

**The 4th International Conference on  
Ubiquitous Intelligence and Computing  
(UIC-2007)  
&  
The 4th International Conference on  
Autonomic and Trusted Computing  
(ATC-2007)**



Organized by Department of Computing,  
The Hong Kong Polytechnic University, China  
In Cooperation with the IEEE Computer Society  
Hong Kong, China, July 11-13, 2007

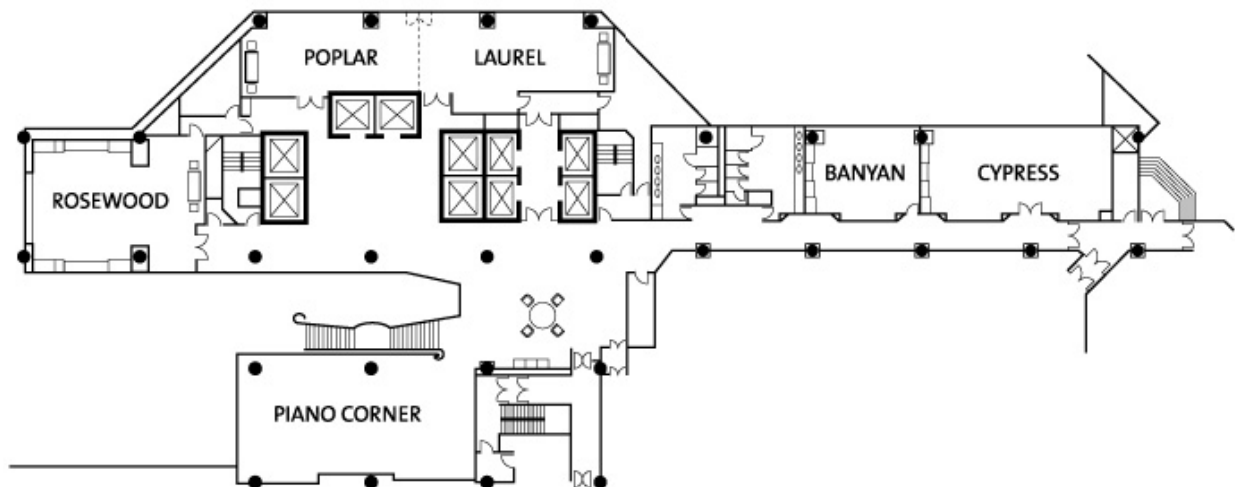
# PROGRAM OF UIC-07 AND ATC-07 AT A GLANCE

<b>July 10 (Tuesday)</b>				
13:00-18:00	Registration ( <i>Pre-function area</i> )			
<b>July 11 (Wednesday)</b>				
08:00-18:00	Registration ( <i>Pre-function area</i> )			
08:30-08:45	Opening Ceremony ( <i>The Four Seasons Suites</i> )			
08:45-09:45	Keynote 1 ( <i>The Four Seasons Suites 1-4, level 2</i> ): Autonomic and Trusted Computing for Ubiquitous Intelligence, Tosiyasu L. Kunii			
9:45-10:15	Coffee Break ( <i>Pre-function Area, The Four Seasons Suites 1-4, level 2</i> )			
10:15-13:00	Session 1A ( <i>Rosewood, level 3</i> ): Intelligent Computing: Models and Services I	Session 1B ( <i>Poplar, level 3</i> ): Smart Objects and Embedded Systems I	Session 1C ( <i>Laurel, level 3</i> ): Context-aware Applications	Session 1D ( <i>Cypress, level 3</i> ): Cryptography and Signatures
13:00-14:00	Lunch ( <i>The Four Seasons Suites 1-4, level 2</i> )			
14:00-16:00	Session 2A ( <i>Rosewood, level 3</i> ): Smart Spaces/ Environments/Services I	Session 2B ( <i>Poplar, level 3</i> ): Sensor Networks I	Session 2C ( <i>Laurel, level 3</i> ): Ad-hoc and Intelligent Networks I	Session 2D ( <i>Cypress, level 3</i> ): Autonomic Computing and Services
16:00-16:30	Coffee Break ( <i>Pre-function area, level 3</i> )			
16:30-18:00	Session 3A ( <i>Rosewood, level 3</i> ): Intelligent Computing: Models and Services II	Session 3B ( <i>Poplar, level 3</i> ): Service Oriented Middleware and Applications I	Session 3C ( <i>Laurel, level 3</i> ): Secure and Trusted Computing	Session 3D ( <i>Cypress, level 3</i> ): Secured Services and Applications
18:00-20:00	Cocktail Reception ( <i>The Piano Corner, level 3</i> )			
<b>July 12 (Thursday)</b>				
08:30-09:30	Keynote 2 ( <i>The Four Seasons Suites 1-4, level 2</i> ): Remarks on Self-organisation and Trust in Organic Computing Systems, Hartmut Schmeck			
09:30-10:30	Keynote 3 ( <i>The Four Seasons Suites 1-4, level 2</i> ): An Intelligent Home System as a Development and Test Platform for Ubiquitous Computing, Keith C.C. Chan			
10:30-11:00	Coffee Break ( <i>Pre-function Area, The Four Seasons Suites 1-4, level 2</i> )			
11:00-13:00	Session 4A ( <i>Rosewood, level 3</i> ): Pervasive Communication and Mobile Systems I	Session 4B ( <i>Poplar, level 3</i> ): Sensor Networks II	Session 4C ( <i>Laurel, level 3</i> ): Security, Safety and Privacy I	Session 4D ( <i>Cypress, level 3</i> ): Trusted Models and Systems
13:00-14:00	Lunch ( <i>The Four Seasons Suites 1-4, level 2</i> )			
14:00-16:00	Session 5A ( <i>Rosewood, level 3</i> ): Smart Spaces/ Environments/Services II	Session 5B ( <i>Poplar, level 3</i> ): Sensor Networks III	Session 5C ( <i>Laurel, level 3</i> ): Ad-hoc and Intelligent Networks II	Session 5D ( <i>Cypress, level 3</i> ): Intrusion Detection
16:00-16:30	Coffee Break ( <i>Pre-function area, level 3</i> )			
16:30-18:00	Panel Discussion ( <i>Poplar and Laurel, level 3</i> )			
18:00-21:00	Banquet (Gather at level 3 at 18:00)			

July 13 (Friday)				
08:30-10:30	Session 6A (Rosewood, level 3): Pervasive Communication and Mobile Systems II	Session 6B (Poplar, level 3): Sensor Networks IV	Session 6C (Laurel, level 3): Smart Objects and Embedded Systems II	Session 6D (Cypress, level 3): Access Control
10:30-11:00	Coffee Break (Pre-function area, level 3)			
11:00-13:00	Session 7A (Rosewood, level 3): Service Oriented Middleware and Applications II	Session 7B (Poplar, level 3): Sensor Networks V	Session 7C (Laurel, level 3): Context-aware Applications and Systems I	Session 7D (Cypress, level 3): Trusted Computing and Communications
13:00-14:00	Lunch (The Four Seasons Suites 1-4, level 2)			
14:00-16:00	Session 8A (Rosewood, level 3): Security, Safety and Privacy II	Session 8B (Poplar, level 3): Sensor Networks VI	Session 8C (Laurel, level 3): Key Management	Session 8D (Cypress, level 3): Worm Detection and Data Security
16:00-16:30	Coffee Break (Pre-function area, level 3)			
16:30-18:00	Session 9A (Rosewood, level 3): Smart Spaces/ Environments/Services III	Session 9B (Poplar, level 3): Ad-hoc and Intelligent Networks III	Session 9C (Laurel, level 3): Autonomic Models and Architectures	Session 9D (Cypress, level 3): Fault-tolerant Systems

