

# 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 Committee on Scalable Computing



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## CPSCom/GreenCom 2010 Program Overview

<b>Saturday, December 18, 2010</b>						
	Meeting Room 1	Meeting Room 2	Meeting Room 3	VIP Room	Conference Center 1	Conference Center 2
08:00-06:00	Registration					
08:00-08:20	Opening Ceremony					
08:20-9:10	GreenCom keynote: Mohammad S. Obaidat					
9:10-10:00	GreenCom keynote: George L.-T. Chiu					
10:00-10:20	Coffee Break					
10:20-11:10	APESER keynote: Marco Di Natale					
11:10-12:00	APESER keynote: Shangping Ren					
12:00-13:30	Lunch (Jinxi Hotel)					
13:30-15:10	CPSCom1	EaCN 1	APESER 1	IOT 1	GreenCom 1	GreenCom 2
15:10-15:30	Coffer Break					
15:30-16:45	CPSCom 2	EaCN 2	APESER 2	IOT 2	GreenCom 3	GreenCom 4
16:45-18:00	CPSCom 3	EaCN 3	APESER 3	IOT 3	GreenCom 5	GreenCom 6
19:00-20:30	Reception Dinner (Jinxi Hotel)					

<b>Sunday, December 19, 2010</b>						
	Meeting Room 1	Meeting Room 2	Meeting Room 3	VIP Room	Conference Center 1	Conference Center 2
08:00-08:20	Registration					
08:20-09:10	CPSCom keynote: Kay Chen Tan					
09:10-10:00	IOTS keynote: Huadong Ma					
10:00-10:20	Coffee Break					
10:20-11:10	APESER keynote: Chenyang Lu					
11:10-12:00	CPSCom keynote: Feiyue Wang					
12:00-13:30	Lunch (Jinxi Hotel)					
13:30-15:10	CPSCom 4	EaCN 4	APESER 4	IOT 4	Forum/Steering Committee Meeting	
15:10-15:30	Coffer Break					
15:30-16:45	Panel1 (Research Directions and Opportunities in Cyber, Physical, and Social Computing)					
16:45-18:00	Panel 2 (Current Trends in Low Power Computing and Commnication Systems)					
19:00-21:00	Banquet Dinner (Weizhuang Restaurant of Zhi Wei Guan)					

## Monday, December 20, 2010

	Meeting Room 1	Meeting Room 2	Meeting Room 3	VIP Room	Conference Center 1	Conference Center 2
08:00-08:20	Registration					
08:20-09:10	CPSCom keynote: Witold Pedrycz					
09:10-10:00	GreenCom keynote: Hai Jin					
10:00-10:20	Coffee Break					
10:20-11:10	GreenCom keynote: Luoning Gui					
11:10-12:00	APESER keynote: Samarjit Chakraborty					
12:00-13:30	Lunch (Jinxi Hotel)					
13:30-15:10	CPSCom 5	EaCN 6	GCCN	UUMA	GreenCom 7	GreenCom 8
15:10-15:30	Coffer Break					
15:30-16:45	CPSCom 6	EaCN 7	SocialNet 1	WiSARN 1	GreenCom 9	GreenCom 10
16:45-18:00	CPSCom 7	EaCN 8	SocialNet 2	WiSARN 2	GreenCom11	GreenCom 12

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## The 2010 IEEE/ACM International Conference on Green Computing and Communications (GreenCom2010)

### *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/ scientist. 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 Wiley & Sons (2003). Obaidat is the editor of the book, *APPLIED SYSTEM SIMULATION: Methodologies and Applications*, published by Kluwer (now Springer) in 2003.

