

# The 10th Annual IEEE Consumer Communications & Networking Conference

January 11-14, 2013

Las Vegas, Nevada USA



**FINAL PROGRAM**

[www.ieee-ccnc.org/2013](http://www.ieee-ccnc.org/2013)



Welcome .....	3
Committees .....	5
Friday Program: Tutorials & Workshops .....	9
Saturday Program: Keynotes, Demos, Panel & Technical Sessions .....	11
Sunday Program: Keynote, Workshop, Demos & Technical Sessions .....	14

Monday Program: Tutorial & Work-in-Progress Sessions ...	17
Keynotes .....	20
Demonstrations .....	24
Social Program .....	27
Floor Plan .....	28
Patrons .....	30

## GENERAL INFORMATION

### IEEE CCNC 2013 Badges and Tickets

IEEE CCNC 2013 Badges must be worn at all times and are necessary for entrance into all IEEE CCNC events. Tickets are required for the Saturday and Sunday Luncheons and the Conference Banquet.

### Registration

The Registration Desk will be located outside the Sunset Ballroom. All attendees must register and receive a conference badge in order to participate in conference activities.

Hours for the Registration Desk will be:

Friday, January 11	07:30 – 18:00
Saturday, January 12	08:00 – 18:00
Sunday, January 13	08:00 – 18:00
Monday, January 14	08:00 – 14:00

### Conference Meals

Included in the price of the full registration are the Opening Reception, Two Luncheons, Happy Demo Hour and Banquet.

### Business Service

Open Monday – Friday from 07:00 – 19:00 and Saturday and Sunday from 08:00 – 17:00. The UPS Store / Business Center offers express packing, notary services, faxing, internet / computer rental stations, wired laptop connectivity, laptop rentals, copies and scanning, desktop publishing, packing and shipping supplies and office equipment.

### Internet Access

IEEE CCNC will offer free wireless access in all of the conference meeting rooms on all four days of the conference.

Guest rooms have high speed internet so that you can check emails and work on your laptop from the comfort of your guest room.

### A Friendly Reminder

Please turn off anything that chirps, beeps, buzzes or rings which includes but not limited to pagers, beepers, cell phones, PDA and laptops during the conference. The speakers and audience thank you for your consideration and cooperation.

### Dress Attire

Business casual is recommended for all daytime and evening IEEE CCNC 2013 events.

### Conference Location

All conference events on the schedule at a glance will be held at the Flamingo. The majority of the conference will take place in the Corporate Convention Center.

### Flamingo Las Vegas

3555 Las Vegas Blvd. South  
Las Vegas, NV 89109  
Phone: 888-902-9929

# MESSAGE FROM THE GENERAL CHAIR



On behalf of the IEEE CCNC 2013 Organizing Committee, it is my pleasure to welcome you to the Tenth Annual IEEE Consumer Communications and Networking Conference.

This year's IEEE CCNC follows its well-recognized tradition of combining theory and practice by bringing together academia and industry in the key future growth area of consumer communications – which, as all of us witness every day, is reshaping the consumer landscape, from social networking and mobile commerce, to entertainment and education. In spite of the tough economic times over the last few years, IEEE CCNC has continued to receive a great number of submissions, allowing us to compile a comprehensive program with many excellent contributions and with numerous distinguished industry experts offering keynotes, workshops and tutorials for our participants.

Reflecting the mix of academia and industry, with many IEEE CCNC participants also visiting CES, this year we continue our integration with CES: the first day of IEEE CCNC overlaps with the final day of CES, a move we hope simplifies participation of CES attendees in the tutorials and workshops.

IEEE CCNC 2013 emphasizes the future direction of the evolution of the consumer communications: convergence of communications and computing enhancing and creating new possibilities of consumer communications and applications. To accommodate the fast evolution, the technical tracks got overhauled and expanded in a great extent, now covering from wireless communications to green communications to intelligent computing. This change lets IEEE CCNC cover what really matters to consumers. But also by choosing targeted topics for our four workshops that explore novel directions and offer a forum for recent research results. Our five tutorials capture the key topics of today's and tomorrow's consumer communications and networking. The IEEE CCNC program is completed by an industry panel looking at the enabling technologies and opportunities in smart home energy management. IEEE CCNC thus continues to recognize the need for an exchange across layers, businesses, and academia/industry and provides a premier venue meeting this demand!