July 14 (Saturday)	
08:15-18:30	Tour to Macau (optional)

**Notice: Session xA-xC are of UIC-07 except 3C, 8C, 9C, and Session xD are of ATC-07**



# KEYNOTE SPEAKERS

## Autonomic and Trusted Computing for Ubiquitous Intelligence

Tosiyasu L. Kunii, IT Institute, Kanazawa Institute of Technology, Japan

<http://www.kunii.com/>

### About the Speaker

Tosiyasu L. Kunii is currently Professor and IT Institute Director at Kanazawa Institute of Technology, Distinguished Professor and Advisor of Beihang University in Beijing, Honorary Visiting Professor of University of Bradford in UK, and Professor Emeritus of the University of Tokyo and of the University of Aizu. He was Professor of Hosei University from 1998 to 2003. Before that he served as the Founding President and Professor of the University of Aizu dedicated to computer science and engineering as a discipline, from 1993 to 1997. He had been Professor of Department of Computer and Information Science at the University of Tokyo from June 1978 until March 1993, after serving as Associate Professor at Computer Centre of the University of Tokyo in October 1969. He was visiting professors at University of California at Berkeley in 1994 and University of Geneva in 1992. He received his B.Sc. in 1962, M.Sc. in 1964 and D.Sc. in 1967 all from the University of Tokyo. He received the 1998 Taylor L. Booth Education Award the highest education award of IEEE Computer Society given to one individual a year. He is Life Fellow of IEEE and Fellow of IPSJ.

He has published over 50 books and over 400 refereed papers in computer science. Dr. Kunii was Founder and Editor-in-Chief of *The Visual Computer: An International Journal of Computer Graphics* (Springer-Verlag) (1984-1999), and *International Journal of Shape Modeling* (World Scientific) (1994-1995), and was Associate Editor of *IEEE Computer Graphics and Applications* (1982-2002). He is Associate Editor-in-Chief of *The Journal of Computer Animation and Virtual Worlds* (John Wiley & Sons) (1990- ) and on the Editorial Board of *Information Systems Journal* (1976-), and *Information Sciences Journal* (1983-).

### Summary

The real world we live has been expanding globally, integrating almost all local activities in business, finance, commerce, politics, industry, education and culture, via cyberworlds that attach e- to all. The strength of cyberworlds lies on its speed and unlimited power of reutilization supported by cyberspaces as networked computational spaces spanning the entire real world ubiquitously. It was 1968 cyberworlds in cyberspaces faced me with thrills of finding infinitely spanning worlds at light speed.

To define cyberworlds in cyberspaces clearly we have to find the laws governing them. It is the same situation with the world of matter. The world of matter was understood clearly only by finding its invariants such as mass and energy. From the invariants, physics has derived theories to govern the whole material world as variants. Cyberworlds are information worlds. Hence, finding the invariants of information worlds is the key to the success. The laws of information worlds as the discipline belong to what we call mathematics. Mathematical invariants are, in most general cases, equivalence relations. This means, autonomous and trusted computing is automatically achieved through equivalence relations and attaching functions. Autonomous computing means we build information systems automatically without human intervention that is achieved by automatically constructing information systems by relating components via attaching functions in a valid manner. The results are trusted because they carry out only validated construction through invariant preservation.

For us to conduct any activities in the real world in physical spaces and cyberworlds in cyberspaces, we have to cognize them in conceptual worlds in conceptual and cognitive spaces. The intelligent parts of cognition for conceptualization rely on induction of concepts from cumulative knowledge gathered ubiquitously on the Web from cyberworlds and also physical devices ubiquitously in the real world, and then rely on deduction to apply the results of conceptualization to individual instances. Induction and deduction based on traditional logic are found to be too limited in their capability, and they are becoming topological, algebraic topological in particular to compute.

For intelligence to be autonomic and trusted, the invariants as explained so far play the central role. Autonomy is achieved by integrating all the cyberworlds by attaching functions based on invariants autonomously, and by deducing rapidly evolving variants from invariants also autonomously, to make the results trusted. Autonomous

visual computing based on differential topology for autonomous digital contents generation is of increasing interest in the ubiquitous information communication community, and we have achieved the core portion for presentation in this talk.

# Remarks on Self-organisation and Trust in Organic Computing Systems

Hartmut Schmeck, Karlsruhe Institute of Technology, Germany

[http://www.aifb.uni-karlsruhe.de/Personen/viewPerson?id\\_db=29](http://www.aifb.uni-karlsruhe.de/Personen/viewPerson?id_db=29)

## About the Speaker

Hartmut Schmeck is a Full Professor of Applied Informatics and director of the Institute AIFB at the University of Karlsruhe (now called Karlsruhe Institute of Technology). He has held visiting positions at Queen's University (Kingston, Canada, 1983/84), Technical University of Denmark (Lyngby, Denmark, 1990), University of Hildesheim (1989) and University of Munster (1990/91). He got his Habilitation (1990), Dr.rer.nat (1981), and Diploma (1975) in Informatics, all from the University of Kiel (Germany). From 2000 to 2002 he has been Dean of the Faculty of Economics and Business Engineering of the University of Karlsruhe; from 2002 to 2006 he was the chairperson of the Section of Computer Engineering of the Gesellschaft für Informatik.

He is (co-)author of more than 110 publications on advanced algorithms and architectures, in particular on bio-inspired methods in optimization and algorithms for reconfigurable architectures. He has been program and conference chair for several international conferences and workshops, is a key member of the "Organic Computing Initiative" and coordinator of the DFG priority program SPP 1183 on "Organic Computing". His research interests within this initiative focus on methods and architectures for controlled self-organization and on organic traffic control.

## Summary

The vision of Organic Computing postulates the advent of multitudes of services provided by collections of intelligent devices by means of self-organized cooperation. Due to their large numbers and their versatile interactions in potentially unlimited networks, it will be unfeasible to explicitly control the behavior of these (partially mobile) devices and their services. Therefore, they will have to respond autonomously in an intelligent way to changing parameters in their environment in order to guarantee appropriate degrees of behavioral robustness and flexibility. Because of these life-like properties, they are called Organic Computing systems. Apparently, the behavior of adaptive, self-organized systems might be hard to predict. At the same time, these systems will have to be trustworthy to be accepted by human users, otherwise, their potential benefits would not be exploited. A necessary prerequisite for establishing and maintaining trust will be the possibility to influence the behavior of Organic Computing systems in a controlled way whenever the system is moving into behavioral regions that are viewed to be unacceptable by human users or by their current execution environment. Hence, an important facet of Organic Computing is the presence of controlled self-organization, enabled by appropriately designed observer/controller mechanisms and methods of data analysis. The talk will elaborate on the state of the art in the area of Organic Computing and, in particular, will focus on possibilities and problems for the engineering of trustworthy organic systems.