Professor Obaidat has served as a consultant for several corporations and organizations worldwide. Mohammad is the Editor-in-Chief of the *International Journal of Communication Systems* published by John Wiley. He served as an Editor of *IEEE Wireless Communications* from 2007-2010. Between 1991-2006, he served as a Technical Editor and an Area Editor of *Simulation: Transactions of the Society for Modeling and Simulations (SCS) International, TSCS*. He also served on the Editorial Advisory Board of *Simulation*. He is now an editor of the *Wiley Security and Communication Networks Journal*, *Journal of Networks*, *International Journal of Information Technology, Communications and Convergence*, *IJITCC*, *Inderscience*. He served on the International Advisory Board of the *International Journal of Wireless Networks and Broadband Technologies*, *IGI-global*. Prof. Obaidat is an associate editor/ editorial board member of seven other refereed scholarly journals including two *IEEE Transactions*, *Elsevier Computer Communications Journal*, *Kluwer Journal of Supercomputing*, *SCS Journal of Defense Modeling and Simulation*, *Elsevier Journal of Computers and EE*, *International Journal of Communication Networks and Distributed Systems*, *The Academy Journal of Communications*, *International Journal of BioSciences and Technology* and *International Journal of Information Technology*. He has guest edited numerous special issues of scholarly journals such as *IEEE Transactions on Systems, Man and Cybernetics*, *SMC*, *IEEE Wireless Communications*, *IEEE Systems Journal*, *SIMULATION: Transactions of SCS*, *Elsevier Computer Communications Journal*, *Journal of C & EE*, *Wiley Security and Communication Networks*, *Journal of Networks*, and *International Journal of Communication Systems*, among others. Obaidat has served as the steering committee chair, advisory Committee Chair and program chair of numerous international conferences including the *IEEE Int'l Conference on Electronics, Circuits and Systems*, *IEEE International Phoenix Conference on Computers and Communications*, *IEEE Int'l Performance, Computing and Communications Conference*, *IEEE International Conference on Computer Communications and Networks*, *SCS Summer Computer Simulation Conference*, *SCSC'97*, *SCSC98-SCSC2005*, *SCSC2006*, the *International Symposium on Performance Evaluation of Computer and Telecommunication Systems* since its inception in 1998, *International Conference on Parallel Processing*, *Honorary General Chair of the 2006 IEEE Intl. Joint Conference on E-Business and Telecommunications*, *ICETE2006*. He served as *General Co-Chair of ICETE 2007-ICETE 2010*. He has served as the *Program Chair of the International Conference on Wireless Information Networks and Systems* from 2008-Presnet. He is the *co-founder and Program Co-Chair of the International Conference on Data Communication Networking, DCNET* since its inception in 2009. Obaidat has served as the *General Chair of the 2007 IEEE International Conference on Computer Systems and Applications, AICCSA2007*, the *IEEE AICCSA 2009 Conference*. and the *2006 International Symposium on Ad hoc and Ubiquitous Computing (ISAHUC'06)*. He is the founder of the *International Symposium on Performance Evaluation of Computer and Telecommunication*

Systems, SPECTS and has served as the General Chair of SPECTS since its inception. Obaidat has received a recognition certificate from IEEE. Between 1994-1997, Obaidat has served as distinguished speaker/visitor of IEEE Computer Society. Since 1995 he has been serving as an ACM distinguished Lecturer. He is also an SCS distinguished Lecturer. Between 1996-1999, Dr. Obaidat served as an IEEE/ACM program evaluator of the Computing Sciences Accreditation Board/Commission, CSAB/CSAC. Obaidat is the founder and first Chairman of SCS Technical Chapter (Committee) on PECTS (Performance Evaluation of Computer and Telecommunication Systems). He has served as the Scientific Advisor for the World Bank/UN Digital Inclusion Workshop- The Role of Information and Communication Technology in Development. Between 1995-2002, he has served as a member of the board of directors of the Society for Computer Simulation International. Between 2002-2004, he has served as Vice President of Conferences of the Society for Modeling and Simulation International SCS. Between 2004-2006, Prof. Obaidat has served as Vice President of Membership of the Society for Modeling and Simulation International SCS. Between 2006-2009, he has served as the Senior Vice President of SCS. Currently, he is the President of SCS. One of his recent co-authored papers has received the best paper award in the IEEE AICCSA 2009 international conference. He also received the best paper award for one of his papers accepted in IEEE GLOBCOM 2009 conference. Dr. Obaidat received very recently the Society for Modeling and Simulation International (SCS) prestigious McLeod Founder's Award in recognition of his outstanding technical and professional contributions to modeling and simulation.