We are proud to welcome four high-caliber distinguished speakers from academia and industry who will be sharing their perspectives with us. For the opening keynote on Saturday morning, we are very pleased to present Dr. Donald L. Schilling, Life Fellow of the IEEE and Chairman of LINEX Technologies. On Saturday evening, we are honored to present our second keynote speaker, Dr. Kilsu Eo, Executive Vice President of Samsung Electronics and Vice Chairman of Korea Embedded Software Industry Council. On Sunday morning, we are very pleased to present our third keynote speaker from Microsoft. Finally, we are happy to announce our fourth keynote, scheduled for Sunday evening, will be given by Dr. I.P. Park, Executive Vice President and CTO of HARMAN International.

We are confident that you will find a multitude of stimulating presentations in the technical sessions for which we want to thank Jin Li for putting together an extremely strong set of papers across all topics relevant to consumer communications. Jin's introduction on the following pages will provide you with further guidance where to set your sights on. The regular sessions are augmented by work-in-progress-style short papers. This year's IEEE CCNC will continue the past success of live demonstrations, emphasizing its practical side. We are happy to offer two demonstration sessions, these follow the lunch break on Saturday and Sunday.

It is exciting to hold the first Grand Challenge in IEEE CCNC, which is going to be a very special live event, Mobile Code Jam, this year where researchers and students present their creative ideas and programming skills in developing innovative and socially valuable mobile apps while competing for cash prizes.

Following the popularity of the previous years, we again offer complimentary tutorials to all attendees. IEEE CCNC 2013 features five tutorials on a broad set of topics, from advances in home networking standardization to vehicular networking. Please check the variety of offerings. The tutorials will be taking place on Friday and Monday.

Finally, I want to extend my thanks to the people who are truly responsible for making this conference a success through their generous contributions of time and energy. My thanks to: Jin Li, Technical Program Chair; Cheng Huang, Grand Challenge Chair; Stan Moyer, Industry Session Chair; Frank den Hartog and Venkatesh Prasad, Demo Co-Chairs; Alexandros G. Dimakis, Workshop Chair; Sudipta Sengupta, Tutorial Chair; Alex Gelman, Publicity Chair; Rob Fish, Patron Chair; Henry Holtzman, Best Paper Award Chair; Bruce Worthman, Treasurer; Heather Sweeney, Marketing; and finally special thanks to Diane Williams, who as ComSoc Project Manager did – once more – a tremendous job of pulling everything together.

We are looking forward to exciting event and hope that you will find IEEE CCNC 2013 to be enjoyable and a great place to discuss and network.

**IEEE CCNC 2013 General Chair**  
**Eunsoo Shim**  
Samsung Electronics, Korea

# MESSAGE FROM THE TECHNICAL PROGRAM CHAIR



On behalf of the Technical Program Committee, I warmly welcome you to Las Vegas for an exciting technical program offered by the 2013 IEEE Consumer Communications and Networking Conference (CCNC).

Overlapping the 2013 International Consumer Electronics Show (CES), IEEE CCNC was specifically organized by the IEEE Communications Society (ComSoc) to drive the development of global consumer electronics technologies that will one day provide access to information anytime, anywhere, regardless of time or location. The conference enjoys strong support and participation from the consumer electronics industry and provides a mutually beneficial mix of academic and industrial participation.

