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

### July 10 (Tuesday)

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>13:00-18:00</td>
<td>Registration (Pre-function area)</td>
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### July 11 (Wednesday)

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<th>Time</th>
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<tr>
<td>08:00-18:00</td>
<td>Registration (Pre-function area)</td>
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<tr>
<td>08:30-08:45</td>
<td>Opening Ceremony (The Four Seasons Suites)</td>
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<tr>
<td>08:45-09:45</td>
<td>Keynote 1 (The Four Seasons Suites 1-4, level 2): Autonomic and Trusted Computing for Ubiquitous Intelligence, Tosiyasu L. Kunii</td>
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<tr>
<td>9:45-10:15</td>
<td>Coffee Break (Pre-function Area, The Four Seasons Suites 1-4, level 2)</td>
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</tbody>
</table>
| 10:15-13:00 | Session 1A (Rosewood, level 3): Intelligent Computing: Models and Services I  
Session 1B (Poplar, level 3): Smart Objects and Embedded Systems I  
Session 1C (Laurel, level 3): Context-aware Applications  
Session 1D (Cypress, level 3): Cryptography and Signatures |
| 13:00-14:00 | Lunch (The Four Seasons Suites 1-4, level 2)                        |
| 14:00-16:00 | Session 2A (Rosewood, level 3): Smart Spaces/Environments/Services I  
Session 2B (Poplar, level 3): Sensor Networks I  
Session 2C (Laurel, level 3): Ad-hoc and Intelligent Networks I  
Session 2D (Cypress, level 3): Autonomic Computing and Services |
| 16:00-16:30 | Coffee Break (Pre-function area, level 3)                           |
| 16:30-18:00 | Session 3A (Rosewood, level 3): Intelligent Computing: Models and Services II  
Session 3B (Poplar, level 3): Service Oriented Middleware and Applications I  
Session 3C (Laurel, level 3): Secure and Trusted Computing  
Session 3D (Cypress, level 3): Secured Services and Applications |
| 18:00-20:00 | Cocktail Reception (The Piano Corner, level 3)                       |

### July 12 (Thursday)

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<tr>
<th>Time</th>
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<tr>
<td>08:30-09:30</td>
<td>Keynote 2 (The Four Seasons Suites 1-4, level 2): Remarks on Self-organisation and Trust in Organic Computing Systems, Hartmut Schmeck</td>
</tr>
<tr>
<td>09:30-10:30</td>
<td>Keynote 3 (The Four Seasons Suites 1-4, level 2): An Intelligent Home System as a Development and Test Platform for Ubiquitous Computing, Keith C.C. Chan</td>
</tr>
<tr>
<td>10:30-11:00</td>
<td>Coffee Break (Pre-function Area, The Four Seasons Suites 1-4, level 2)</td>
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| 11:00-13:00 | Session 4A (Rosewood, level 3): Pervasive Communication and Mobile Systems I  
Session 4B (Poplar, level 3): Sensor Networks II  
Session 4C (Laurel, level 3): Security, Safety and Privacy I  
Session 4D (Cypress, level 3): Trusted Models and Systems |
| 13:00-14:00 | Lunch (The Four Seasons Suites 1-4, level 2)                        |
| 14:00-16:00 | Session 5A (Rosewood, level 3): Smart Spaces/Environments/Services II  
Session 5B (Poplar, level 3): Sensor Networks III  
Session 5C (Laurel, level 3): Ad-hoc and Intelligent Networks II  
Session 5D (Cypress, level 3): Intrusion Detection |
| 16:00-16:30 | Coffee Break (Pre-function area, level 3)                           |
| 16:30-18:00 | Panel Discussion (Poplar and Laurel, level 3)                       |
| 18:00-21:00 | Banquet (Gather at level 3 at 18:00)                                |
### July 13 (Friday)

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<td>13:00-14:00</td>
<td>Lunch (The Four Seasons Suites 1-4, level 2)</td>
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<td>14:00-16:00</td>
<td>Session 8A (Rosewood, level 3): Security, Safety and Privacy II</td>
<td>Session 8B (Poplar, level 3): Sensor Networks VI</td>
<td>Session 8C (Laurel, level 3): Key Management</td>
<td>Session 8D (Cypress, level 3): Worm Detection and Data Security</td>
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<td>16:00-16:30</td>
<td>Coffee Break (Pre-function area, level 3)</td>
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### July 14 (Saturday)

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**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.