He has been invited to lecture and give keynote speeches worldwide. His research interests are: wireless communications and networks, telecommunications and Networking systems, security of network, information and computer systems, security of e-based systems, performance evaluation of computer systems, algorithms and networks, high performance and parallel computing/computers, applied neural networks and pattern recognition, adaptive learning and speech processing. Recently, Prof. Obaidat has been awarded a Nokia Research Fellowship and the distinguished Fulbright Scholar Award. During the 2004/2005, he was on sabbatical leave as Fulbright Distinguished Professor and Advisor to the President of Philadelphia University in Jordan, Dr. Adnan Badran. The latter became the Prime Minister of Jordan in April 2005 and served earlier as Vice President of UNESCO. Prof. Obaidat is a Fellow of the Society for Modeling and Simulation International SCS, and a Fellow of the Institute of Electrical and Electronics Engineers (IEEE).

## Summary:

Among the trends in ICT is virtualization in order to find ways to reduce the amount of dedicated resources needed for an individual computer user. The non-stop increase in data generation will require us to have more and more storage devices. Although these devices are becoming less expensive, they still need power to operate them and mechanisms to cool them. It is expected that providing applications via mobile tools will continue growing rapidly. This will entail more server capability and rise in the demand for computing power in data centers. This is also a potential area for virtualization. Due to virtualization and integration, data centers are now able to push more into a rack. This has led to an increase in the power consumption per square foot by a factor of 10 or so. Cloud computing is becoming more and more popular as it provides scalable and resilient IT-enabled resources using the Internet means. In addition to the trends and challenges in green ICT, we will be presenting some of our related research works. We propose a Dynamic Energy Efficient and Secure Routing Protocol for Wireless Sensor Networks in Urban Environments, DEESR. A decision is made by every node based on various parameters like longevity, distance, and battery power, which measure the node and link quality to decide the next hop in the route. This ensures that the total load is distributed evenly while conserving the energy of battery-constrained nodes. The protocol also maintains a trusted population for each node through Dynamic Trust Factor (DTF), which ensures secure communication in the environment by gradually isolating the malicious nodes. The results obtained show that the proposed protocol when compared with other energy efficient protocols such as the MMBCR and DSR gives far better results in terms of energy efficiency. We also introduce an Efficient Reactive and Angular – Optimized Link State Routing (ERA-OLSR) for MANETs. It is observed that ERA-OLSR performs better than both AODV and DSR in terms of end-to-end delay and average energy consumed. ERA-OLSR is best suited for dense scenarios. The simulation results obtained after implementing the proposed protocol have shown that ERA-OLSR has better performance than both AODV and DSR in terms of End-to-end delay and Average Energy Consumption.

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.

## The 2010 IEEE/ACM International Conference on Green Computing and Communications (GreenCom2010)

### *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.

## The 2010 IEEE/ACM International Conference on Green Computing and Communications (GreenCom2010)

### *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.

## The 2010 IEEE/ACM International Conference on Green Computing and Communications (GreenCom2010)

### *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 a 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.

# The GreenCom 2010 Technical Program

<b>Saturday, December 18, 2010</b>	
08:20-9:10	GreenCom keynote: Mohammad S. Obaidat (Chair: Honggang Zhang)
9:10-10:00	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	GreenCom 1 <span style="float: right;">GreenCom 2</span>
15:10-15:30	Coffee Break
15:30-16:45	GreenCom 3 <span style="float: right;">GreenCom 4</span>
16:45-18:00	GreenCom 5 <span style="float: right;">GreenCom 6</span>

