The International Conference on Information Networking 2013 (ICOIN 2013)

Conference Program

27-30 January 2013
Chatrium Hotel Reverside Bangkok, Bangkok, Thailand

Technically Co-sponsored by

IEEE, IEEE Computer Society, IEICE, Korean Institute of Information Scientists and Engineers
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  Kyung-Joon Park  DGIST, Korea
  Suwon Park  Kyung Hee University, Korea
  Md. Abdur Razzaque  Instituto de Telecomunicações, University of Beira Interior, Portugal
  Hiroo Sekiya  Chiba University, Japan
  Shigeki Shiokawa  Kanagawa Institute of Technology, Japan
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  Lei Wang  Dalian University of Technology, China
  Xuetao Wei  UC, Riverside, USA
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  Yulei Wu  Chinese Academy of Sciences, China
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Greetings

Message from the General Co-Chairs

Welcome to ICOIN 2013, the 27th International Conference on Information Networking 2013 on 27 – 30 January in Bangkok, Thailand. It is our pleasure to welcome all of the attendees, authors, invited speakers, and guests.

ICOIN 2013 is sponsored by KIISE, Korean Institute of Information Scientists and Engineers, and technically co-sponsored by IEEE Computer Society and IEICE Communications Society. As in the past, we have received a large volume of high-quality submissions, an indicator of ICOIN’s position as a prestigious international conference. We hope you will have a chance to take part in 15 technical sessions including two poster sessions about Sensor Networks, Mobile Networks, Cognitive Radio and Wireless Networks, Wireless Communications, Network Security, Internet, Applications and Service Management, Wireless Networking, QoS and Resource Management, Cloud Computing, Mesh Networking and so on.

We have also invited a distinguished keynote speaker and hosted two valuable tutorial speakers who will give us lectures about Participatory Sensing and Markov Chain Modeling.

We hope you enjoy the world premier networking conference in our profession and wish this conference will be an opportunity to share the current hot research trends among the high value researchers from around the world.

We are also quite blessed to have a strong Executive Committee, who each have enthusiastically provided their expertise and support. We would like to thank each one of them for their contribution.

Bangkok, the capital city of Thailand, is one of the world's top tourist destination cities with multi-faceted sights, attractions and city life. We hope you to experience the rich heritage of Thailand and the exotic city life and find a uniqueness of its customs.

We are sure you will truly enjoy this conference and wish you a memorable stay!

General Co-Chairs,

Sanghyun Ahn
Ilyoung Chong
Panjai Tantatsanawong
Greetings

Message from the Technical Program Committee Co-Chairss

It is our great pleasure to welcome you to ICOIN 2013, the 27th International Conference on Information Networking (ICOIN). ICOIN is a conference covering broad aspects of computer communications, wireless/mobile networks, and converged networks in the theoretical and practical aspects.

This year we received 294 papers from 31 different countries. Through a rigorous review process, we finally accepted 128 papers for the presentation at the ICOIN 2013, where 67 of them were selected for oral presentation, and 61 for poster presentation. Almost all of the submitted papers received at least three independent reviews, which involved 66 TPC members, with the support of additional reviewers around the world. We also selected two outstanding papers for the Best Paper Award.

The technical program is organized into 13 oral presentation sessions which are held in two tracks, and two poster sessions as well as a keynote and two tutorials. While the program covers a variety of topics on wireless and wired communications and networking technologies, this year we made an effort to reflect the growing interests in future networks and to extend our interest to network applications / service area.

We would like to express sincere thanks to the authors from all over the world for their prominent contributions. In addition to the authors, we are very thankful to all the TPC members, and external reviewers. We believe that the precious and interesting program of this year is made possible by their valuable time and commitment for timeliness of the review process and the organization of technical program. We would also like to thank our sponsors, KIISE, IEEE Computer Society, and IEICE Communications Society for their supports of this successful event. We extend our sincere thanks to the General Co-Chairs, Prof. Sanghyun Ahn, Prof. Ilyoung Chong, and Prof. Panjai Tantatsanawong, and the other members of the organizing committee for facilitating various aspects of our work.

We hope that you enjoy the program of ICOIN 2013 and have a great time in Bangkok. We also look forward to your continued participation in future ICOIN conferences.

TPC Co-Chairs,

Meejeong Lee  
Motonori Nakamura  
Sinchai Kamolphiwong
# ICOIN 2013 Program at a Glance

<table>
<thead>
<tr>
<th>TIME</th>
<th>Track 1</th>
<th>Track 2</th>
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<tbody>
<tr>
<td><strong>January 27, 2013 (Sunday)</strong></td>
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<tr>
<td>16:00-17:00</td>
<td>Welcome Meeting (Ravipa 3&amp;4)</td>
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<tr>
<td><strong>January 28, 2013 (Monday)</strong></td>
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<tr>
<td>08:30-</td>
<td>Registration Open</td>
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<tr>
<td>09:00-10:00</td>
<td>Tutorial I (Chatrium Ballroom)</td>
<td>Sensor Networks (1B) (Ravipa 1&amp;2)</td>
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<tr>
<td>10:00-10:15</td>
<td>Coffee Break</td>
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<tr>
<td>10:15-11:15</td>
<td>Tutorial II (Chatrium Ballroom)</td>
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<tr>
<td>11:15-11:30</td>
<td>Coffee Break</td>
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<tr>
<td>11:30-12:30</td>
<td>Opening/Welcome Address and Keynote Speech (Chatrium Ballroom)</td>
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<tr>
<td>12:30-13:30</td>
<td>Lunch</td>
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<tr>
<td>13:30-15:30</td>
<td>Network Security (1A) (Chatrium Ballroom)</td>
<td>Sensor Networks (1B) (Ravipa 1&amp;2)</td>
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<tr>
<td>15:30-15:45</td>
<td>Coffee Break</td>
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<tr>
<td>15:45-17:45</td>
<td>Routing, Switching and Addressing (2A) (Chatrium Ballroom)</td>
<td>Mobile Networks (2B) (Ravipa 1&amp;2)</td>
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<tr>
<td><strong>January 29, 2013 (Tuesday)</strong></td>
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<tr>
<td>08:30-</td>
<td>Registration Open</td>
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<tr>
<td>09:00-11:00</td>
<td>Implementation, Measurement and Performance Analysis (3A) (Chatrium Ballroom)</td>
<td>Cognitive Radio and Wireless Networks (3B) (Ravipa 1&amp;2)</td>
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<tr>
<td>11:00-11:15</td>
<td>Coffee Break</td>
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<tr>
<td>11:15-12:15</td>
<td>Mesh Networking (4A) (Chatrium Ballroom)</td>
<td>Wireless Networking (4B) (Ravipa 1&amp;2)</td>
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<tr>
<td>12:15-13:15</td>
<td>Lunch</td>
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<tr>
<td>13:15-15:15</td>
<td>Cloud Computing (5A) (Chatrium Ballroom)</td>
<td>Wireless Communications I (5B) (Ravipa 1&amp;2)</td>
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<tr>
<td>15:15-15:30</td>
<td>Coffee Break</td>
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<tr>
<td>15:30-17:30</td>
<td>Internet, Applications and Service Management (6A) (Chatrium Ballroom)</td>
<td>Wireless Communications II (6B) (Ravipa 1&amp;2)</td>
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<tr>
<td>18:00-20:00</td>
<td>Banquet</td>
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<td><strong>January 30, 2013 (Wednesday)</strong></td>
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<tr>
<td>09:00-</td>
<td>Registration Open</td>
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<tr>
<td>09:30-10:30</td>
<td>Poster Session I (Chatrium Ballroom)</td>
<td>QoS and Resource Management (7B) (Ravipa 1&amp;2)</td>
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<tr>
<td>10:30-11:00</td>
<td>Coffee Break</td>
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<tr>
<td>11:00-11:30</td>
<td>Poster Session II (Chatrium Ballroom)</td>
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<tr>
<td>11:30-12:00</td>
<td>Lunch</td>
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<tr>
<td>12:00-13:00</td>
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Tutorial I: Spectrum Sharing and Aggregate Interference in Wireless Networks
Speaker: Prof. Seong-Lyun Kim, Yonsei University, Korea