This year, we have expanded the technical scopes of IEEE CCNC to include 13 sessions. They are:

- Mobile Device, Platform and Applications
- Social Networking & Social Media
- Wireless Networking
- Peer-to-Peer Networking and Cloud-based Content Distribution
- Multimedia Networking, Services and Applications
- Smart Spaces and Sensor Networks
- Security, Content Protection and DRM
- Vehicular Communications and Networking: V2V, V2I, V2R and V2U
- Green Communications and Computations
- eHealth, Ambient Assisted Living
- Intelligent and Emotion-oriented Computing
- 3D Imaging, Processing, Communication and Display

We are pleased to report a strong technical program with exceptional quality. The IEEE CCNC 2013 main program received 313 submissions. Lead by 18 Vice TPC Chairs, 402 reviewers were recruited to provide a rigorous double-blind review. On average, each paper received 3 independent reviews (910 reviews total). These reviews served as the basis to select 95 papers for presentation (30% acceptance rate). In addition, 47 papers have been selected to present in the work-in-progress session.

During the main conference (January 12-14, 2013, Saturday to Monday), IEEE CCNC 2013 will start with a keynote talk delivered by a world class scientist/practitioner. After that, the accepted papers will be presented in four parallel sessions. One oral session will be presented in the morning, and two additional oral sessions will be presented in the afternoon. A panel on Home Energy Management Networking will be presented in the afternoon of Saturday, January 12, 2013. We have designed the program considering the diversified background of IEEE CCNC audience, so that you can always find a high quality talk of your interest at any given time, be it a high quality paper presentation or a panel. In addition, a one hour demo session will be held each afternoon after lunch to showcase a selection of exciting leading edge consumer communication demos, some of which will be presented at the Consumer Electronics Show (CES) at IEEE booth. The paper in the Work-In-Progress program will be presented on Monday, January 14, 2013.

One unique feature of IEEE CCNC 2013 is that the audience will be invited to vote for the best paper award and best student paper award of IEEE CCNC 2013. Each registered attendee will receive a voting sheet. Their votes will be combined with votes from an on-site award committee to determine the awards of IEEE CCNC 2013, which will be announced at the banquet.

IEEE CCNC 2013 will offer five tutorials shared by world experts. IEEE CCNC 2013 will also present four workshops (15 accepted papers in total), which are:

- Workshop on Consumer eHealth Platforms, Services and Applications;
- Workshop on People Centric Sensing and Communications;
- Workshop on Internet of Things- RFIDs, WSNs and Beyond;
- Touch of Genius – Script any Device with TouchDevelop.

I am excited that we will hold the first Grand Challenge at IEEE CCNC, which is going to be a very special live event, Mobile Code Jam, where researchers and students present their creative ideas and programming skills in developing innovative and socially valuable mobile apps while competing for cash prizes at IEEE CCNC 2013.

All this would not have been possible without the tremendous efforts of volunteers organizing the technical tracks, workshops, tutorials, panels and demos; and the many TPC members and reviewers that provide the input for the papers at IEEE CCNC 2013. Most notably, I would like to thank the TPC Vice Chairs: Ben Falcuk, ACS/Ericsson; Henry Holtzman, MIT (also Best Paper Award Chair); Angela Yingjun Zhang, CUHK; Wei Chen, Tsinghua University; Xi Zhang, Texas A&M University; Wei Yu, Towson University; Kurt Tutschku, University of Vienna; Marie-Jose Montpetit, MIT; Damla Turgut, Univ. of Central Florida; Frederick T. Sheldon, Oak Ridge National Laboratory; Ton Kalker, Huawei; David Matolak, Ohio University; Richard Yu, Carleton University; Pradeep Ray, Australian School of Business; Artur Serrano, NST; Youngsang Choi, Samsung; Du Sik Park, Samsung; Seungsin Lee, Samsung; Tutorial Chair: Sudipta Sengupta, Microsoft; Demonstration Co-Chairs: Frank den Hartog, TNO; Venkatesha Prasad, TU Delft; Grand Challenge Chair: Cheng Huang, Microsoft; Industrial Chair: Stan Moyer, Inventures; and Student Council Chairs: Yanjiao Chen, HKUST; and Vida Ferdowsi, University of Missouri. I would also like to thank Workshop Chair: Alex Dimakis, USC; and the workshop organizers.

A very special thanks goes to the Conference General Chair, Eunsoo Shim, Samsung, for his leadership and the Steering Committee Chair: Rob Fish for his support of the organization committee to make IEEE CCNC 2013 a success. I would also like to express sincere thanks and gratitude to Diane Williams, who as the Conference Manager has done a tremendous detailed job supporting the conference as a whole. Finally, I would also like to thank our patrons: Samsung, Harmon and Microsoft at Diamond level, and TNO, Quby, Ether Trust and Aniketos at Demo level.

