, December 18, 2010

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<td>08:00-18:00</td>
<td>Registration</td>
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<tr>
<td>08:00-08:20</td>
<td>Opening Ceremony</td>
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<tr>
<td>10:00-10:20</td>
<td>Coffee Break</td>
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<td>12:00-13:30</td>
<td>Lunch</td>
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<tr>
<td>13:30-15:10</td>
<td>CPSCom 1</td>
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<td>15:10-15:30</td>
<td>Coffee Break</td>
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<td>CPSCom 2</td>
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<td>16:45-18:00</td>
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## CPSCom 1: Online Social Networking

### Session Chair: Su Yang

1. Detection of Abnormal Crowd Distribution  
   Zhenmei Liao, Su Yang, and Jianning Liang
2. Activity Recognition from Call Detail Record: Relation Between Mobile Behavior Pattern and Social Attribute Using Hierarchical Conditional Random Fields  
   Chen Zhou, Zhengguang Xu, and Benxiong Huang
3. A Methodology to Predicate Human-Being’s Movement Based on Movement Group  
   Zhe Guo, Zheng Yan, and Furong Wang
4. Towards Names and Gender Behavior in Online Social Networks  
   Jianbin Hu, Cong Tang, Yong Deng, Wei Xin, Tao Yang, Zhong Chen, and Anming Xie
5. SUPE-Net: An Efficient Parallel Simulation Environment for Large-Scale Networked Social Dynamics  
   Bonan Hou, Yiping Yao, Bing Wang, and Dongsheng Liao

## CPSCom 2: Internet of Things

### Session Chair: Guowei Wu

1. Dynamic Tuning Retransmission Limit of IEEE 802.11 MAC Protocol for Networked Control Systems  
   Jia Bai, Emeka P. Eyisi, Yuan Xue, and Xenofon D. Koutsoukos
2. Optimal Congestion and Power Control Providing SINR Guarantee and Energy Saving for Ad Hoc Networks  
   Yongmin Zhang, Weiqiang Xu, Yaming Wang, and Yunhua Zhang
3. Distributed Multi-agent Reasoning with Layered Context Modeling and Priority  
   Thi Hien Pham, JunYeol Choi, HyungDo Lyu, and Hee Yong Youn

## CPSCom 3: Pervasive Computing and Ubiquitous Networking

### Session Chair: Peidong Zhu

1. Shift to Cyber-I: Reexamining Personalized Pervasive Learning  
   Neil Y. Yen, Jianhua Ma, Runhe Huang, Qun Jin, and Timothy K. Shih
2. The Multi-Modal Human Identification Based on Smartcard in Video Surveillance System  
   Hae-Min Moon, Chulho Won, and Sung Bum Pan
3. iCare: A Mobile Health Monitoring System for the Elderly  
   Ziyu Lv, Feng Xia, Guowei Wu, Lin Yao, and Zhikui Chen
Saturday, December 19, 2010

<table>
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<tr>
<td>08:20-09:10</td>
<td>CPSCCom keynote: Kay Chen Tan (Chair: Peidong Zhu)</td>
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<tr>
<td>10:00-10:20</td>
<td>Coffee Break</td>
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<tr>
<td>11:10-12:00</td>
<td>CPSCCom keynote: Feiyue Wang (Chair: Jianhua Ma)</td>
</tr>
<tr>
<td>12:00-13:30</td>
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<td>15:10-15:30</td>
<td>Coffee Break</td>
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<tr>
<td>15:30-16:45</td>
<td>CPSCCom Panel (Chair: Huan Liu)</td>
</tr>
</tbody>
</table>

**CPSCCom 4: CPS System Design**

**Session Chair: Peidong Zhu**

1. A Communication Protocol for a Vehicle Collision Warning System
   Huang Zhu and Gurdip Singh
2. A Semantic Bayesian Network for Web Mashup Network Construction
   Chunying Zhou, Huajun Chen, Zhipeng Peng, Yuan Ni, and Guotong Xie
3. Towards Our Real Life- SMMS: Semantic-Based Mobile Mashup System
   Zhipeng Peng, Huajun Chen, Ying Liu, Lei Wang, Jian Chen, and Jinghai Rao
4. Resource Selection in Large-Scale Distributed System Using Dynamic Task Sharing
   Dae Gun Kim, Zhong Yuan Li, Sung Soo Moon, and Hee Yong Youn

**CPSCCom 2010 Panel**

Title: Research Directions and Opportunities in Cyber, Physical, and Social Computing

Panelists:

Huan Liu (Chair), Arizona State University, USA
Feiyue Wang, Chinese Academy of Sciences, China
Jianhua Ma, Hosei University, Japan
Chenyang Lu, Washington University in St. Louis, USA
Marco Di Natale, Scuola Superiore Sant'Anna, Italy
Samarjit Chakraborty, TU Munich, Germany
Sun-Ki Chai, University of Hawaii, USA
Shyue-Liang Wang, National University of Kaohsiung, Taiwan
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<td>CPSCom keynote: Witold Pedrycz (Chair: Sun-Ki Chai)</td>
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**CPSCom 5: CPS Security and Privacy I**  
**Session Chair:** Nenggan Zheng  
1. A Study on Secure RFID Mutual Authentication Scheme  
   Guorui Li and Ying Wang  
2. Inference Attacks with Reverse Lookup in Online Social Networks  
   Cong Tang, Yonggang Wang, Hu Xiong, Jianbin Hu, Zhong Chen, Anming Xie, Yongqiang Xie, and Zhaojun Wang  
3. A Clustering-Based Location Privacy Protection Scheme for Pervasive Computing  
   Lin Yao, Chi Lin, Xiangwei Kong, Feng Xia, and Guowei Wu  
4. Effectiveness of Physical, Social and Digital Mechanisms against Laptop Theft in Open Organizations  
   Trajce Dimkov, Wolter Pieters, and Pieter Hartel

**CPSCom 6: CPS Computing Model**  
**Session Chair:** Bing Wang  
1. EPSP: Enhancing Network Protocol with Social-Aware Plane  
   Qianbing Zheng, Peidong Zhu, Yongwen Wang, and Ming Xu  
2. Context Modeling Reflecting the Perspectives of Constituent Agents in Distributed Reasoning  
   Seong Woo Lee, Chang Hoon Lyu, Kyu Sung Ahn, Seung Wok Han, and Hee Yong Youn  
3. Connecting Technical and Non-technical Views of System Architectures  
   Li Li, Jozef Hooman, and Jeroen Voeten

**CPSCom 7: CPS Security and Privacy II**  
**Session Chair:** Li Li  
1. Security Issues and Challenges for Cyber Physical System  
   Eric Ke Wang, Yunming Ye, Xiaofei Xu, S. M. Yiu, L. C. K. Hui, and K. P. Chow  
2. Benefits of Location-Based Access Control: A Literature Study  
   André van Cleef, Wolter Pieters, and Roel Wieringa  
   Yanzhe Che, Qiang Yang, Chunming Wu, and Lianhang Ma
# The WiSARN-Fall 2010 Technical Program

## Monday, December 20, 2010

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<td>16:45-18:00</td>
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### WiSARN 1: WiSARN I
**Session Chair: Xu Li**

1. Ring-Walk Based Channel-Hopping Algorithms with Guaranteed Rendezvous for Cognitive Radio Networks  
   Hai Liu, Zhiyong Lin, Xiaowen Chu, and Yiu-Wing Leung
   Yasir Faheem and Saadi Boudjit
3. Path Planning with Obstacle Avoidance in PEGs: Ant Colony Optimization Method  
   Rong Du, Xiaobin Zhang, Cailian Chen, and Xinping Guan

### WiSARN 2: WiSARN II
**Session Chair: Xu Li**

   Lihui Tu, Huanjie Hong, and Gang Zhou
2. A Comprehensive Review of Sensor Relocation  
   Wei Shi and Jean-Pierre Corriveau
## The SocialNet 2010 Technical Program

### Monday, December 20, 2010

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### SocialNet 1: Social Networking Model
**Session Chair: Shyue-Liang Wang**

1. Re-Socializing Online Social Networks  
   Michael Dürr, Martin Werner, and Marco Maier
2. Evaluating Node Importance with Multi-Criteria  
   Jun Hu, Bing Wang, and Deyi Lee
3. Users’ Expectations on Restructuring OPACs through Social Network Applications  
   Nevzat Özel and Tolga Çakmak
4. Social Networks: Challenges and New Opportunities  
   Kanna Al Falahi, Yacine Atif, and Said Elnaffar