# An Intelligent Home System as a Development and Test Platform for Ubiquitous Computing

Keith C.C. Chan, The Hong Kong Polytechnic University, Hong Kong

<http://www.comp.polyu.edu.hk/people/ckcchan.html>

## About the Speaker

Prof. Keith Chan obtained his B.Math. (Hons.) in Computer Science and Statistics, and M.A.Sc. and Ph.D. degrees in Systems Design Engineering from the University of Waterloo, Waterloo, Ontario, Canada. He has a number of years of academic and industrial experience in software development and management. He joined the IBM Canada Laboratory, Toronto Canada, in 1989, where he was involved in the development of multimedia and software engineering tools. In 1993, he joined the Department of Electrical and Computer Engineering at Ryerson University, Toronto, Ontario, Canada as an Associate Professor. He returned to HK in 1994 to join the Hong Kong Polytechnic University where he is currently a Professor and Head of the Department of Computing. He co-founded a Joint Software Engineering Laboratory with the Institute of Software of the Chinese Academy of Sciences and is now serving as a Co-director of the Lab. He is also a Guest Professor of the Graduate University of the Chinese Academy of Sciences. Prof. Chan has provided consultancy services to government agencies and large and small to medium sized companies in Hong Kong, China, Singapore, Malaysia, and Italy. His research interests are in Data Mining, Software Engineering and Pervasive Computing.

## Summary

Ubiquitous Computing is concerned with the thorough integration of information processing into everyday objects and activities. As such, someone engaging in ubiquitous computing should be able to enjoy the many benefits it is supposed to bring about at home. Since 2000, a team at the Department of Computing of The Hong Kong Polytechnic University has been developing an Ubiquitous Intelligent Home (UIH) that can demonstrate how a user can interact with “computers” at home in such a way that the user does not have to be aware that he or she is doing so. The UIH consists of four interconnecting networks: an appliance network, a furniture network, a telehealth network, and a security network. Each of these networks is made up of both hardware and software that are designed and developed to try to achieve the kind of ideal ubiquitous computing environment – one that is made up of small, inexpensive, robust networked processing devices, distributed at all scales throughout everyday life. The UIH project has so far been “pervasive” not only in terms of its potential applications but also in terms of the researchers involved. Throughout its development, we have involved researchers in almost all areas of computing including those working on wireless sensor networking, sensor data management, data stream processing, RFID, embedded systems design, distributed processing, artificial intelligence, agent theory, speech recognition, image and video analysis, signal processing, data mining, computational intelligence, Chinese computing, data mining and machine learning, text mining, information retrieval, gesture recognition, biometrics, text-to-speech processing, software engineering, etc. In this talk, we will give the details of the UIH.

# SCHEDULE FOR UIC-07 AND ATC-07

## July 10 (Tuesday)

13:00–18:00 Registration (Pre-function area)

## July 11 (Wednesday)

08:30–08:45 Opening Ceremony (The Four Seasons Suites, level 2)

Chair: [Jiannong Cao/Bin Xiao](#)

08:45–09:45 Keynote 1 (The Four Seasons Suites 1-4, level 2)

Chair: [Stephen S. Yau](#)

*Autonomic and Trusted Computing for Ubiquitous Intelligence, Toshiyasu L. Kunii*

09:45–10:15 Coffee Break

10:15–13:00 Concurrent Sessions 1A, 1B, 1C, 1D

**Session 1A: Intelligent Computing: Models and Services I (Rosewood, level 3)**

Session Chair: [Jianhua Ma](#)

Symbiotic Computing: Concept, Architecture and its Applications (invited paper), *Takuo Suganuma, Kenji Sugawara, Norio Shiratori*

Multi-agent Software Control System with Hybrid Intelligence for Ubiquitous Intelligent Environments, *Kevin I-Kai Wang, Waleed H. Abdulla, Zoran Salcic*

IUMELA: A Lightweight Multi-Agent Systems Based Mobile Learning Assistant using the ABITS Messaging Service, *Elaine McGovern, Bernard Roche, Eleni Mangina-Phelan, Rem Collier*

Towards Intuitive Spatiotemporal Communication between Human and Ubiquitous Intelligence Based on Mental Image Directed Semantic Theory, *Masao Yokota*

Graph-based Semantic Description in Medical Knowledge Representation and 3D Coronary Vessels Recognition, *Marek Ogiela, Ryszard Tadeusiewicz, Miroslaw Trzupek*

Persistent Storage System for Efficient Management of OWL Web Ontology, *Dongwon Jeong, Myounghoi Choi, Yang-Seung Jeon, Youn-Hee Han, Laurence T. Yang, Young-Sik Jeong, Sung-Kook Han*

Prediction-based Dynamic Thread Pool Management of Agnet Platform for Ubiquitous Computing, *Ji Hoon Kim, Seungwok Han, Hyun Ko, Hee Yong Youn*

**Session 1B: Smart Objects and Embedded Systems I (Poplar, level 3)**

Session Chair: [Tadanori Mizuno](#)

Sensitivity Improvement of the Receiver Module in the Passive Tag Based RFID Reader, *Seunghak Rhee, Jongan Park, Jonghun Chun*

Q+-Algorithm: An Enhanced RFID Tag Collision Arbitration Algorithm, *Donghwan Lee, Kyungkyu Kim, Wonjun Lee*

Surface-embedded Passive RF Exteroception: Kepler, Greed, and Buffon's Needle, *Vladimir Kulyukin, Aliasgar Kutiyawala, Minghui Jiang*

Development of a Single 3-axis Accelerometer Sensor Based Wearable Gesture Recognition Band, *Il-Yeon Cho, John Sunwoo, Yong-Ki Son, Myoung-Hwan Oh, Cheol-Hoon Lee*

An Enhanced Ubiquitous Identification System Using Fast Anti-collision Algorithm, *Choong-Hee Lee, Seong-Hwan Oh, Jae-Hyun Kim*

Certification Tools of Ubiquitous Mobile Platform, *Sang Yun Lee, Byung Uk Choi*

**Session 1C: Context-aware Applications and Systems I (Laurel, level 3)**

Session Chair: [Jadwiga Indulska](#)

Context Script Language and Processor for Context-Awareness in Ubiquitous Intelligent Environment, *Jae-Woo Chang, Yong-Ki Kim*

A Semantics-based Framework for Context-Aware Services: Lessons Learned and Challenges, *Theodore Patkos, Antonis Bikakis, Grigoris Antoniou, Maria Papadopouli, Dimitris Plexousakis*

Devising a Context Selection-Based Reasoning Engine for Context-Aware Ubiquitous Computing Middleware, *Donghai Guan, Weiwei Yuan, Seongjin Cho, Andrey Gavrilov, Young-Koo Lee, Sungyoung Lee*