I hope that you will enjoy our high-quality technical program; and will take advantage of the opportunities to learn about the latest research findings and the state-of-the-art consumer communications and networking technologies. Hopefully, you will have a chance to see old friends and make new ones; and will have an opportunity to discuss exciting new ideas with your colleagues. Please also enjoy the excellent food and shows in the evening in the special city of Las Vegas!

**IEEE CCNC 2013 TPC Chair**  
**Jin Li**  
Microsoft, USA

# COMMITTEES

## ORGANIZING COMMITTEE

### General Chair

**Eunsoo Shim**, Samsung Electronics Co. LTD, Korea

### Technical Program Chair

**Jin Li**, Microsoft, USA

### TPC Vice-Chairs

*Mobile Device, Platform and Applications*

**Chair: Ben Falchuk**, ACS/Ericsson, USA

*Social Networking & Social Media*

**Chair: Henry Holtzman**, MIT Media Lab, USA

*Wireless Communications*

**Chair: Angela Yingjun Zhang**, CUHK

*Wireless Networking*

**Chair: Xi Zhang**, Texas A&M University

*Peer-to-Peer Networking and Cloud-Based Content Distribution*

**Chair: Kurt Tutschku**, University of Vienna, Austria

*Multimedia Networking, Services and Applications*

**Chair: Marie-José Montpetit**, MIT, USA

*Smart Spaces and Sensor Networks*

**Chair: Damla Turgut**, University of Central Florida

*Security, Content Protection and DRM*

**Chair: Ton Talker**, Huawei Technologies, USA

*Vehicular Communications and Networking: V2V, V2I, V2R, and V2U*

**Chair: David Matolak**, Ohio University

*Green Communications and Computations*

**Chairs: Xi Zhang**, Texas A&M University

**F. Richard Yu**, Carleton University

*eHealth, Ambient Assisted Living*

**Chairs: Artur Serrano**, NST

**Pradeep Ray**, University of New South Wales

*Telepresence & Tele-robot*

**Chairs: Cha Zhang**, Microsoft

**Ruigang Yang**, University of Kentucky

*Intelligent and Emotion-oriented Computing*

**Chair: Young Sang Choi**, Samsung

*3D Imaging, Processing, Communication and Display*

**Chairs: Du Sik Park**, Samsung

**Seungsin Lee**, Samsung

### Grand Challenge

**Chair: Cheng Huang**, Microsoft

### Industry Session

**Chair: Stan Moyer**, Inventures

### Demos

**Chairs: Frank den Hartog**, TNO

**Venkatesha Prasad**, TU Delft

### Workshops

**Chair: Alexandros G. Dimakis**, USC

### Tutorials

**Chair: Sudipta Sengupta**, Microsoft

### Student Council

**Chairs: Yanjiao Chen**, HKUST

**Vida Ferdowsi**, University of Missouri, Kansas

### Patron Chair

**Rob Fish**, NETovations LLC

### Best Paper Award Chair

**Henry Holtzman**, MIT Media Lab

## STEERING COMMITTEE

**Chair: Robert Fish**, NETovations, LLC

**Vice Co-Chairs: Stan Moyer**, Global Inventures

**Alex Gelman**, NETovations, LLC

**Secretary: Alan Kaplan**, Drakontas

**V. Michael Bove**, MIT Media Lab

**John Buford**, Avaya

**Gary (Shueng-Han) Chan**, Hong Kong University of Science and Technology

**K.C. (Kwang-Cheng) Chen**, National Taiwan University

**Henry Holtzman**, MIT Media Lab

**Mario Kolberg**, University of Stirling

**Frank den Hartog**, TNO

**Jin Li**, Microsoft

**Madjid Merabti**, Liverpool John Moores University

**I.P. Park**, Harman, Inc.

**Eunsoo Shim**, Samsung

**Behrooz Shirazi**, Washington State University

**Bin Wei**, Georgia Southern University

**Heather Yu**, Huawei Technologies

**Wenjun Zeng**, University of Missouri, Columbia

**Doug Zuckerman**, Applied Communication Sciences



## Mobile Device, Platform and Applications

**Chair: Ben Falchuk**, ACS/Ericsson

Pablo Cesar, CWI  