### SocialNet 2: Social Networking Analysis and Applications
**Session Chair: Kanna Al Falahi**

1. Anonymizing Set-Valued Social Data  
   Shyue-Liang Wang, Yu-Chuan Tsai, Hung-Yu Kao, and Tzung-Pei Hong
2. Human Contact Prediction Using Contact Graph Inference  
   Kazem Jahanbakhsh, Gholamali C. Shoja, and Valerie King
3. Social Networks Perspective of Firefighters’ Adaptive Behaviour and Coordination among Them  
   Alireza Abbasi, Liaquat Hossain, Jafar Hamra, and Christine Owen
4. Knowledge Aggregation in Human Flesh Search  
   Bing Wang, Yiping Yao, Bonan Hou, Dongsheng Liao, and Dan Chen
5. Potential Friend Recommendation in Online Social Network  
   Xing Xie
The UUMA 2010 Technical Program

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### UUMA: Universal User Modeling and Applications

**Session Chair: Wenhao Zhu**

1. **Game System of Treadmill Based on Video Capture**  
   Hai Hu, Yi Cui, and Benxiong Huang
2. **Social Services Computing: Concepts, Research Challenges, and Directions**  
   Suke Li and Zhong Chen
3. **A Hybrid Movie Recommender Based on Ontology and Neural Networks**  
   Yong Deng, Zhonghai Wu, Cong Tang, Huayou Si, Hu Xiong, and Zhong Chen
4. **Search Results Clustering Based on Suffix Array and VSM**  
   Shunlai Bai, Wenhao Zhu, Bofeng Zhang, and Jianhua Ma
### The APESER 2010 Technical Program

#### Saturday, December 18, 2010

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<td>APESER keynote: Marco Di Natale (Chair: Ian McLoughlin)</td>
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<td>11:10-12:00</td>
<td>APESER keynote: Shangping Ren (Chair: Ian McLoughlin)</td>
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<tr>
<td>16:45-18:00</td>
<td>APESER 3</td>
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#### APESER 1: Embedded System Education
**Session Chair: Yifan Wu**

1. To Explore Embedded System Education for Developing Local Economy  
   Shoudong Shi, Rangding Wang, and Jiangbo Qian
2. Construction of Mobile Internet Courses  
   Man Cao, Baixing Quan, Tianzhou Chen, and Xueqing Lou
3. A Perspective on the Experiential Learning of Computer Architecture  
   Ian McLoughlin and Koji Nakano
4. Resource Sharing Cloud for University Clusters  
   Padmaveni and Roberts Masillamani

#### APESER 2: Embedded Control Systems
**Session Chair: Jing Chen**

1. Developing a Toolset Supporting the Construction of Reusable Components for Embedded Control Systems  
   Wei Guan, Krzysztof Sierszecki, and Christo Angelov
2. Development of High Density Infrared Remote Control Test Matching System  
   Jianping Cai and Zhike Han
3. On the Toyota's Throttle Control Problem  
   Jim Ras and Albert M. K. Cheng
4. An Automatic Control System for Ratbot Navigation  
   Yanming Zhang, Chao Sun, Nenggan Zheng, Shaomin Zhang, Jiyan Lin, Weidong Chen, and Xiaoxiang Zheng

#### APESER 3: Embedded System Design and Development
**Session Chair: Ian McLoughlin**

1. Designing and Implementing of Earliest Deadline First Scheduling Algorithm on Standard Linux  
   Channamallikarjuna Mattihalli
2. An Implementation of a Vehicular Digital Video Recorder System  
   Chien-Chuan Lin and Ming-Shi Wang
3. Implementation of an Android Phone Based Video Streamer  
   N. Vun and Y.H. Ooi
4. Building a Software Development Environment for Embedded Systems  
   Yu Guo, Wei Guan, Krzysztof Sierszecki, and Christo Angelov
### Sunday, December 19, 2010

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<td>APESER keynote: Chenyang Lu (Chair: Shuiguang Deng)</td>
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<td>19:00-21:00</td>
<td>Banquet Dinner</td>
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### APESER 4: Embedded Applications  
**Session Chair: Zhigang Gao**

1. The Effect of Advanced Material on Multi-chip Module Electrical Properties  
   Assia A. Hanzaz
2. Polyhedral Model Based Data Locality Optimization for Embedded Applications  
   Yuan Xinyu and Li Ying
3. Scheduling Optimization Techniques for FlexRay Using Constraint-Programming  
   Zheng Sun, Hong Li, Min Yao, and Nan Li
4. Zinix - A Function-Modularized Kernel for Multiprocessor Embedded Systems  
   Jing Chen, Lian-Jou Tsai, Wen-Bin Hung, and Jian-Hong Liu
5. Queue Management in Mobile Adhoc Networks (Manets)  
   K. Dinesh Kumar, I. Ramya, and M. Roberts Masillamani

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### Monday, December 20, 2010

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<td>Lunch</td>
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Registration Desk