## 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
2. A Group-Based Mobile Agent Routing Protocol for Multitype Wireless Sensor Networks  
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
4. An Energy Efficient Path Finding Query Protocol in Wireless Sensor Networks  
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
3. QoS-Aware Self-adaptation of Communication Protocols in Pervasive Service Middleware  
Weishan Zhang, Klaus Marius Hansen, João Fernandes, Julian Schüette, 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
2. Statistical Power and Performance Modeling for Optimizing the Energy Efficiency of Scientific Computing  
Balaji Subramaniam, Wu-chun Feng
3. Enabling Energy-efficient Analysis of Massive Neural Signals using GPGPU  
Dan Chen, Lizhe Wang, Shuaiting Wang, Muzhou Xiong, Gregor von Laszewski, Xiaoli Li
4. Analysis of Parallel Algorithms for Energy Conservation with GPU  
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
2. Virtual Machine Based Energy-Efficient Data Center Architecture for Cloud Computing: A Performance Perspective  
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**

08:00-08:20	Registration
16.45-18.00	GreenCom Panel (Chair: Zhongfei Zhang)

**GreenCom 2010 Panel**

Title: Current Trends in Low Power Computing and Communication Systems

Panelists:

Zhongfei Zhang (Chair), Zhejiang University, China and SUNY Binghamton, USA  
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

08:00-08:20	Registration	
09:10-10:00	GreenCom keynote: Hai Jin (Chair: Tianzhou Chen)	
10:00-10:20	Coffee Break	
10:20-11:10	GreenCom keynote: Luoning Gui (Chair: Feng Xia)	
12:00-13:30	Lunch	
13:30-15:10	GreenCom 7	GreenCom 8
15:10-15:30	Coffee Break	
15:30-16:45	GreenCom 9	GreenCom 10
16:45-18:00	GreenCom 11	GreenCom 12

### 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, Shuaiwen 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 Kliazovitch, 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 Mori

### 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, Qiufen 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, Haoting 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 Moulrierac, and Brice Onfroy
2. Energy Efficient Client-centric Shaping of Multi-flow TCP Traffic  
Ahmad Nazir Raja, Zihua Jin, and Matti Siekkinen
3. PEARL: Power-aware, Dependable, and High-Performance Communication Link using PCI Express  
Toshihiro Hanawa, Taisuke Boku, Shin'ichi Miura, Mitsuhsa 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
5. An Efficient and Secure Routing Protocol for Wireless Sensor Networks Using Multicasting  
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
3. Kernel Fusion: An Effective Method for Better Power Efficiency on Multithreaded GPU  
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, Xianghua 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
3. Cherub: Power Consumption Aware Cluster Resource Management  
Simon Kiertscher, Jörg Zinke, Stefan Gasterstädt, and Bettina Schnor

## Sunday, December 19, 2010

08:00-08:20	Registration
12:00-13:30	Lunch
13:30-15:10	EaCN 4
15:10-15:30	Coffee Break
16:45-18:00	GreenCom Panel (Chair: Zhongfei Zhang)

### 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
3. Performance Evaluation of Real-Time Scheduling Heuristics for Energy Harvesting Systems  
Maryline Chetto and Hui Zhang

## Monday, December 20, 2010

09:10-10:00	GreenCom keynote: Hai Jin (Chair: Tianzhou Chen)
10.00-10.20	Coffee Break
10:20-11:10	GreenCom keynote: Luoning Gui (Chair: Feng Xia)
12:00-13:30	Lunch
13:30-15:10	EaCN 5
15:10-15:30	Coffee Break
15:30-16:45	EaCN 6
16:45-18:00	EaCN 7

### EaCN 5: Embedded and Ubiquitous Computing

#### Session Chair: Yukihiro Nakagawa

1. Energy-Efficient Web Access on Mobile Devices  
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 Wakil
3. Energy-efficient Routing in User-centric Environments  
Antonio Júnior and Rute Sofia

### EaCN 7: Computer Architecture II

#### Session Chair: Antonio Junior

1. A Single-Chip, 10-Gigabit Ethernet Switch LSI for Energy-Efficient Blade Servers  
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