Abstract:
In wireless networks, efficient spectrum sharing is vital for maximizing the area capacity, in which the key concern is how to control co-channel interference in a parallel and distributive way. One can think of commercially successful examples of such; for example, iterative power control in cellular radio, random access protocols in wireless LAN, etc. With the recent development of wireless networks, however, the task becomes even more challenging. From the perspective of the cellular radio, the size of the cells continuously shrinks (small cells combined with HetNet), making the base station (BS) density significantly high in 3-dimensional space. A question is how the cell area capacity scales with the BS density or how much the cell should be small to achieve a given SIR target. Turning our attention to the Wi-Fi (CSMA/CA) network, we have questioned on quantifying the aggregate interference to a specific receiver, in order to tune MAC parameters. In the cognitive radio system, spectrum sharing is done between the primary- and the secondary networks, where we provide a prescribed protection level to the primary systems (such as TV receivers). The main focus of this talk is to provide engineering insights into above issues. In particular, some results of the European FP7 project, QUASAR will be shared with the audience.

Short Biography
Dr. Seong-Lyun Kim is a Professor of wireless networks at the School of Electrical & Electronic Engineering, Yonsei University, Seoul, Korea. He was an Assistant Professor of Radio Communication Systems at the Department of Signals, Sensors & Systems, Royal Institute of Technology (KTH), Stockholm, Sweden. He was a Visiting Professor at the Control Group, Helsinki University of Technology (now Aalto University), Finland, and the KTH Center for Wireless Systems, Sweden. He has been a technical program committee member or a chair for various conferences, and an editorial board member of IEEE Transactions on Vehicular Technology, IEEE Communications Letters and Journal of Communications and Network. He has recently served as the leading organizer of IEEE Wireless Communications and IEEE Network for wireless communications in networking robotics. His research interest includes radio resource management and information theory in wireless networks, economics of wireless systems, and robotic networks. He published numerous papers, including the co-authored book (with Prof. Jens Zander), Radio Resource Management for Wireless Networks. His degrees include BS in economics (Seoul National University), and MS & PhD in operations research (with application to wireless networks, Korea Advanced Institute of Science & Technology).

Tutorial II: Participatory Sensing: Crowdsourcing Data from Mobile Smartphones in Urban Spaces
Speaker: Prof. Salil Kanhere, University of New South Wales

Abstract:
The recent wave of sensor-rich, Internet-enabled, smart mobile devices such as the Apple iPhone has opened the door for a novel paradigm for monitoring the urban landscape known as participatory sensing. Using this paradigm, ordinary citizens can collect multi-modal data streams (e.g., audio, video, sound, location coordinates, etc.) from the surrounding environment using their mobile devices and share the same using existing communication infrastructure (e.g., 3G service or Wi-Fi access points). The data contributed from multiple participants can be combined to build a spatiotemporal view of the phenomenon of interest and also to extract important community statistics. Given the ubiquity of mobile phones and the high density of people in metropolitan areas, participatory sensing can achieve an unprecedented level of coverage in both space and time for observing events of interest in urban spaces. This tutorial will provide a comprehensive overview of this exciting new sensing paradigm and discuss the associated research challenges in the context of a participatory noise pollution monitoring application called Ear-Phone. We will present interesting insights from our experiences in designing and implementing this system. Extensive simulations and outdoor experiments demonstrate the feasibility of using participatory sensing to assess noise pollution.

Short Biography
Dr. Salil Kanhere received his M.S. and Ph.D. degrees, both in Electrical Engineering from Drexel University, Philadelphia in 2001 and 2003, respectively. He is currently an Associate Professor in the School of Computer Science and Engineering at the University of New South Wales in Sydney, Australia. His current research interests include pervasive computing, participatory sensing, mobile networking, sensor networks and security. He has published over 90 peer-reviewed articles on these research topics. He has served on the organizing committee of a number of IEEE and ACM international conferences (e.g., ACM SenSys, IEEE LCN, ACM MSWiM, IEEE SenseApp, ACM IWCMC). He is active on the program committee of numerous well-known conferences (e.g., IEEE LCN, IEEE DCOSS, IEEE ICC, IEEE GLOBECOM, IEEE WCNC, etc.). He currently serves as the Area Editor for the ICST Journal on Ubiquitous Environments and the Transactions on Emerging Telecommunication Technologies. He is a Senior Member of both the IEEE and the ACM.
Keynote Speech

January 28, 2013 (Monday)

11:30-12:30

Keynote Speech Chair: Hyukjoon Lee (Kwangwoon University, Korea)

Keynote Speech: Towards WiFi Services using TV White Space

Keynote speaker: Prof. Choongseon Hong, Kyung Hee University

Abstract:
Recently data explosion occurs in the Internet world by increasing the mobile devices. Therefore we need to have more spectrum avoiding the clogging of mobile services. One of the solutions is to use the white spaces. A white space device uses gaps in radio spectrum, called ‘white spaces’, which exist in between frequency bands that have been reserved for TV broadcasting. Use of these white spaces as the unlicensed band would allow devices to transmit and receive wireless signals for applications such as broadband access for rural communities or innovative ‘machine-to-machine’ network. This speech discusses on the environments of the use of current mobile Internet and how to boost the capacity for off-loading Internet traffic. Also, the activities in IEEE and IETF are introduced. Strategies of TV white space in US, EU, etc. then, explained. Finally the keynote discusses the use case of WiFi services using TV White Spaces and the research topics on white space.