The u-Class based on Context-awareness, *Jae-Hyun Lim, Chi-Su Kim, Yong-Woo Lee*

Audio-Visual Fused Online Context Analysis toward Smart Meeting Room, *Peng Dai, Linmi Tao, Guangyou Xu*

UCIPE: Ubiquitous Context-based Image Processing Engine for Medical Image Grid, *Aobing Sun, Hai Jin, Ran Zheng, Ruhan He, Qin Zhang, Wei Guo, Song Wu*

**Session 1D: Cryptography and Signatures (Cypress, level 3)**

Session Chair: [Bin Xiao](#)

ZigBee Security Using Identity-Based Cryptography, *Son Thanh Nguyen, Chunming Rong*

Efficient Identity-based Signcryption Scheme for Multiple Receivers, *Yong Yu, Bo Yang, Xinyi Huang, Mingwu Zhang*

Identity-based Proxy Signature from Pairings, *Wei Wu, Yi Mu, Willy Susilo, Jennifer Seberry, Xinyi Huang*

Cryptanalysis of BGW Broadcast Encryption Schemes for DVD Content Protection, *Qianhong Wu, Willy Susilo, Yi Mu, Bo Qin*

A Digital Signature Mechanism and Authentication Scheme for Group Communication in Grid, *Yunfa Li, Hai Jin, Deqing Zou, Jieyun Chen, Zongfen Han*



Cryptanalysis of Server-aided RSA Key Generation Protocols at MADNES 2005, *Fanyu Kong, Jia Yu, Baodong Qin, Daxing Li*

**13:00–14:00 Lunch (The Four Seasons Suites 1-4, level 2)**

**14:00–16:00 Concurrent Sessions 2A, 2B, 2C, 2D**

**Session 2A: Smart Spaces/Environments/Services I (Rosewood, level 3)**

*Session Chair: Norio Shiratori*

A Smart Space Architecture for Location-based Spatial Audio Scenario Orchestration, *Lila Kim, Doo-Hyun Kim, Hwasun Kwon, Dongwoon Jeon, Keunsoo Lee*

CHASE: Context-aware Heterogenous and Adaptive Smart Environments Using Optimal Tracking for Resident's Comfort, *Navrati Saxena, Abhishek Roy, Jitae Shin*

A Methodology of Identifying Ubiquitous Smart Services for U-City Development, *Ohbyung Kwon, Jihoon Kim*

Simulated Intersection Environment and Learning of Collision and Traffic Data in the U & I Aware Framework, *Flora Dilys Salim, Seng Wai Loke, Andry Rakotonirainy, Shonali Krishnaswamy*

Dynamic Scheduling Protocol for Highly-reliable, Real-time Information Aggregation for Telematics Intersection Safety System(TISS), *Wang Won Han, Hongjae Park, Young Man Kim*

**Session 2B: Sensor Networks I (Poplar, level 3)**

*Session Chair: Wei Lou*

Proactive Data Delivery Scheme with Optimal Path for Dynamic Sensor Networks, *Kwang-Il Hwang, Tea-Young Kim, Doo-Seop Eom*

Low-Latency Routing for Energy-Harvesting Sensor Networks, *Hyuntaek Kwon, Donggeon Noh, Junu Kim, Joonho Lee, Dongeun Lee, Heonshik Shin*

A Localized Link Quality-Aware Optimization Mechanism for Routing Protocols in Wireless Sensor Networks, *Zhen Fu, Yuan Yang, Wen Cheng Yang, Jung-Hwan Kang, Myong-Soon Park*

Minimum Energy and Latency MAC protocol for Wireless Sensor Networks, *Muhammad Ali Malik, Byoung-Hoon Lee, Young-Bae Ko, Jai-Hoon Kim*

An Efficient Bi-Directional Flooding in Wireless Sensor Networks, *Woosuk Cha, Eun-Mi Kim, Bae-Ho Lee, Gihwan Cho*

**Session 2C: Ad-hoc and Intelligent Networks I (Laurel, level 3)**

*Session Chair: Han-chieh Chao*

Adaptive Multicast Trees on Static Ad-hoc Networks: Tradeoffs between Delay and Energy Consumption, *Sangman Moh*

Reliable Multicast MAC Protocol for Wireless Ad-hoc Networks, *Sung Won Kim, Byung-Seo Kim*

Mobility Tracking for Mobile Ad Hoc Networks, *Hui Xu, Min Meng, Jinsung Cho, Brian J. d'Auriol, Sungyung Lee*

Handover Cost Optimization in Traffic Management for Multi-homed Mobile Networks, *Shupeng Wang, Jianping Wang, Mei Yang, Xiaochun Yun, Yingtao Jiang*

2-Level Hierarchical Cluster-based Address Auto-configuration Technique in Mobile Ad-hoc Networks, *Uhjin Joung, Dongkyun Kim*

**Session 2D: Autonomic Computing and Services (Cypress, level 3)**

*Session Chair: Theo Ungerer*

Service-Context Knowledge-based Solution for Autonomic Adaptation, *Marcel Cremene, Michel Riveill*

Middleware based Context Management for the Component-based Pervasive Computing, *Di Zheng, Jun Wang, Yan Jia, Wei-Hong Han, Peng Zou*

Building Autonomic and Secure Service Oriented Architectures with MAWeS, *Valentina Casola, Emilio Pasquale Mancini, Nicola Mazzocca, Massimiliano Rak, Umberto Villano*

Biology as Inspiration towards a Novel Service Life-Cycle, *David Linner, Heiko Pfeffer, Ilya Radusch, Stephan Steglich*

Design of Service-based Systems with Adaptive Tradeoff between Security and Service Delay, *Stephen S. Yau, Min Yan, Dazhi Huang*

**16:00–16:30 Coffee Break**

**16:30–18:00 Concurrent Sessions 3A, 3B, 3C, 3D**

**Session 3A: Intelligent Computing: Models and Services II (Rosewood, level 3)**

*Session Chair: Masao Yokota*

A Ubiquitous Watch-over System based on Environmental Information and Social Knowledge, *Takuo Suganuma, Kazuhiro Yamanaka, Yoshikazu Tokairin, Hideyuki Takahashi, Kenji Sugawara, Norio Shiratori*

Ubiquitous Intelligent Information Push-Delivery for Personalized Content Recommendation, *Ranzhe Jing, Xun Qiu, Yiyi Tao, Caifen Guo, Zhiyun Xin*

Location-based Recommendation System using Bayesian User's Preference Model in Mobile Devices, *Moon-Hee Park, Jin-Hyuk Hong, Sung-Bae Cho*

Fuzzy-smith Control for QoS-Adaptive Notification Service, *Yuying Wang, Xingshe Zhou*

**Session 3B: Service Oriented Middleware and Applications I (Poplar, level 3)**

*Session Chair: Jiannong Cao*

Context-Aware Service Composition for Mobile Network Environments, *Choonhwa Lee, Wonjun Lee, Sunghoon Ko, Seungjae Lee*

A Context-Awareness Middleware based on Service-Oriented Architecture, *Eunhoe Kim, Jaeyoung Choi*

On the Design, Deployment and Use of Ubiquitous Systems, *R.S. Sohan, R.K. Harle*