<b>Saturday, December 18, 2010</b>	
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	IOTS1
15:10-15:30	Coffee Break
15:30-16:45	IOTS 2
16:45-18:00	IOTS 3

## **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, Teng kai 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

09:10-10:00	IOTS keynote: Huadong Ma (Chair: Zhikui Chen)
12:00-13:30	Lunch
13:30-15:10	IOTS 4
15:10-15:30	Coffee Break
16:45-18:00	GreenCom Panel

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

1. D-TDMA: An Approach of Dynamic TDMA Scheduling for Target Tracking in Wireless Sensor Networks  
Yun Wang, Peizhong Shi, Kai Li, and Zhikui Chen
2. A Communication Protocol of Wireless Sensor Network for Mobile Healthcare System  
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

<b>Monday, December 20, 2010</b>	
08:20-09:10	GreenCom keynote: Hai Jin (Chair: Tianzhou Chen)
10.00-10.20	Coffee Break
10:20-11:10	GreenCom keynote: Luoning Gui (Chair: Feng Xia)
12.00-13.30	Lunch
13:30-15:10	GCCN

## **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

# CPSCCom 2010 Organizing and Program Committees

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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

About the keynote speaker



Witold Pedrycz (M'88, SM'90, F'99) is a Professor and Canada Research Chair (CRC - Computational Intelligence) in the Department of Electrical and Computer Engineering, University of Alberta, Edmonton, Canada. He is also with the Systems Research Institute of the Polish Academy of Sciences, Warsaw, Poland. He also holds an appointment of special professorship in the School of Computer Science, University of Nottingham, UK. In 2009 Dr. Pedrycz was elected a foreign member of the Polish Academy of Sciences. His main research directions involve Computational Intelligence, fuzzy modeling and Granular Computing, knowledge discovery and data mining, fuzzy control, pattern recognition, knowledge-based neural networks, relational computing, and Software Engineering. He has published numerous papers in this area. He is also an author of 14 research monographs covering various aspects of Computational Intelligence and Software Engineering. Witold Pedrycz has been a member of

numerous program committees of IEEE conferences in the area of fuzzy sets and neurocomputing. Dr. Pedrycz is intensively involved in editorial activities. He is an Editor-in-Chief of Information Sciences and Editor-in-Chief of IEEE Transactions on Systems, Man, and Cybernetics - part A. He currently serves as an Associate Editor of IEEE Transactions on Fuzzy Systems and a number of other international journals. He has edited a number of volumes; the most recent one is entitled "Handbook of Granular Computing" (J. Wiley, 2008). In 2007 he received a prestigious Norbert Wiener award from the IEEE Systems, Man, and Cybernetics Council. He is a recipient of the IEEE Canada Computer Engineering Medal 2008. In 2009 he has received a Cajastur Prize for Soft Computing from the European Centre for Soft Computing for "pioneering and multifaceted contributions to Granular Computing".

**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.

## The 3rd IEEE/ACM International Conference on Cyber, Physical and Social Computing (CPSCoM2010)

### *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.

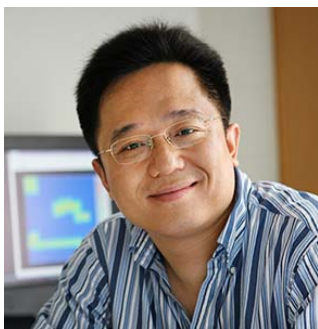
In this talk, challenges faced in EMO research will be discussed and various EMO features and algorithms will be presented. Specifically, the impact of noise uncertainties on MO optimization will be described and the approaches/modifications to basic algorithmic design for robust optimization will be 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.

## The 4th Asia-Pacific Embedded Systems Education and Research Conference (APESER 2010)

### *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)

### *Keynote: New Challenges in Emerging Cyber-Physical Systems --- Event Modeling and Composition in Loosely Coupled Networked Control Systems*

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.