Short Biography

Choong Seon Hong received his B.S. and M.S. degrees in Electronic Engineering from Kyung Hee University, Seoul, Korea, in 1983 and 1985, respectively. In 1988, he joined KT, where he worked on Broadband Networks as a Member of the technical staff. From Sept. 1993, he joined Keio University, Japan. He received the Ph.D. degree at Keio University in March 1997. He had worked for the Telecommunications Network Lab. KT as a Senior Member of technical staff and as a Director of the networking research team until August 1999. Since September 1999, he has worked as a Professor of the Department of Computer Engineering, Kyung Hee University. He is now associate technical editor of IEEE Communication Magazine, associate editors of IEEE Transactions on Services and Networks Management, Journal of Communications and Networks, and International Journal of Network Management. And he has served as a Program Committee Member and an Organizing Committee Member for International conferences such as NOMS, IM, APNOMS, E2EMON, CCNC, ADSN, ICPP, DIM, WISA, BeN, TINA, SAINT, and ICOIN. His research interests include ad hoc networks, power line communications, network management, and future Internet. He is a Senior Member of IEEE and Member of ACM, IEICE, IPSJ, KIIE, KICS, and KIPS.
January 28, 2013 (Monday)
13:30 – 15:30

Session 1A
Network Security
Chair: Reijo Savola, VTT Technical Research Centre of Finland, Finland

[1A-1] Network Intrusion Detection with Fuzzy Genetic Algorithm for Unknown Attacks
Pawita Jongsuebsuk (King Mongkut’s University of Technology Thonburi, Thailand), Naresuan Wattanapongsakorn (King Mongkut’s University of Technology Thonburi, Thailand), Charlempol Charnsripinyo (National Electronics and Computer Technology Center, Thailand)

Sayonnha Mandal (University of Oklahoma, USA), Gregory Macdonald (University of Oklahoma, USA), Mayssaa El Rifai (The University of Oklahoma, USA), Nikhil Panekar (University of Oklahoma, USA), Farnaz Zamani (University of Oklahoma, USA), Yuhua Chen (University of Oklahoma, USA), Subhash Kak (Oklahoma State University, USA), Pramode K. Verma (The University of Oklahoma, USA), Robert C. Hark (University of Oklahoma, USA), James Shass (The University of Oklahoma, USA)

Satoru Shimosaka (Tokyo University of Agriculture and Technology, Japan), Kenta Umebayashi (Tokyo University of Agriculture and Technology, Japan), Yasuo Suzuki (Tokyo University of Agriculture and Technology, Japan)

[1A-4] An Enhanced Measurement Transmission Scheme for Privacy Protection in Smart Grid
Shi Li (Ewha Womans University, Korea), Kyung Choi (Ewha Womans University, Korea), Kijoon Chae (Ewha Womans University, Korea)

[1A-5] A Holistic Immune System Against Active P2P Worms
Eng Keong Lua (Monash University, Australia), Ruiuchuan Chen (Bell Labs, Alcatel-Lucent, Germany)

[1A-6] Detecting Protected Links to Keep Reachability to Server against Failures
Koji Imagawa (Kwansei Gakuin University, Japan), Hiroyoshi Miwa (Kwansei Gakuin University, Japan)

Session 1B
Sensor Networks
Chair: Sookyoung Lee, Ewha Womans University, Korea

Sookyoung Lee (Ewha Womans University, Korea), Meejeong Lee (Ewha Womans University, Korea)

[1B-2] Movement Path Estimation for Multiple Humans in a Room Using Binary Infrared Sensors
Takashi Nakagawa (The University of Aizu, Japan), Toshiaki Miyazaki (The University of Aizu, Japan)

[1B-3] Latency Aware Broadcast Scheduling in Duty Cycle Wireless Sensor Network
Duc Tai Le (Sungkyunkwan University, Korea), Thang Le Duc (Sungkyunkwan University, Korea), Vzacheslav V. Zalyubovskiy (Sobolev Institute of Mathematics, RU), Hyunseong Cho (Sungkyunkwan University, Korea)

[1B-4] Information Discovery in Multidimensional Wireless Sensor Networks
Menik Tissera (Deakin University, Australia), Robin Doss (Deakin University, Australia), Gang Li (Deakin University, Australia), Lynn M Batten (Deakin University, Australia)

Noureddine A. Boudriga (University of Carthage, Tunisia), Inmedine Ben Abid (University of Carthage, Tunisia)

[1B-6] Improved DOA Estimation of Correlated Signals in Correlated Antenna Noises Environment
Ill-Keun Rhee (Hannam University, Korea), Hee-Soo Kim (Hannam University, Korea)

15:45 – 17:45

Session 2A
Routing, Switching and Addressing
Chair: Eng Keong Lua, Monash University, Australia

[2A-1] Potential Based Routing in B-P2i- Architecture
Mehgan Li (Tsinghua University, China), Xiaoping Zhang (Tsinghua University, China), Yaping Tian (Tsinghua University, China), Haixiang Zhang (Tsinghua University, China)

Yang Han (Waseda University, Japan), Keiichi Koyanagi (Waseda University, Japan), Takeshi Ishiya (Tokyo University of Science, Suwa, Japan), Tadashi Miyosawa (Tokyo University of Science, Suwa, Japan), Hiroo Hirsobe (Tokyo University of Science, Suwa, Japan)

Soo-Hoon Moon (Yonsei University, Korea), Seung-Jae Han (Yonsei University, Korea), Sunju Park (Yonsei University, Korea)

Hyochun Ahn (Ajou University, Korea), Youn Seo (Ajou University, Korea), Jaebeom Kim (Ajou University, Korea), Young-Bae Ko (Ajou University, Korea), Cheolhyo Lee (Electronics and Telecommunications Research Institute, Korea), Chang-Joo Kim (Electronics and Telecommunications Research Institute, Korea)

Sebastian Schellenberg (Ilmenau University of Technology, Germany), Peggy Begerow (Ilmenau University of Technology, Germany), Markus Hager (Ilmenau University of Technology, Germany), Jochen Seitz (Ilmenau University of Technology, Germany), Thomas Finke (Heilbronn University, Germany), Juergen Schroeder (Heilbronn University, Germany)
Session 2B  
Mobile Networks  
Chair: Robin Doss, Deakin University, Australia

[2B-1] Stable Multicast Trees Based on Ant Colony Optimization for Vehicular Ad Hoc Networks  
Alisson Souza (State University of Ceará, Brazil), Joaquim Celestino Júnior (State University of Ceará, Brazil), Felipe Xavier (State University of Ceará, Brazil), Francisco D Oliveira (State University of Ceará, Brazil), Ahmed Patel (Universiti Kebangsaan Malaysia, Malaysia), Maryam Latifi (Universiti Kebangsaan Malaysia, Malaysia)

Ji-In Kim (Kyungpook National University, Korea), Seok-Joo Koh (Kyungpook National University, Korea)

[2B-3] Real-time Traffic Control for Multihomed Devices  
Tapio Frantti (Renesas Mobile Europe Ltd., Finland), Mikko Majanen (VTT Technical Research Centre of Finland, Finland)

Nicholas Kataekeka (University of Cape Town, South Africa), Neco Ventura (University of Cape Town, South Africa)

[2B-5] PMIPv6-based Make-before-break Handover for Real-time Services in 3GPPs Evolved Packet Core  
Charna John (University of Cape Town, South Africa), Sibonelo Madlopha (University of Cape Town, South Africa), Neco Ventura (University of Cape Town, South Africa)

[2B-6] Service Engagement Model for Mobile Advertising Based on User Behavior  
Arto Kaasinen (Soosmyung Women’s University, Korea), Yong-Ik Yoon (Soosmyung Women’s University, Korea)