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

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 fur 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/cskcchan.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, Tosiyasu 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 Agent Platform for Ubiquitous Computing, Ji Hoon Kim, Seungwon 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, Seungshak Rhee, Jongan Park, Jonghun Chun
Q+-Algorithm: An Enhanced RFID Tag Collision Arbitration Algorithm, Donghwan Lee, Kyungkyu Kim, Wonjun Lee
Surface-embedded Passive RF Exterocpection: Kepler, Greed, and Buffon’s Needle, Vladimir Kulyakin, Alaisgar Kutyawanwala, 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 Papadopoulou, Dimitris Plexousakis
Devising a Context Selection-Based Reasoning Engine for Context-Aware Ubiquitous Computing Middleware, Donghai Guan, Weiwei Yuan, Seongjin Cho, Andrey Gavrilo, 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, Liuni Yao, 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, Chunning 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, Desqin Zou, Jieyuan 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 Heterogeneous 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 Dihys 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-II Hwang, Tea-Young Kim, Doo-Scop Eom


An Efficient Bi-Directional Flooding in Wireless Sensor Networks, Woosuk Cha, Eun-Mi Kim, Bae-Ho Lee, Gilwan 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-Sea Kim

Mobility Tracking for Mobile Ad Hoc Networks, Hui Xu, Min Meng, Jinsang Cho, Brian J. d’Auria, 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, Uhijn 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 Rivell

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, Ilja 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 Yamana, 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, Jinh-Yuk 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

A Context-Aware Service Composition for Mobile Network Environments, Choohnwa Lee, Wonjun Lee, Sunghoon Ko, Seunjae 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 Balfie, Anish Mohammed
An Efficient and Secure Rights Sharing Method for DRM System Against Replay Attack, Donghyun Choi, Yunho Lee, Hogah 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, Yuechi 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)**

08:00–08:30 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 Schneck

09:00–10:30 Keynote 3 (The Four Seasons Suites 1-4, level 2)
*Chair: Jiannong 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, Hyemeek Park, Moonseong Kim, Hyunseung Choo
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 Kang, 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 Ohashi, Tomohiro Kokogawa, Tadanori Mizuno
Directed Diffusion Based on Link-Stabilizing Clustering for Wireless Sensor Networks, Zade 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, Lilun Chen, Daoru Chen, Li Xie

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

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 Gounopoulos, Achilles Kameas, Brendan Oflynn

Session 5B: Sensor Networks III (Poplar, level 3)
Session Chair: Kenichi Takahashi


A Location-Unaware Connected Coverage Protocol in Wireless Sensor Networks, Yingchi Mao, Zhouming 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, Shion-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 Chiuhcheng 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 Horii, 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 Recordings, Sung-Kyung Kim, Dong-Guk Han, Ho Won Kim, Kyo Il Chung, Jongjin 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, Jiaye Shin

Bridging OSGi Islands through SLP Protocol, Choohwa Lee, Jongkyu Yi, Wonjun Lee


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 Ouayng, 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, Eun-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, Yaoxue Zhang, Pengwei Tian, Yuezhi Zhou, Cunhao Fang
BASCA: A Business Area-Oriented Service Component Adaptation Approach Suitable for Ubiquitous Environment, Pengwei Tian, Yaoxue 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, Yonghee Choi, Junkai Huang, Weiping Liu
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, Seiie 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
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, Shyiti Chen, Yingyou Wen, Hong Zhao
Calculating Trust Using Aggregation Rules in Social Networks, Sanguk Noh
Enhancing Grid Security Using Trusted Virtualization, Hans Löhr, Haris Govind V. Ramasamy, Ahmad-Reza Sadeghi, Stefan Schulz, Matthias Schunter, Christian Stible
A Wearable System for Outdoor Running Workout State Recognition and Course Provision, Katsuriko Takata, Masataka Tanaka, Jianhua Ma, Runhe Huang, Bernady O. Apduhan, 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 Muñoz, Antonio Muñoz, Daniel Serrano
Improved Cryptanalysis of Three Remote User Authentication Schemes Using Smart Cards, Raphael C.W. Phan, Bok-Min Goh
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, Hoek Beng Lim
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 Kyoungh 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 Ryu, Sungik Jun
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, Huangguo Zhang
A Distributed Self-healing Data Store, Wolfgang Trumler, Jörg Ehrg, Andreas Pietzowski, Benjamin Satzger, Theo Ungerer
Malicious Codes Detection Based on Ensemble Learning, Boyan Zhang, Jianping Yin, Jingbo Hao, Dingsxing 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, Lanlian 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 Sjölund
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, Zhenguo 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

Session 9D: Fault-tolerant Systems (Cypress, level 3)
Session Chair: Shane Balfe
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
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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<thead>
<tr>
<th>Name</th>
<th>Institution</th>
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<tbody>
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<td>S. Masoud Sadjadi</td>
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<td>Albert Zomaya</td>
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