Implementation and Quantitative Evaluation of UbiMDR Framework, *Jeong-Dong Kim, Dongwon Jeong, Jinhyung Kim, Yixin Jing, Doo-Kwon Baik*

### **Session 3C: Secure and Trusted Computing (Laurel, level 3)**

Session Chair: *Joon S. Park*

Provably Secure Identity-Based Threshold Unsigncryption Scheme, *Bo Yang, Yong Yu, Fagen Li, Ying Sun*

Final Fantasy – Securing On-line Gaming with Trusted Computing, *Shane Balfé, Anish Mohammed*

An Efficient and Secure Rights Sharing Method for DRM System Against Replay Attack, *Donghyun Choi, Yunho Lee, Hogab Kang, Seungjoo Kim, Dongho Won*

Establishing Trust Between Mail Servers to Improve Spam Filtering, *Jimmy McGibney, Dmitri Botvich*

### **Session 3D: Secured Services and Applications (Cypress, level 3)**

Session Chair: *Zheng Yan*

AAA for Spontaneous Roaming Agreements In Heterogeneous Wireless Networks, *Zhi (Judy) Fu, Minho Shin, John C. Strassner, Nitin Jain, Vishnu Ram, William A. Arbaugh*

A Prediction-based Fair Replication Algorithm in Structured P2P Systems, *Xianshu Zhu, Dafang Zhang, Wenjia Li, Kun Huang*

TransCom: A Virtual Disk based Self-Management System, *Li Wei, Yaoxue Zhang, Yuezhi Zhou*

Defending against Jamming Attacks in Wireless Local Area Networks, *Wei Chen, Danwei Chen, Guozi Sun, Yingzhou Zhang*

### **18:00–21:00: Cocktail Reception (The Piano Corner, level 3)**

## **July 12 (Thursday)**

### **08:80–09:30 Keynote 2 (The Four Seasons Suites 1-4, level 2)**

Chair: *Christian Müller-Schloer*

Remarks on Self-organisation and Trust in Organic Computing Systems, *Hartmut Schmeck*

### **09:30–10:30 Keynote 3 (The Four Seasons Suites 1-4, level 2)**

Chair: *Jiamong Cao*

An Intelligent Home System as a Development and Test Platform for Ubiquitous Computing, *Keith C.C. Chan*

### **10:30–11:00 Coffee Break**

### **11:00–13:00 Concurrent Sessions 4A, 4B, 4C, 4D**

#### **Session 4A: Pervasive Communication and Mobile Systems I (Rosewood, level 3)**

Session Chair: *Zhiwen Yu*

A Novel Architecture for Hierarchically Nested Network Mobility, *Hye-Young Kim, Jitae Shin*

Route Optimization using Scalable Cache Management for Intra-NEMO Communication, *Hyemee Park, Moonseong Kim, Hyunseung Choo*

Content Aware Selecting Method for Reducing the Response Time of an Adaptive Mobile Web Service, *Euisun Kang, Daehyuck Park, Younghwan Lim*

A Study of Speech Emotion Recognition and its Application to Mobile Services, *Won-Joong Yoon, Youn-Ho Cho, Kyu-Sik Park*

Mobility Driven Vertical Handover for Mobile IPTV Traffic in Hybrid IEEE 802.11e/16e Networks, *Eunjun Choi, Wonjun Lee, Joongheon Kim*

#### **Session 4B: Sensor Networks II (Poplar, level 3)**

Session Chair: *Jianping Wang*

Maximizing Network Lifetime under Reliability Constraints using a Cross-Layer Design in Dense Wireless Sensor Networks, *Shan Guo Quan, Young Yong Kim*

Adaptive Data Aggregation Scheme for Clustered Wireless Sensor Networks, *Huifang Chen, Hiroshi Mineno, Yoshitsugu Obashi, Tomohiro Kokogawa, Tadanori Mizuno*

Directed Diffusion Based on Link-Stabilizing Clustering for Wireless Sensor Networks, *Zude Zhou, Wenjun Xu, Fangmin Li, Xuehong Wu*

Voronoi Tessellation based Rapid Coverage Decision Algorithm for Wireless Sensor Networks, *Lei Wang, Haowei Shen, Zhe Chen, Yaping Lin*

A Clustering-based Approximation Scheme for in-Network Aggregation over Sensor Networks, *Lei Xie, Lijun Chen, Daoxu Chen, Li Xie*

#### **Session 4C: Security, Safety and Privacy I (Laurel, level 3)**

Session Chair: *Chunning Rong*

Petri Nets for the Verification of Ubiquitous Systems with Transient Secure Association, *Fernando Rosa-Velardo*

An Approach of Trusted Program Generation for User-Responsible Privacy, *Ken'ichi Takahashi, Zhaoyu Liu, Kouichi Sakurai*

Self-updating: Strong Privacy Protection Protocol for RFID-tagged Banknotes, *Eun Young Choi, Su Mi Lee, Jong-In Lim, Dong Hoon Lee*

Intelligent Detection Computer Viruses Based on Multiple Classifiers, *Boyun Zhang, Jianping Yin, Jingbo Hao*

Designated Verifier Signature: Definition, Framework and New Constructions, *Yong Li, Willy Susilo, Yi Mu, Dingyi Pei*

#### **Session 4D: Trusted Models and Systems (Cypress, level 3)**

Session Chair: [Wei Chen](#)

CuboidTrust: A Global Reputation-Based Trust Model in Peer-to-Peer Networks, *Ruichuan Chen, Xuan Zhao, Liyong Tang, Jianbin Hu, Zhong Chen*

A Trust Evolution Model for P2P Networks, *Yuan Wang, Ye Tao, Ping Yu, Feng Xu, Jian Lü*

An Adaptive Trust Control Model for a Trustworthy Component Software Platform, *Zheng Yan, Christian Prehofer*

Towards Trustworthy Resource Selection: A Fuzzy Reputation Aggregation Approach, *Chunmei Gui, Quanyuan Wu, Huaimin Wang*

#### **13:00–14:00 Lunch (The Four Seasons Suites 1-4, level 2)**

#### **14:00–16:00 Concurrent Sessions 5A, 5B, 5C, 5D**

#### **Session 5A: Smart Spaces/Environments/Services II (Rosewood, level 3)**

Session Chair: [Achilles Kameas](#)

Spontaneous Interaction Framework for Thin-Client Access to Services, *Brian Lim, Daqing Zhang, Manli Zhu, Song Zheng*

Towards A Model of Interaction for Mutual Aware Devices and Everyday Artifacts, *Sea Ling, Seng Wai Loke, Maria Indrawan*

A Peer-to-Peer Semantic-Based Service Discovery Method for Pervasive Computing Environment, *Baopeng Zhang, Yuanchun Shi, Xin Xiao*

Ubiquitous Healthcare Architecture using SmartBidet and HomeServer with Embedded Urinalysis Agent, *Sungho Ahn, Kyunghee Lee, Doo-Hyun Kim, Vinod Cherian Joseph*

Proactive Agriculture: An Integrated Framework for Developing Distributed Hybrid Systems, *Christos Goumopoulos, Achilles Kameas, Brendan O'Flynn*