The Registration Desk will be open to assist you at the following times:

- Friday, Dec 17, 2010, 5.00pm – 8.00pm
- Saturday, Dec 18, 2010, 8:00am – 6:00pm
- Sunday, Dec 19, 2010, 8:00am – 8:20am
- Monday, Dec 20, 2010, 8:00am – 8:20am

Conference Banquet Dinner

The banquet is to be held on Dec 19, 2010 in Weiahuang Restaurant of Zhi Wei Gua (知味观味庄 杨公堤店) whose web site is: http://www.zhiweiguan.com.cn/Brand-Shanghai.asp?reqSort_id=46. The location can be found from the following figure:
Name Badges and Tickets

All delegates, sponsors and speakers of CPSCom/GreenCom 2010 and associated workshops and receipts will be provided with a name badge, to be collected upon registration. This badge must be worn at all times as it is your official pass to all sessions of the conferences, welcome reception, lunches, morning and afternoon teas. If you have indicated on your registration form that you will be attending the Conference Banquet, these tickets will also be issued to you with your name badge.

Presentation Information

Language
The presentation language of CPSCom/GreenCom 2010 and associated workshops is English.

Checking In
Session Chairs are requested to register at least 2 hours before their session, or as soon as the Registration Desk is open.

Setting Up
You are required to arrive at the room (in which you will deliver your talk) **15 minutes before the commencement of the session.** Upon arrival please confirm your attendance with the Session Chair and familiarize yourself with the venue.

Please bring with you a single paragraph summary, including your name (as you would like to be introduced), affiliation and research interests (maximum 100 words). Please present this to the session Session Chair upon arrival, for use for introductory purposes, prior to your talk.

Upon arrival, please copy your slides file to the presentation computer. If you plan to use your own equipment, please ensure it is ready to go prior to the session commencing, since there is very little time between presentations. If you have requested optional equipment, ensure that is in the room. In the larger conference rooms please, make sure you familiarise yourself with the audio system. For all assistance, please speak to the Session Chair.

Timing
Please ensure your check the program for the exact time of your session and where your paper falls within the session.

It is recommended that all CPSCom/GreenCom 2010 paper presentations use 25 minutes presentation time including 5 minutes question time. However, the Session Chairs will determine the exact presentation time for each paper, based on the number of presentations in each session. The Session Chairs will ensure that you do not over-run the time allocated.

**Please keep strictly to this time guideline.**
Location of CPSCom/GreenCom 2010 Conference Venue

No. 39 Causeway Yang
Hangzhou, China, 310007
Web site: http://www.jinxihotel.com/
Travel Guide to Jinxi Hotel (Conference Venue)

Via Hangzhou Xiaoshan International Airport (HGH)

If you fly from abroad to Hangzhou XiaoShan Airport, you can take a taxi to the hotel. The fare is around RMB130. You can also choose to take the airport shuttle bus to downtown. (one in every half an hour from 5:45am to 8:00pm, the fare is about RMB15). Then you can take a taxi to the hotel directly.

Via Shanghai Pudong International Airport (PVG)

Shuttle bus
From Pudong Airport to Hangzhou (direct and about 3 hours) and the fare is RMB100. Just out of the No.15 exit and cross the street and get upstairs, you will find the ticket office. The schedule for the shuttle from Pudong International Airport to Hangzhou: 8:40am; 9:30am; 10:30am; 12:00am; 13:00pm; 14:00 pm; 15:30pm; 16:30pm; 17:30pm; 18:30pm; 19:00pm; 20:00pm. Once you arrive in Hangzhou, you can take a taxi to Hangzhou Jinxi Hotel. The schedule for the shuttle from Hangzhou Huanglong Stadium back to Shanghai Pudong International Airport: 7:00am; 8:30am, 10:30am; 12:30am; 13:30pm; 14:30pm; 16:00pm.

Train
In case you want to experience the high-speed trains, first, you need to take a taxi from airport to Shanghai South Railway Station. Then, the train journey from Shanghai South railway Station to Hangzhou Station (or Hangzhou East Station) is about two hours depending on which one you catch (We suggest you to take CRH train). There are two classes of tickets available: soft seats, and hard seats. Soft seats are very comfortable. Hard seats are the lowest class of them all, but also the cheapest. Both stations have special booths for foreigners. There you don't have to wait as long as at the regular booths, but prices are more expensive. One you arrive Hangzhou Station (or Hangzhou East Station), you can take a taxi to hotel directly.
Conference Venue Jinxi Hotel Floor Plan