Session 3A  
Implementation, Measurement and Performance Analysis  
Chair: Tapio Frantti, Renesas Mobile Europe (RME) Ltd., Finland

[3A-1] Implementation of Open Two-factor Authentication Service Applied to Virtual Private Network  
Thanh Pham (Konkuk University, Korea), Keecheon Kim (Konkuk University, Korea)

[3A-2] End-to-end Performance Analysis Based on Cross-layer Retransmission Scheme in Wireless Communication System  
Kwang-Chun Go (Ajou university, Korea), Jae-Ryong Cha (Ajou University, Korea), Seong Keun Oh (Ajou University, Korea), Jae-Hyun Kim (Ajou University, Korea)

Osamu Takada (Hitachi, Ltd., Japan), Kohta Okshima (Tokyo University of Agriculture and Technology, Japan), Matsuaki Terada (Tokyo University of Agriculture and Technology, Japan)

[3A-4] Performance Evaluation of Synchronous Distributed Wireless Network Emulator for High-speed Mobility  
Tomoaki Tsutsumi (Tokyo University of Agriculture and Technology, Japan), Minoru Koizumi (Hitachi, Ltd., Japan), Tomoichi Ebata (Hitachi, Ltd., Japan), Kohta Okshima (Tokyo University of Agriculture and Technology, Japan), Matsuaki Terada (Tokyo University of Agriculture and Technology, Japan)

Kwang-Soon Choi (Korea Electronics Technology Institute, Korea), Young Choong Park (Korea Electronics Technology Institute, Korea), Byoung-Ha Park (Korea Electronics Technology Institute, Korea), Sung-Hee Hong (Korea Electronics Technology Institute, Korea), Kwang-mo Jung (Korea Electronics Technology Institute, Korea)

Session 3B  
Cognitive Radio and Wireless Networks  
Chair: Kenta Umebayashi, Tokyo university of Agriculture and Technology, Japan

[3B-1] Optimal Network Selection Coordination in Heterogeneous Cognitive Radio Networks  
Tuan LeAnh (Kyung Hee University, Korea); Mai Van Nguyen (Kyung Hee University, Korea); Cuong T. Do (Kyung Hee University, Korea); Choong Seon Hong (Kyung Hee University, Korea); Sungwon Lee (Kyung Hee University, Korea)

[3B-2] Deterministic Time Pattern Based Channel Selection in Cognitive Radio Network  
Vishram Mishra (Nanyang Technological University, Singapore), C. T. Lau (Nanyang Technological University, Singapore), Syin Chan (Nanyang Technological University, Singapore)

Camila Barbosa (Federal University of Goiás, Brazil), Vinicius Borges (University of Coimbra, Portugal), Sand Correa (Federal University of Goiás, Brazil), Kleber V Cardoso (Federal University of Goiás, Brazil)

Do-Hoon Kim (Chungbuk National University, Korea), Heung-Gyoon Ryu (Chungbuk National University, Korea)

[3B-5] An Approach with Two-stage Mode to Detect Cache-based Side Channel Attacks  
Si Yu (Xi’an Jiaotong University, China), Xiaolin Gui (Xi’an Jiaotong University, China), Jiancai Lin (Xi’an Jiaotong University, China)

[3B-6] A Green Rate-and-power Control Transmission Scheme in Multi-carrier Base Stations  
Yao-Liang Chung (National Taipei University, Taiwan)
Technical Sessions

11:15 – 12:15
Session 4A
Mesh Networking
Chair: Aruna Jayasuriya, Central Queensland University, Australia

[4A-1] Dual-radios Hypermesh Network Based on CSMA Protocol
Nuredin Ali Salem Ahmed (Azzaytuna University, Libya), Adel Emhemmed (University of Tripoli, Libya), Khaled Elgaid (University of Glasgow, United Kingdom)

[4A-2] An Adaptive Probe Selection Mechanism for k-link Fault Diagnosis on All-optical Mesh Networks
Chi-Shih Chao (Feng Chia University, Taiwan), Szu-pei Lu (Feng Chia University, Taiwan)

[4A-3] Requirements of Secure WSN-MCN Edge Router
Tapio Frantti (Renesas Mobile Europe Ltd., Finland), Hannu Hietalahti (Renesas Mobile Europe Ltd., Finland), Reijo M. Savola (VTT Technical Research Centre of Finland, Finland)

Session 4B
Wireless Networking
Chair: Jyri Rajamaki, Laurea University of Applied Sciences, Finland

[4B-1] A Cooperative TDMA MAC Protocol Using Dynamic Slot Assignment Scheme
Jongkwan Lee (Ajou University, Korea), Hong-Jun Noh (Ajou University, Korea), Jaesung Lim (Ajou University, Korea)

[4B-2] Border Surveillance Using Sensor Based Thick-lines
Ramzi Bellazreg (Communication Networks and Security Research Lab, SUP’COM, Tunisia), Noureddine A. Boudriga (University of Carthage, Tunisia), Sunshin An (Korea University, Korea)

13:15 – 15:15
Session 5A
Cloud Computing
Chair: Ha Jin, Huazhong University of Science and Technology, China

Dazhi Wei (National Ilan University, Taiwan), Wei-Tsong Lee (Tamkang University, Taiwan), Jiuh-Siang Huang (Tamkang University, Taiwan), Ching-Chien Wang (Tamkang University, Taiwan), Tzu-Wen Suen (Chia Nan University of Science and Technology, Taiwan)

Miroslav Urban (Slovak Academy of Sciences, Slovakia), Viet Tran (Slovak Academy of Sciences, Slovakia), Ladislav Hluchy (Slovak Academy of Sciences, Slovakia)

Pham Phuoc Hung (Kyung Hee University, Korea), Eui Nam Huh (Kyung Hee University, Korea), Tuan-Anh Bui (Hanoi University, Vietnam)

Masakuni Ishii (Nippon Telegraph and Telephone Corporation, Japan), Junghyu Han (NTT Software Innovation Center, Japan), Hiroyuki Makino (NTT Software Innovation Center, Japan)

Jin-A Hong (Kyonggi University, Korea), Sangmin Seo (Kyonggi University, Korea), Byoung-Dai Lee (Kyonggi University, Korea)

Session 5B
Wireless Communications I
Chair: Hideaki Matsue, Tokyo University of Science, Japan

[5B-1] A Study on Switching Symbol Timing Detection Method for Continuous OFDM Signals
Kenko Ota (Nippon Institute of Technology, Japan), Kohei Miyasaka (Tokyo University of Science, Suwa, Japan), Takaharu Nagahashi (Tokyo University of Science, Suwa, Japan), Yoshi Nagami (Systec Research Inc., Japan), Shinichi Tada (Systec Research Inc., Japan), Hideaki Matsue (Tokyo University of Science, Japan)

[5B-2] Alternate Time-switched Multiplexed Space-time Block Coding Technique for Single-carrier Modulation
Hyeok Koo Jung (Hanbat National University, Korea)

[5B-3] A Study on Detection Method of Same Spreading Code Signals by Multimodulus Algorithm
Genichiro Murata (Tokyo University Agriculture and Technology, Japan), Kenta Umebayashi (Tokyo University of Agriculture and Technology, Japan), Yasuo Suzuki (Tokyo University of Agriculture and Technology, Japan)