#### **Session 5B: Sensor Networks III (Poplar, level 3)**

Session Chair: [Kenichi Takahashi](#)

Real-time Data Delivery in Wireless Sensor Networks: A Data-Aggregated, Cluster-based Adaptive Approach, *Shao-Liang Peng, Shan-Shan Li, Yu-Xing Peng, Wen-Sheng Tang, Nong Xiao*

A Location-Unaware Connected Coverage Protocol in Wireless Sensor Networks, *Yingchi Mao, Zhuoming Xu, Daoxu Chen*

Fuzzy-Based Reliable Data Delivery for Countering Selective Forwarding in Sensor Networks, *Hae Young Lee, Tae Ho Cho*

An Efficient Grid-Based Data Gathering Scheme in Wireless Sensor Networks, *Shiow-Fen Hwang, Kun-Hsien Lu, Hsiao-Nung Chang, Chyi-Ren Dow*

Grid-based Sense Schedule for Event Detection in Wireless Sensor Networks, *Xianghua Hu, Xuejun Yang*

#### **Session 5C: Ad-hoc and Intelligent Networks II (Laurel, level 3)**

Session Chair: [Zhijun Wang](#)

Replication in Intermittently Connected Mobile Ad-hoc Networks, *Ke Shi*

Rate-Adaption Channel Assignment and Routing Algorithm for Multi-Channel WirelessMAN Mesh Network, *Eric Hsiao-Kuang Wu, Wei-Li Chang, Hsuan-Hao Chan*

Neighbor-Aware Optimizing Routing for Wireless Ad-hoc Networks, *Xianlong Jiao, Xiaodong Wang, Xingming Zhou*

Gateway Zone Multi-path Routing in Wireless Mesh Networks, *Eric Hsiao-Kuang Wu, Wei-Li Chang, Chun-Wei Chen, Kevin Chihcheng Hsu*

On Estimating Path Capacity in Wireless Mesh Networks, *Qinqi Wang, Ming Xu, Xingui He*

#### **Session 5D: Intrusion Detection (Cypress, level 3)**

Session Chair: [Dmitri Botvich](#)

An Adaptive Spreading Activation Approach to Combating the Front-peer Attack in Trust and Reputation System, *Yufeng Wang, Yoshiaki Hori, Kouichi Sakurai*

Research on Cost-Sensitive Learning in One-Class Anomaly Detection Algorithms, *Jun Luo, Li Ding, Zhisong Pan, Guiqiang Ni, Guyu Hu*

Improved and Trustworthy Detection Scheme with Low Complexity in VBLAST System, *So-Young Yeo, Myung-Sun Baek, Hyoung-Kyu Song*

Stepping-Stone Detection via Request-Response Traffic Analysis, *Shou-Husan Stephen Huang, Robert Lychev, Jianhua Yang*

SPA Countermeasure Based on Unsigned Left-to-Right Recodings, *Sung-Kyoung Kim, Dong-Guk Han, Ho Won Kim, Kyo IL Chung, Jongin Lim*

#### **16:00–16:30 Coffee Break**

#### **16:30–18:00 Panel Discussion**

#### **18:00–21:00 Banquet**

## **July 13 (Friday)**

#### **08:30–10:30 Concurrent Sessions 6A, 6B, 6C, 6D**

#### **Session 6A: Pervasive Communication and Mobile Systems II (Rosewood, level 3)**

Session Chair: [Takuo Suganuma](#)

An Efficient Lifetime Setting Scheme in the MIPv6, *Hye-Young Kim, Jitae Shin*

Bridging OSGi Islands through SLP Protocol, *Choonhwa Lee, Jongkyu Yi, Wonjun Lee*

Selective Grid Access for Energy-Aware Mobile Computing, *Eunjeong Park, Heonshik Shin, Seung Jo Kim*

Cognitive Computing Resource Management for a Ubiquitous Wireless Access, *Vuk Marojevic, Nemanja Vucevic, Xavier Revés, Antoni Gelonch*

Research on UWB Signal Propagation Attenuation Model in Coal Mine, *Fangmin Li, Ping Han, Xuehong Wu, Wenjun Xu*

### **Session 6B: Sensor Networks IV (Poplar, level 3)**

*Session Chair: Eric Hsiao-Kuang Wu*

An Integrated and Flexible Scheduler for Sensor Grids, *Hock Beng Lim, Danny Lee*

A Lightweight Scheme for Node Scheduling in Wireless Sensor Networks, *Ming Liu, Yuan Zheng, Jiannong Cao, Wei Lou, Xiaomin Wang, Haigang Gong*

A Multi-tier, Multimodal Wireless Sensor Network for Environmental Monitoring, *Carlos Eduardo Rodrigues Lopes, Fern, Fernando Duarte Linhares, Michele Mendes Santos, Linnyer Beatrys Ruiz*

Wireless Sensor Networks, Making a Difference Tomorrow, *Mohamed Watfa*

Enabling Distributed Messaging with Wireless Sensor Nodes using TinySIP, *Sudha Krishnamurthy, Lajos Lange*

### **Session 6C: Smart Objects and Embedded Systems II (Laurel, level 3)**

*Session Chair: Zili Shao*

Dynamic Binding Framework for Open Device Services, *Gwyduk Yeom*

Design and Evaluation of Multitasking-based Software Communications Architecture for Real-time Sensor Networking Platforms, *Kyunghoon Jung, Byunghoon Kim, Changsoo Kim, Sungwoo Tak*

Automatic Partitioning Technique for Flash Memory on Linux-based Embedded Systems, *Yoonjae Lim, Young Jin Nam, Dae-Wha Seo*

Distributed Processing in Wireless Sensor Networks for Structural Health Monitoring, *Miaomiao Wang, Jiannong Cao, Bo Chen, Youlin Xu, Jing Li*

An Improved Fusion and Fission Architecture between Multi-Modalities Based on Wearable Computing, *Jung-Hyun Kim, Kwang-Seok Hong*

### **Session 6D: Access Control (Cypress, level 3)**

*Session Chair: Antonio Maña Gomez*

A New One-Way Isolation File-Access Method at the Granularity of a Disk-Block, *Wenyuan Kuang, Yaoxue Zhang, Li Wei, Nan Xia, Guangbin Xu, Yuezhi Zhou*

Novel Remote User Authentication Scheme Using Bilinear Pairings, *Chen Yang, Wenping Ma, Xinmei Wang*

On the Homonymous Role in Role-Based Discretionary Access Control, *Kai Ouyang, Xiaowen Chu, Yixin Jiang, Hsiao-Hwa Chen, Jiangchuan Liu*

Ontology Based Hybrid Access Control for Automatic Interoperation, *Yuqing Sun, Peng Pan, Ho-fung Leung, Bin Shi*

Recoverable Tamper Proofing Technique for Image Authentication Using Irregular Sampling Coding, *Kuo Lung Hung, Chin-Chen Chang*

### **10:30–11:00 Coffee Break**

### **11:00–13:00 Concurrent Sessions 7A, 7B, 7C, 7D**

#### **Session 7A: Service Oriented Middleware and Applications II (Rosewood, level 3)**

*Session Chair: Young-sik Jeong*

A Study on Ubiquitous Intelligent Healthcare Systems in Home Service Aggregation Business Model, *Mun-Suck Jang, Eung-Hyuk Lee, Sang-Bang Choi*