## The 4th Asia-Pacific Embedded Systems Education and Research Conference (APESER 2010)

### *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.

## The 4th Asia-Pacific Embedded Systems Education and Research Conference (APESER 2010)

### *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

08:00-18:00	Registration
08:00-08:20	Opening Ceremony
10:00-10:20	Coffee Break
12:00-13:30	Lunch
13:30-15:10	CPSCom1
15:10-15:30	Coffee Break
15:30-16:45	CPSCom 2
16:45-18:00	CPSCom 3

### 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

08:00-08:20	Registration
08:20-09:10	CPSCoM keynote: Kay Chen Tan (Chair: Peidong Zhu)
10:00-10:20	Coffee Break
11:10-12:00	CPSCoM keynote: Feiyue Wang (Chair: Jianhua Ma)
12:00-13:30	Lunch
13:30-15:10	CPSCoM 4
15:10-15:30	Coffee Break
15:30-16:45	CPSCoM Panel (Chair: Huan Liu)

### CPSCoM 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

## CPSCoM 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  
Zhongfei (Mark) Zhang, Zhejiang University and SUNY Binghamton

## Monday, December 20, 2010

08:00-08:20	Registration
08:20-09:10	CPSCom keynote: Witold Pedrycz (Chair: Sun-Ki Chai)
10:00-10:20	Coffee Break
12:00-13:30	Lunch
13:30-15:10	CPSCom 5
15:10-15:30	Coffee Break
15:30-16:45	CPSCom 6
16:45-18:00	CPSCom 7

### 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 Cleeff, Wolter Pieters, and Roel Wieringa
3. BABAC: An Access Control Framework for Network Virtualization Using User Behaviors and Attributes  
Yanzhe Che, Qiang Yang, Chunming Wu, and Lianhang Ma

# The WiSARN-Fall 2010 Technical Program

## Monday, December 20, 2010

08:00-08:20	Registration
8.20-09.10	CPSCoM keynote: Witold Pedrycz (Chair: Sun-Ki Chai)
10:00-10:20	Coffee Break
12:00-13:30	Lunch
15:10-15:30	Coffee Break
15:30-16:45	WiSARN 1
16.45-18.00	WiSARN 2

### 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
2. SN-MPR: A Multi-Point Relay Based Routing Protocol for Wireless Sensor Networks  
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

1. Minimum Cost Routing with a Lifetime Guarantee in Wireless Sensor Networks  
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

08:00-08:20	Registration
8.20-09.10	CPSCo keynote: Witold Pedrycz (Chair: Sun-Ki Chai)
10:00-10:20	Coffee Break
12:00-13:30	Lunch
15:10-15:30	Coffee Break
15:30-16:45	SocialNet 1
16:45-18:00	SocialNet 2

### 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

## Monday, December 20, 2010

08:00-08:20	Registration
08.20-9.10	CPSCCom keynote: Witold Pedrycz (Chair: Sun-Ki Chai)
10:00-10:20	Coffee Break
12:00-13:30	Lunch
13.30-15.10	UUMA
15:10-15:30	Coffee Break

### 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

<b>Saturday, December 18, 2010</b>	
08:00-18:00	Registration
08:00-08:20	Opening Ceremony
10:00-10:20	Coffee Break
10:20-11:10	APESER keynote: Marco Di Natale (Chair: Ian McLoughlin)
11:10-12:00	APESER keynote: Shangping Ren (Chair: Ian McLoughlin)
12:00-13:30	Lunch
13:30-15:10	APESER 1
15:10-15:30	Coffee Break
15:30-16:45	APESER 2
16:45-18:00	APESER 3

## **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

08:00-08:20	Registration
10:00-10:20	Coffee Break
10:20-11:00	APESER keynote: Chenyang Lu (Chair: Peidong Zhu)
12:00-13:30	Lunch
13:30-15:10	APESER 4
15:10-15:30	Coffee Break
19:00-21:00	Banquet Dinner

### 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

## Monday, December 20, 2010

08:00-08:20	Registration
10:00-10:20	Coffee Break
11:10-12:00	APESER keynote: Samarjit Chakraborty (Chair: Zonghua Gu)
12:00-13:30	Lunch



## **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 you 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