[5B-4] Design of Modified Sierpinski Fractal Based Miniaturized Patch Antenna
Sika Shrestha (Chosun University, Korea), Seung-Jo Han (Chosun University, Korea), Sun-Kuk Noh (HONAM University, Korea), Sunwoong Kim (Chosun University, Korea), Hyeon-Bai Kim (Chosun University, Korea), Dong-You Choi (Chosun University, Korea)

[5B-5] Cooperation Through Secondary Relaying in TDMA Cellular Networks
Young Ju Hwang (Yonsei University, Korea), Seong-Lyun Kim (Yonsei University, Korea)

[5B-6] A Distributed Quasi-orthogonal Space Time Block Code for Cooperative Communication with Information Exchange Errors for Decode-and-forward Relay Networks
Shu-Ming Tseng (National Taipei University of Technology, Taiwan), Yueh-Teng Hsu (Lite-on Technology Corp., Taiwan), Shiou-Cheng Ren (National Taipei University of Technology, Taiwan)
2013

Technical Sessions

15:30 – 17:30

Session 6A
Internet, Applications and Service Management
Chair: Chi-Shih Chao, Feng Chia University, Taiwan

[6A-1] Inter-domain Connection of RELOAD-based Peer-to-peer Overlays
Joscha Schneider (Mannheim University of Applied Sciences, Germany), Eckhart Körner (University of Applied Sciences Mannheim, Germany), Lothar Grimm (Deutsche Telekom AG, T-Systems, Germany)

Sheng-Chang Chen (National Chiao Tung University, Taiwan), Chung-Ju Chang (National Chiao Tung University, Taiwan), Yu-Huang Chu (Chungwha Telecom Co., Ltd., Taiwan)

Adriano Fiorese (University of Coimbra, Portugal), Paulo Simões (University of Coimbra, Portugal), Fernando Boavida (University of Coimbra, Portugal)

Ho Kuen Song (Sungkyunkwan University, Korea), Kwang Myung Kim (Sungkyunkwan University, Korea), Kyung Tae Kim (Sungkyunkwan University, Korea), Hee Yong Youn (Sungkyunkwan University, Korea)

Seungoh Choi (Ajou University, Korea), Kwangsoo Kim (Ajou University, Korea), Seongmin Kim (Ajou University, Korea), Byeonghee Roh (Ajou University, Korea)

[6A-6] Contents Sharing Using PPSP in DLNA-based Networks
Hyunwoo Nam (Soongsil University, Korea), Younghan Kim (Soongsil University, Korea)

Session 6B
Wireless Communications II
Chair: Yao-Liang Chung, National Taipei University, Taiwan

[6B-1] Hybrid Spectrum Sharing in Dynamic Spectrum Access Networks
Sahari Somasekharan Nair (Ilmenau University of Technology, Germany), Sebastian Schellenberg (Ilmenau University of Technology, Germany), Mainak Chatterjee (University of Central Florida, USA)

Thant Zin Oo (Kyung Hee University, Korea), Choong Seon Hong (Kyung Hee University, Korea), Sungwon Lee (Kyung Hee University, Korea)

[6B-3] Pre- and Post- Equalization Technique Combining for Wireless Communications
Suriya Kanthalue (Dharuraj Pundit University, Thailand), Pheeradej Nanan (CAT Telecom Public Company Limited, Thailand)

[6B-4] A Threshold-based Frequency Offset Estimation Scheme for OFDM Systems
Youngsoo Lee (Sungkyunkwan University, Korea), Jaewoo Lee (Sungkyunkwan University, Korea), Youngseok Lee (Sungkyunkwan University, Korea), Jeongyoon Shin (Sungkyunkwan University, Korea), Seokho Yoon (Sungkyunkwan University, Korea)

[6B-5] An Adaptive Channel Number Tuning Mechanism on Parallel Transfer with UDT
Jongseon Park (Chonbuk National University, Korea), Dosik An (Chonbuk National University, Korea), Cho Gihwan (Chonbuk National University, Korea)

January 30, 2013 (Wednesday)

09:30 – 11:30

Session 7B
QoS and Resource Management
Chair: Vijayashree Budyal, Electronics and Communication Engineering College, India

Chang-Hwan Lee (Yeungnam University, Korea), Young-Tak Kim (Yeungnam University, Korea)

[7B-2] PACS Metric Based on Regression for Evaluating End-to-end QoS Capability over The Internet for Telemedicine
Sanon Chimmanee (Rangsit University, Thailand)

[7B-3] Transformation Based Low Complexity Algorithm for Nash Bargaining Solutions in Dynamic Networks
Eunhye Choi (Ewha Womans University, Korea), Hyunggon Park (Ewha Womans University, Korea)

[7B-4] VoIP Call Admission Control Scheme Considering VoIP On-off Patterns
JiYoung Jung (University of Chung-Ang, Korea), DongYoon Seo (University of Chung-Ang, Korea), Jung Ryan Lee (Chung-Ang University, Korea)

Yun Jae Shin (Changang University, Korea), Jung Ryun Lee (Chung-Ang University, Korea)

[7B-6] Price-based Tethering for Cooperative Networking
Jisub Lee (Korea University, Korea), Chonglung Shao (Korea University, Korea), Heejun Roh (Korea University, Korea), Wonjun Lee (Korea University, Korea)
January 30, 2013 (Wednesday)

09:30-10:30

Poster Session I
Chair: Yeongkwun Kim, Western Illinois University, USA

[P1-1] R-HWMP: Reservation-based HWMP Supporting End-to-end QoS in Wireless Mesh Networks
Whoi Jin Jung (Chungnam National University, Korea), Seok Hong Min (Chungnam National University, Korea), Bong Gyu Kim (Agency for Defense Development, Korea), Hyung Suk Choi (Agency for Defense Development, Korea), Jae Yong Lee (Chungnam National University, Korea), Byung Chul Kim (Chungnam National University, Korea)

[P1-2] Agent Driven Multi-constrained Quality of Service Anycast Routing in Mobile Ad Hoc Networks
Vijayashree Budyal (Basaveshwar Engineering College, India), Sunil Manvi (Reva Institute of Technology Bangalore, India), Sangamesh Hiremath (G. M. Institute of Technology, India)

[P1-3] Dynamic TXOP Allocation for Multimedia QoS Providing over Wireless Networks
Kwangsueng Ju (Kwangwoon University, Korea), Kwangsue Chung (Kwangwoon University, Korea)

[P1-4] Priority-based Contention Period Allocation for Directional CSMA/CA in Smart Home
Yongsun Kim (ETRI, Korea), Hoyong Kang (ETRI, Korea)

Biseon Lee (POSTECH, Korea), Hyeonmok Ko (POSTECH, Korea), Cheeha Kim (POSTECH, Korea)

[P1-6] Indoor Localization Improvement Via Adaptive RSS Fingerprinting Database
Chawatthi Kweeravong (Thammasat University, Thailand), Konwut Wiputitvarakun (Thammasat University, Thailand), Kamol Kaemarungsi (National Electronics and Computer Technology Center, Thailand)