Performance Evaluation of 3-Hierarchical Resource Management Model with Grid Service Architecture, *Eun-Ha Song, Laurence T. Yang, Sung-Kook Han, Young-Sik Jeong*

A Key-Index Based Distributed Mechanism for Component Registration, *Ming Zhong, Yaoyue Zhang, Pengwei Tian, Yuezhi Zhou, Cunhao Fang*

BASCA: A Business Area-Oriented Service Component Adaptation Approach Suitable for Ubiquitous Environment, *Pengwei Tian, Yaoyue Zhang, Ming Zhong, Yuezhi Zhou, Cunhao Fang*

A Pervasive Service Framework for Pervasive Computing Applications, *Yong Zhang, Shensheng Zhang, Songqiao Han*

#### **Session 7B: Sensor Networks V (Poplar, level 3)**

*Session Chair: Yu Hua*

Localization and Synchronization for 3D Underwater Acoustic Sensor Networks, *Chen Tian, Wenyu Liu, Jiang Jin, Yi Wang, Yijun Mo*

An Energy-efficient Framework for Wireless Sensor Networks with Multiple Gateways, *Jinglun Shi, Taekyoung Kwon, Yanghee Choi, Junkai Huang, Weiping Liu*

Self-Configurable Structure for Tracking Moving Objects in Wireless Sensor Networks, *Sang-Sik Kim, Ae-Soon Park*

Secure Dynamic Network Reprogramming using Supplementary Hash in Wireless Sensor Networks, *Kwangkyu Park, JongHyup Lee, Taekyoung Kwon, JooSeok Song*

Self-Deployment of Mobile Nodes in Hybrid Sensor Networks by AHP, *Xiaoling Wu, Jinsung Cho, Brian J. d'Auriol, Sungyoung Lee, Hee Yong Youn*

#### **Session 7C: Context-aware Applications and Systems II (Laurel, level 3)**

*Session Chair: Daqing Zhang*

An Offset Algorithm for Conflict Resolution in Context-aware Computing, *Min Xi, Jizhong Zhao, Yong Qi, Hui He, Liang Liu*

Ontology-Based Semantic Recommendation for Context-Aware E-Learning, *Zhiwen Yu, Yuichi Nakamura, Seije Jang, Shoji Kajita, Kenji Mase*

Deployment of Context-aware Component-based Applications based on Middleware, *Di Zheng, Jun Wang, Yan Jia, Wei-Hong Han, Peng Zou*

Identifying a Generic Model of Context for Context-Aware Multi-Services, *Tae Hwan Park, Ohbyung Kwon*

Context Privacy and Obfuscation Supported by Dynamic

Context Source Discovery and Processing in a Context Management System, *Ryan Wishart, Karen Henricksen, Jadwiga Indulska*

### **Session 7D: Trusted Computing and Communications (Cypress, level 3)**

Session Chair: [Tony Li Xu](#)

A Decomposition Strategy based Trusted Computing method for Cooperative Control Problem faced with Communication Constraints, *Shieh-Shing Lin*

Formal Analysis of Secure Bootstrap in Trusted Computing, *Shuyi Chen, Yingyou Wen, Hong Zhao*

Calculating Trust Using Aggregation Rules in Social Networks, *Sanguk Noh*

Enhancing Grid Security Using Trusted Virtualization, *Hans Löhr, HariGovind V. Ramasamy, Ahmad-Reza Sadeghi, Stefan Schulz, Matthias Schunter, Christian Stübke*

A Wearable System for Outdoor Running Workout State Recognition and Course Provision, *Katsuhiro Takata, Masataka Tanaka, Jianhua Ma, Runhe Huang, Bernady O. Aduhan, Norio Shiratori*

**13:00–14:00: Lunch (The Four Seasons Suites 1-4, level 2)**

**14:00–16:00 Concurrent Sessions 8A, 8B, 8C, 8D**

### **Session 8A: Security, Safety and Privacy II (Rosewood, level 3)**

Session Chair: [Hartmut Schmeck](#)

Towards Secure Agent Computing for Ubiquitous Computing and Ambient Intelligence, *Antonio Maña, Antonio Muñoz, Daniel Serrano*

Improved Cryptanalysis of Three Remote User Authentication Schemes Using Smart Cards, *Raphael C.W. Phan, Bok-Min Goi*

Secret Key Revocation in Sensor Networks, *YoungJae Maeng, Abdelaziz Mohaisen, DaeHun Nyang*

Hybrid Key Establishment Protocol based on ECC for Wireless Sensor Network, *Yoon-Su Jeong, Sang-Ho Lee*

A Secure Pairwise Key Establishment Scheme in Wireless Ad-hoc Networks, *TaeYeon Kim, HeeMan Park, HyungHyo Lee*

### **Session 8B: Sensor Networks VI (Poplar, level 3)**

Session Chair: [Sudha Krishnamurthy](#)

Data Synchronization in Distributed and Constrained Mobile Sensor Networks, *Shuai Hao, Hock Beng Lim*

Reference Interpolation Protocol for Time Synchronization in Wireless Sensor Networks, *Chongmyung Park, Joahyoung Lee, Inbung Jung*

Mesh-based Sensor Relocation for Coverage Maintenance in Mobile Sensor Networks, *Xu Li, Nicola Santoro, Ivan Stojmenovic*

Neighbor Position-based Localization Algorithm for Wireless Sensor, *Yong Qian Chen, Young Kyoung Kim, Sang Jo Yoo*

Location Estimation with Mobile Nodes in Wireless Sensor Network, *Ying-Hong Wang, Chien-Min Lee, Wei-Ting Chen, Chieh-Hsin Kuo*

### **Session 8C: Key Management (Laurel, level 3)**

Session Chair: [Mark Manulis](#)

Malicious Participants in Group Key Exchange: Key Control and Contributiveness in the Shadow of Trust, *Emmanuel Bresson, Mark Manulis*

Efficient Implementation of The Keyed-Hash Message Authentication Code based on SHA-1 Algorithm for Mobile Trusted Computing, *Mooseop Kim, Youngse Kim, Jaecheol Ryou, Sungik Jun*

A Secure DRM Framework for User's Domain and Key Management, *Jinheung Lee, Sanggon Lee, Sanguk Shin*

A Secret-Key Exponential Key Agreement Protocol with Smart Cards, *Eun-Jun Yoon, Kee-Young Yoo*

Key Establishment Scheme for Sensor Networks with Low Communication Cost, *Yong Ho Kim, Hwaseong Lee, Jong Hyuk Park, Laurence T. Yang, Dong Hoon Lee*

### **Session 8D: Worm Detection and Data Security (Cypress, level 3)**

Session Chair: [Jianming Fu](#)

A Worm Containment Model based on Neighbor-Alarm, *Jianming Fu, Binglan Chen, Huanguo Zhang*

A Distributed Self-healing Data Store, *Wolfgang Trumler, Jörg Ehrig, Andreas Pietzowski, Benjamin Satzger, Theo Ungerer*

Malicious Codes Detection Based on Ensemble Learning, *Boyun Zhang, Jianping Yin, Jingbo Hao, Dingxing Zhang, Shulin Wang*

Generating Simplified Regular Expression Signatures for Polymorphic Worms, *Yong Tang, Xicheng Lu, Bin Xiao*

**16:00–16:30 Coffee Break**

**16:30–18:00 Concurrent Sessions 9A, 9B, 9C, 9D**

### **Session 9A: Smart Spaces/Environments/Services III (Rosewood, level 3)**

Session Chair: [Laurence T. Yang](#)

Integrating RFID Services and Ubiquitous Smart Systems for Enabling Organizations to Automatically Monitor, Decide, and Take Actions, *Thierry Bodhuin, Rosa Preziosi, Maria Tortorella*

Towards An RFID-Oriented Service Discovery System, *Beihong Jin, Lanlan Cong, Liang Zhang, Ying Zhang, Yuanfeng Wen*

Activity Recognition using an Egocentric Perspective of Everyday Objects, *Dipak Surie, Thomas Pederson, Fabien Lagriffoul, Lars-Erik Janlert, Daniel Sjölie*

A Novel Price Prediction Scheme of Grid Resources Based on Time Series Analysis, *Yu Hua, Dan Feng*

**Session 9B: Ad-hoc and Intelligent Networks III (Poplar, level 3)**

Session Chair: *Yan (Josh) Zhang*

A Meta Service Description Assisted Service Discovery Protocol for MANETs, *Zhenguao Gao, Ling Wang, Mei Yang, Jianping Wang*

On Characterizing Economic-based Incentive-compatible Mechanism to Solving Hidden Information and Hidden Action in Ad-hoc Network, *Yufeng Wang, Yoshiaki Hori, Kouichi Sakurai*

A Study on USN Technologies for Ships, *Seong-Rak Cho, Dong-Kon Lee, Bu-Geun Paik, Jae-Hoon Yoo, Young-Ha Park, Beom-Jin Park*

A New Modeling and Delay Analysis of IEEE 802.11 Distributed Coordination Function, *Fan Zhang, Lai Tu, Jian Zhang, Benxiong Huang*

**Session 9C: Autonomic Models and Architectures (Laurel, level 3)**

Session Chair: *Valentina Casola*

An Architecture for Self-healing Autonomous Object Groups, *Hein Meling*

A Generic and Modular System Architecture for Trustworthy, Autonomous Applications, *George Brancovici, Christian Müller-Schloer*

Cooperative Component Testing Architecture in Collaborating Network Environment, *Gaeil An, Joon S. Park*

An Approach to a Trustworthy System Architecture Using Virtualization, *Frederic Stumpf, Michael Benz, Martin Hermanowski, Claudia Eckert*

**Session 9D: Fault-tolerant Systems (Cypress, level 3)**

Session Chair: *Shane Balfé*

Schedulability Analysis of the Fault-Tolerant Hard Real-Time Tasks with Limited Priority Levels, *Jun Li, Fumin Yang, Gang Tu, Wanhua Cao, Yansheng Lu*

A Property-Based Technique for Tolerating Faults in Bloom Filters for Deep Packet Inspection, *Yoon-Hwa Choi, Myeong-Hyeon Lee*

A Fuzzy Logic Approach for Secure and Fault Tolerant Grid Job Scheduling, *Congfeng Jiang, Cheng Wang, Xiaohu Liu, Yinghui Zhao*

An Enhanced DGIDE Platform for Intrusion Detection, *Fang-Yie Leu, Fuu-Cheng Jiang, Ming-Chang Li, Jia-Chun Lin*

**July 14 (Saturday)**

**08:15–18:30 Tour to Macau**

## **UIC-ATC Joint Panel**

### **Future Trends of Ubiquitous and Autonomic Computing**

**Chair:** Prof. [Stephen S. Yau](#), Arizona State University, USA  
**Panelists:** Prof. [Christian Müller-Schloer](#), University of Hanover, Germany  
Prof. [Jiannong Cao](#), Hong Kong Polytechnic University, China  
Prof. [Jadwiga Indulska](#), University of Queensland, Australia  
**Discussants:** Prof. [Tosiyasu L. Kunii](#), Kanazawa Institute of Technology, Japan  
Prof. [Hartmut Schmeck](#), Karlsruhe Institute of Technology, Germany

Ubiquitous computing with extensive networking infrastructure and various types of information and processing technologies is promising to achieve a smart world (SW), in which computational intelligence is distributed throughout the physical environment to provide trustworthy and relevant services to people. Such computing systems, including hardware, software, communication and networks, are growing rapidly with an ever increasing scale and heterogeneity. To cope with such complexity and various QoS requirements, both ubiquitous and autonomic computing capabilities are needed. While ubiquitous computing environments enable “anytime, anywhere” computing, the capability of self-management enabled by autonomic computing maximizes the efficiency and reliability of computing systems without human intervention or guidance.

In this panel, after introductory remarks (**Prof. Yau**), the three panelists will present their position statements on the future trends of ubiquitous and autonomous computing with the emphasis on the following aspects:

#### **1. Ubiquitous intelligent objects**

Ubiquitous computing environments consist of heterogeneous mobile computing devices, which are required to be intelligent and self-manageable. Much progress has been made for such ubiquitous intelligent objects, which may be electronic labels/tags, RFIDs, MEMS devices, tiny sensors, and embedded software and agents, etc. What will be the future trends of these objects in terms of their capability, usability and dependability? (**Prof. Cao**).

#### **2. Controllability of self-organized systems**

Future ubiquitous computing systems will consist of a large number of heterogeneous and autonomous elements and subsystems. Due to the dynamic nature of the behaviors and characteristics of those elements and subsystems, we need to design principles and architectures which enable these systems to be self-manageable. The elements and subsystems should be able to acquire the current situation of the entire system, and adjust their behaviors accordingly. It will be the responsibility of the system designers to make sure that the global objectives are translated to local goals, and that the system stays within predefined borders of state space. What will be the appropriate system architectures, which mechanisms are needed to enable flexible behavior without running out of control, and how can we keep control without stifling the creativity of self-organizing systems?. (**Prof. Muller-Schloer**)

#### **3. Services and applications in ubiquitous and autonomic computing**

The purpose of ubiquitous and autonomic computing environments is to enable the “anytime, anywhere” computing capabilities of users. Such environments should be able to incorporate heterogeneous services and applications. Substantial research has been done on the development of trustworthy grid/p2p services, pervasive context-aware and mobile services. The integration of such services and applications into ubiquitous and autonomic computing environments require techniques from various layers in the system architecture. What are the major challenges in developing mobile services in context-aware ubiquitous computing environments? (Prof. Indulska)

Systems in ubiquitous and autonomic computing environments are susceptible to malicious attacks, and hence all the systems, services and applications in such environments need to be trustworthy. Following the position statements of the three panelists, the two discussants (**Prof. Kunii** and **Prof. Schmeck**) will lead the discussions, including the issues related to the trust of these systems. The discussions will also be open to the floor.

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