[P1-7] Improved AOMDV to Increase Path Stability by Utilizing The Node Mobility Information in MANET
Han Park (Kyungnam University, Korea), Wawoon Kim (Kyungnam University, Korea), Sangdong Kang (Kyungnam University, Korea)

[P1-8] Weighted Bandwidth Sharing Scheme to Guarantee The Video Quality in Home Networks
Hyeongjoon Son (Kwangwoon University, Korea), Sung Chang (Korea Aerospace Institute, Korea), Jinpyo Hong (Hankuk University of Foreign Studies, Korea), Kwangsue Chung (Kwangwoon University, Korea)

[P1-9] Transmission Frame Assignment for Latency-bounded Data Delivery in WSNs
Daeil Kim (Korea University, Korea), Jung-Hyok Kwon (Korea University, Korea), Chul-Her Kang (Kwangju University, Korea), Sang-Hong Lee (KTF Corporation, Korea)

Hanan Hussein (Ain Shams University, Egypt), Hussein A. Elsayed (Ain Shams University, Egypt), Salwa Elramly (Ain Shams University, Egypt)

[P1-11] An Efficient Iterative Detection Scheme for Coded MIMO Systems
Saleem Ahmed (Chonbuk National University, Korea), Sooyoung Kim (Chonbuk National University, Korea)

Eylen E. Ozekin (Bogazici University, Turkey), Fahri Cihan Demirci (Dogus University, Turkey), Fatih Alagoz (Bogazici University, Turkey)

[P1-13] Expected Traffic Reduction by Content-oriented Incentive in Peer-assisted Content Delivery Networks
Naoya Maki (Kyoto University, Japan), Takayuki Nishio (Kyoto University, Japan), Ryoichi Shinkuma (Kyoto University, Japan), Tatsuro Takahashi (Kyoto University, Japan), Tatsuya Mori (NTT Service Integration Laboratories, Japan), Noriaki Kamiyama (NTT Service Integration Laboratories, Japan)

[P1-14] Proactive Cache Management Method for Content Hash Based Distributed Archive System
Yutaka Yasuda (Kyoto Sangyo University, Japan), Shingo Ato (Osaka City University, Japan), Ikko Oka (Osaka City University, Japan)

Amir Kamar Das (University of Dhaka, Bangladesh), Tamal Adhikary (University of Dhaka, Bangladesh), Md. Abdur Razzaque (University of Dhaka, Bangladesh), Choong Seon Hong (Kyung Hee University, Korea)

[P1-16] Security Issues in Vehicular Networks
YeongKwan Kim (Western Illinois University, USA), Injoo Kim (East-West University, USA)

[P1-17] Security Tactics for Secured Cloud Computing Resources
ByungRae Cha (GIST (Gwangju Institute of Science & Technology), Korea), JongWon Kim (GIST (Gwangju Institute of Science & Technology), Korea)

[P1-18] A Network Partition Scheme to Protect Secure Zone for Malicious Code
JungEun Je (Soongsil University, Korea), Joopal Jang (Soongsil University, Korea), Inheo Jo (Soongsil University, Korea), Yongtae Shin (Soongsil University, Korea)

[P1-19] iPanda: A Comprehensive Malware Analysis Tool
Peidai Xie (National University of Defense Technology, China), Xicheng Lu (National University of Defense Technology, China), Jinshu Su (National University of Defense Technology, China), Yongjun Wang (National University of Defense Technology, China), Meijian Li (National University of Defense Technology, China)
[P1-20] Media Adaptation Model Based on Character Object for Cognitive TV
Svetlana Kim (Sookmyung Women University, Korea), Yong-Ik Yoon (Sookmyung Women University, Korea)

[P1-21] A New Video Search Approach Based on User’s Preference and Query Ambiguity
Wangxi Jia (Huazhong University of Science and Technology, China), Hai Jin (Huazhong University of Science and Technology, China), Xiaofei Liao (Huazhong University of Science and Technology, China)

[P1-22] Multi-supplier Integration Management for Public Protection and Disaster Relief (PPDR) Organizations
Jyri Rajamäki (Laurea University of Applied Sciences, Finland), Markus Vuorinen (HP Enterprise Services, Finland)

[P1-23] A Comparative Study on Wireless Backhaul Solutions for Beyond 4G Network
Xin Su (Inha University, Korea), KyungHi Chang (Inha University, Korea)

Jung Uye Hong (Sungkyunkwan University, Korea), Myoungbeon Chung (Sungkyunkwan University, Korea), Hyungseung Choo (Sungkyunkwan University, Korea)

[P1-25] Binary-tree-based High Speed Packet Classification System on FPGA
Jingjiao Li (Northeastern University, China), Yong Chen (Northeastern University, China), Cholman HO (KwangWoon University, Korea), Zhenlin Lu (Northeastern University, China)

[P1-26] Ontology Modeling for REST Open APIs and Web Service Mash-up Method
Wan Jung (Kwangwoon University, Korea), Sang Il Kim (KwangWoong University, Korea), Hwa Sung Kim (Kwangwoon University, Korea)

Masaharu IMAI (Kogakuen University, Japan), Yoshio Sugizaki (Kogakuen University, Japan), Koichi ASATANI (Kogakuen University, Japan)

[P1-28] Efficient Control Plane for Passive Optical Burst Switching Network
Ahmed Triki (Orange Labs, Networks and Carriers, France), Paulette Gavignet (Orange Labs, Networks and Carriers, France), Bernard Arzur (Orange Labs, Networks and Carriers, France), Esther Le Roazic (Orange Labs, France), Annie Gravey (Institut Mines Telecom - Telecom Bretagne, France)

[P1-29] A Novel Approach for Designing A Feedback Controller of Linear Time Invariant Networked Control Systems with Delayed-transmission Time
Hatim Ghazi Zaini (College of Engineering, Taif University, Saudi Arabia)

[P1-30] ANDSF-based Congestion Control Procedure in Heterogeneous Networks
Young Min Kwon (Sungkyunkwan University, Korea), Jun Suk Kim (Sungkyunkwan University, Korea), Jaheon Gu (Sungkyunkwan University, Korea), Min Young Chung (Sungkyunkwan University, Korea)

Yao-Liang Chung (National Taipei University, Taiwan)

January 30, 2013 (Wednesday)
11:00-12:00

Poster Session II
Chair : Jaesung Park, Suwon University, Korea

[P2-1] Performance Evaluation of DCSK System with Chaotic Maps
Suwa Kim (Chungbuk National University, Korea), Junyeong Bok (Chungbuk National University, Korea), Heung-Gyoon Ryu (Chungbuk National University, Korea)

[P2-2] Mobile Communications Challenges to Cross-border Tracking Operations Carried out by Law Enforcement Authorities
Jyri Rajamäki (Laurea University of Applied Sciences, Finland), Pasi Kämppi (Laurea University of Applied Sciences, Finland)

Giseop Noh (Seoul National University, Korea), Young-myung Kang (Seoul National University, Korea), Chong-woon Kim (Seoul National University, Korea)

[P2-4] An Effect of Variable Distance on IP Camera Performance Implemented on WLAN Robot
Sanon Chimmanee (Rangsit University, Thailand)

[P2-5] HRP: A HMAC-based RFID mutual authentication protocol using PUF
Seung Wook Jung (Soongsil University, Korea), Souhwan Jung (Soongsil University, Korea)

[P2-6] Analysis in The Internet Traffic Pattern Based on RTT over ADSL in Thailand
Sanon Chimmanee (Rangsit University, Thailand), Puttinun Patpituck (Faculty of Medicine Siriraj Hospital, Thailand)

[P2-7] Picture Archiving and Communication System (PACS) Characteristic on Wired-line and Wireless Network for Traffic Simulation,
Sanon Chimmanee (Rangsit University, Thailand), Puttinun Patpituck (Faculty of Medicine Siriraj Hospital, Thailand)

[P2-8] A Classification of Network Traffic Status for Various Scale Networks
JunSeong Kim (Chung-Ang University, Korea), Jae Hwa Park (Chung-Ang University, Korea)

[P2-9] Recursive Layering of Forwarding on Gates and Traffic Engineering Middleware for Ethernet
Florian Liers (Ilmenau University of Technology, Germany), Markus Hager (Ilmenau University of Technology, Germany), Sebastian Schellenberg (Ilmenau University of Technology, Germany), Jochen Seitz (Ilmenau University of Technology, Germany)
[P2-10] Time Slot-adding Algorithm for Improving Bottleneck Link Throughput in IEEE 802.16j Relay Networks
Tomoya Kitayama (Osaka University, Japan), Go Hasegawa (Osaka University, Japan), Yoshiaki Tamiguchi (Osaka University, Japan), Hirotaka Nakano (Osaka University, Japan)

[P2-11] Influence of Multi-rate Control Function on the End-to-end Latency of Multi-hop Wireless LAN
Michifumi Miyashita (Central Research Institute of Electric Power Industry, Japan); Jun-ichi Takada (Tokyo Institute of Technology, Japan)

[P2-12] Reliable Anchor Node Based Range-free Localization Algorithm in Anisotropic Wireless Sensor Networks
Hyunjae Woo (Ajou University, Korea), Chaewoo Lee (Ajou University, Korea), Seongkeun Oh (Ajou University, Korea)

Markus Hager (Ilmenau University of Technology, Germany); Maik Debes (Ilmenau University of Technology, Germany); Sebastian Schellenberg (Ilmenau University of Technology, Germany); Jochen Seitz (Ilmenau University of Technology, Germany)

[P2-14] Redundant Transmission in Wireless Networked Control System over IEEE 802.15.4e
Bai Xuan Yen (Soongsil University, Korea), Do Trong Hop (Soongsil University, Korea), Myungsik Yoo (Soongsil University, Korea)

[P2-15] Range-free Localization with Isotropic Distance Scaling in Wireless Sensor Networks
Hyunjae Woo (Ajou University, Korea), Sangwoo Lee (Ajou University, Korea), Chaewoo Lee (Ajou University, Korea)

[P2-16] Bandwidth-aware Routing for TDMA-based Mobile Ad Hoc Networks
Xia Zhen (Wuhan Polytechnic University, China), Yang wenzhong (XinJiang University, China)

[P2-17] Packet Value Based Scheduling for Wireless Local Area Networks
Arama Javasuriya (CQ University, Australia), Anselm Teh (University of South Australia, Australia)

[P2-18] A Scheduling Algorithm for Shared Sensor and Actuator Networks
Claudio M. de Farias (Federal University of Rio de Janeiro, Brazil), Luci Freire (Federal University of Rio de Janeiro, Brazil), Flávia C. Delicato (Federal University of Rio de Janeiro, Brazil), Wei Li (The University of Science, Australia), Albert Y. Zomaya (The University of Sydney, Australia), José A. de Souza (Federal University of Ceará, Brazil)

[P2-19] Signaling-based Service Quality Adaptation in Heterogeneous Networks
Jaehoon Jeong (Yonsei University, Korea), Hyeryung Jang (KAIST, Korea), Yujin Kim (Yonsei University, Korea)

[P2-20] Secure Handoff Method for Seamless Service Provisioning in Infrastructure Mode 802.11i System
Jaeung Park (Swinon University, Korea)

[P2-21] A Binary Analysis Method for Protocol Deviation Discovery from Implementations
Meijian Li (NUDT, China), Yongjun Wang (NUDT, China), Peidai Xie (NUDT, China)

[P2-22] Software Optimization for Embedded Communication System
Inhye Park (Kwangwoon University, Korea), Hyungkeun Lee (Kwangwoon University, Korea), Hyukjoon Lee (Kwangwoon University, Korea)

[P2-23] Radio Access Considerations for Data Offloading with Multipath TCP in Cellular/WiFi Networks
Miguel Angel Patiño González (Nara Institute of Science and Technology, Japan); Takeshi Higashino (Nara Institute of Science and Technology, Japan); Minoru Okada (Nara Institute of Science and Technology, Japan)

[P2-24] Network Traffic Reduction through Smart Network
Jaehoon Jeong (Yonsei University, Korea), Hyeryung Jang (KAIST, Korea), Byeong-hee Roh (Ajou University, Korea)

Bharat S. Rawal (Shaw University, USA), Lewis Berman (Loyola University Maryland, USA), Harold Ramcharan (Shaw University, USA)

[P2-26] An Interworking Architecture between Internet and Contents Oriented Networks
Haneul Ko (Korea University, Korea), Younghyun Kim (Korea University, Korea), Minso Shin (Korea University, Korea), Sangheon Park (Korea University, Korea)

[P2-27] Feasibility Considerations of Multipath TCP in Dealing with Big Data Application
Zia Ush Shamszaman (Hankuk University of Foreign Studies, Korea), Saffina Showkat Ara (Hankuk University of Foreign Studies, Korea), Ilyoung Chong (Hankuk University of Foreign Studies, Korea)

[P2-28] Correlation Analysis of MQTT Loss and Delay According to QoS Level
Shinho Lee (Keimyung University, Korea), Hyeonwoo Kim (Keimyung University, Korea), Dong-kweon Hong (Keimyung University, Korea), Hongtaek Ju (Keimyung University, Korea)
Conferences Room Map

4th Floor
CHATRIUM Hotel Riverside Bangkok
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Located on the banks of the majestic Chao Phraya River with the cultural and historical hub of Bangkok at its
doors, the 5-star Chatrium Hotel Riverside Bangkok offers a premium choice in Bangkok accommodation
by blending spacious yet luxurious contemporary rooms and suites with warm and friendly Thai hospitality.

Winner of Trip Advisors 2012 Travelers' Choice Award for Best Hotel Bangkok, amongst all Bangkok Hotels,
Thailand, our very large rooms and suites, all with large balconies and stunning views, combined with friendly
and attentive service are just some of the simply remarkable features we offer as a 5-Star Hotel Bangkok.

Whether for business, leisure, meetings or just simply pleasure, our ability to tailor our products and services
to your needs will certainly create a remarkable experience within the most remarkable Hotel in Bangkok.

Location

The magic, mystery and charm of the Chao Phraya River that flows through the inner city of Bangkok awaits
when you stay at Chatrium Hotel Riverside Bangkok, ideally located in the cultural and historical hub of
Bangkok while just 35 minutes from Suvanabhumi International Airport. Complementary shuttle boat services
make the city's modern and efficient Bangkok Mass Transit System (BTS) a short but pleasant boat ride away.
Close to the expressway and Central Business district, making both business and leisure activities a pleasure
BANGKOK TRAVEL GUIDE

Bangkok (Thai: กรุงเทพฯ Krung Thep) is the capital of Thailand and, with a population of over eleven million inhabitants, by far its largest city. Its high-rise buildings, heavy traffic congestion, intense heat and naughty nightlife do not immediately give you a warm welcome — but don't let your first impression mislead you. It is one of Asia's most cosmopolitan cities with magnificent temples and palaces, authentic canals, busy markets and a vibrant nightlife that has something for everyone. For years, it was only a small trading post at the banks of the Chao Phraya River, until King Rama I, the first monarch of the present Chakri dynasty, turned it into the capital of Siam in 1782, after the burning of Ayutthaya by Burmese invaders.

Since then, Bangkok has turned into a national treasure house and functions as Thailand's spiritual, cultural, political, commercial, educational and diplomatic centre. Enjoy a memorable dinner cruise adrift the Chao Phraya River. Bask in the city’s warm, affluent glow at a skyscraping rooftop bar. Experience all the things – tuk-tuk ride, ladyboy show, Muay Thai (kickboxing) match, Thai massage – everyone always comes home talking about.

Climate

According to the World Meteorological Organization, Bangkok is the world's hottest city. Located just 14 degrees north of the Equator, Bangkok is sunny at any time of the year with temperatures over 30°C (86°F).
Travel Information

Temple of Dawn

Wat Arun, locally known as Wat Chaeng, is situated on the west (Thonburi) bank of the Chao Phraya River. It is believed that after fighting his way out of Ayutthaya, which was besieged by a Burmese army at the time, King Taksin arrived at this temple just as dawn was breaking. He later had the temple renovated and renamed it Wat Chaeng, the Temple of the Dawn. During his reign (Thonburi Period), Wat Chaeng was the chief temple, and it once enshrined the Emerald Buddha and another important Buddha image, the Phra Bang, both of which had been removed from Vientiane.

Temple of Reclining Buddha

Wat Pho (the Temple of the Reclining Buddha), or Wat Phra Chetuphon, is located behind the splendid Temple of the Emerald Buddha. It's the largest temple in Bangkok and famed for its huge and majestic reclining Buddha measured 46 metres long and covered in gold leaf. The Buddha's feet are 3 metres long and exquisitely decorated in mother-of-pearl illustrations of auspicious 'laksanas' (characteristics) of the Buddha.

Temple of Emerald Buddha

Wat Phra Kaew or the Temple of the Emerald Buddha (officially known as Wat Phra Sri Rattana Satsadaram) is regarded as the most important Buddhist temple in Thailand. Located in the historic centre of Bangkok, within the grounds of the Grand Palace, it enshrines Phra Kaew Morakot (the Emerald Buddha), the highly revered Buddha image meticulously carved from a single block of jade.

The Emerald Buddha (Phra Putta Maha Mani Ratana Patimakorn) is a Buddha image in the meditating position in the style of the Lanna school of the north, dating from the 15th century AD.
Travel Information

The Grand Palace

A strict dress code applies. The Grand Palace with The Temple of the Emerald Buddha is Thailand's most sacred site. Visitors must be properly dressed before being allowed entry to the temple. Men must wear long pants and shirts with sleeves (no tank tops. If you're wearing sandals or flip-flops you must wear socks (in other words, no bare feet.) Women must be similarly modestly dressed. No see-through clothes, bare shoulders, etc. If you show up at the front gate improperly dressed, there is a booth near the entrance that can provide clothes to cover you up properly (a deposit is required).

Floating market

Even though transactions are more concerned with tourists rather than locals these days, the floating market;boats are still piled high with tropical fruit and vegetables, fresh, ready-to-drink coconut juice and local food cooked from floating kitchens located right on the boat. To enjoy the atmosphere without haggling over prices, try relaxing on a guided boat tour of Damnoen Saduak market. Floating markets are Taling Chan Market, Bang Ku Wiang Market, Tha Kha, and Damnoen Saduak.

Chinatown

Bangkok’s Chinatown is a popular tourist attraction and a food haven for new generation gourmands who flock here after sunset to explore the vibrant street-side cuisine. At day time, it’s no less busy, as hordes of shoppers descend upon this 1-km strip and adjacent Charoenkrung Road to get a day’s worth of staple, trade gold, or pay a visit to one of the Chinese temples. Packed with market stalls, street-side restaurants and a dense concentration of gold shops, Chinatown is an experience not to miss. The energy that oozes from its endless rows of wooden shop-houses is plain contagious – it will keep you wanting to come back for more.
Khao San Road

If Bangkok is a city where East greets West, then Khao San Road is the scene of their collision, the place where they jostle for superiority and poke one another in the eye. With travellers from every corner of the modern world, sleek clubs playing sophisticated sounds, eclectic market stalls, converted VW cocktail bars, and foods tamed to suit the Western palate, it may seem clear who won the fight. However, whether you’re a hard-up farang (foreigner) or open-minded Thai, its irrepressible energy and carefree vibe makes it well worth a visit.

Bangkok golf

Bangkok golf courses offer great value for money with many excellent golf clubs offering a high level of service at very competitive prices. Golf tours and holidays have grown rapidly across Thailand, particularly in Bangkok where there are scores of delightful golf courses and clubs within easy reach of the city centre. Most of them have been renovated and developed to world-class standards. Indeed, Bangkok is now a hub of international golfing activities and offers the perfect combination of city and leisure facilities. Excellent clubhouse amenities, challenging scenic courses and smiling, friendly service ensure that a golfing holiday in Bangkok is a golfer’s paradise.

Calypso Ladyboy Show

An explosion of lights, sounds and pouts, the famous Calypso Ladyboy Cabaret is a breathless blend of incredible sets, glittering costumes and thrilling musical acts. Despite what you have seen or heard about Thai ladyboys, these performers are good at what they do best: looking and acting just like the real thing. You will be left dazzled by the show and quite possibly smitten with the many gender-straddling performers. Meet 'Marilyn Monroe', 'Michael Jackson' and Portuguese-Brazilian 1940s starlet 'Carmen Miranda', along with a
string of their diva friends. This is an entertaining night out for families, couples and any curious souls expecting to be surprised.

**Siam Niramit Show**

Siam Niramit combines an authentic Thai buffet with a world-class stage show depicting Thailand's historical and spiritual heritage. With over 150 dazzling performers and state-of-the-art special effects, it’s a captivating journey. The first act describes how Siam became a cross-roads where civilisations met, the second how karma binds Thai people, and the final act shows how religious ceremony earns Thai people merit in this life. In addition to the show, you can visit replica villages from the country's rural regions and buy Thai handicrafts.