Schahram Dustdar, Technical University Vienna  
Ashutosh Dutta, Niksun  
Stenio Fernandes, University Pernambuco  
Martin Gaedke, Chemnitz University  
Haibo He, University of Rhode Island  
Manabu Ito, KDDI  
Satoshi Komorita, KDDI  
David Llewellyn-Jones, Liverpool John Moore's University  
Shoshana Loeb, 2M  
Archan Misra, Singapore Management University  
Raquel Morera, Verizon  
Michel Ouelette, Iometrix  
Kai Rannenber, Goethe University  
Patrick Seeling, Central Michigan University  
Spiros Spirou, Intracom Telecom

## Social Networking & Social Media

**Chair: Henry Holtzman**, MIT

Nadav Aharony, MIT  
Pablo Cesar, CWI  
Andrea Colaco, MIT Media Lab  
Alina Krischkowsky, University of Salzburg  
Rodrigo Laiola Guimaraes, Centrum Wiskunde & Informatica  
Marie-Jose Montpetit, MIT RLE  
Marianna Obrist, Newcastle University  
Celia Quico, Universidade Lusófona de Humanidades e Tecnologias

## Wireless Communications

**Chair: Angela Yingjun Zhang**, CUHK

Wei Chen, Tsinghua University  
David Grace, York University  
Rajendra Boppana, University of Texas at San Antonio  
Carlos Calafate, Universidad Politécnica de Valencia  
Daniel Camps-Mur, NEC  
Juan-Carlos Cano, Universidad Politecnica de Valencia  
Eduardo Cerqueira, Federal University of Para  
Chung Shue Chen, Alcatel-Lucent Bell Labs  
Woon Hau Chin, Toshiba Research Europe Limited  
Tasos Dagiuklas, Technological Educational Institute of Mesolonghi  
Shane Dempsey, Gaisan Technologies  
Ugo Dias, University of Brasilia  
Yu Dong, IBM  
Michael Einhaus, Panasonic R&D Center Germany  
Zhong Fan, Toshiba Research Europe  
Xiaoying Gan, Shanghai Jiao Tong University  
Javier Gozalvez, Universidad Miguel Hernandez de Elche  
Fabrizio Granelli, University of Trento  
Choong Seon Hong, Kyung Hee University  
Youssef Iraqi, Khalifa University  
Athanasios Kanatas, University of Piraeus  
George Karagiannidis, Aristotle University of Thessaloniki  
Kimon Kontovasilis, NCSR Demokritos  
Ka-Cheong Leung, University of Hong Kong  
Kejie Lu, University of Puerto Rico, Mayaguez

Xuanwen Luo, Sandvik Mining and Construction  
Andreas Maeder, NEC Laboratories Europe  
Pietro Manzoni, Universidad Politécnica de Valencia  
Natarajan Meghanathan, Jackson State University  
George Michailidis, University of Michigan  
Edmundo Monteiro, University of Coimbra  
Evangelos Pallis, Centre for Technological Research of Crete  
Ashish Pandharipande, Philips Research  
Panagiotis Papadimitriou, Leibniz University of Hannover  
Patrick Phelan, Waterford Institute of Technology  
Christos Politis, Kingston University  
Neeli Prasad, Center for TeleInfrastructure  
Joel Rodrigues, Instituto de Telecomunicações, University of Beira Interior  
Jonathan Rodriguez, Instituto de Telecomunicações  
Guenter Schaefer, Technische Universität Ilmenau  
Yi Shang, University of Missouri  
Fangyang Shen, New York City College of Technology  
Hongchi Shi, Texas State University, San Marcos  
Dimitrios Skoutas, University of the Aegean  
Rahim Tafazolli, University of Surrey  
Vincent Tam, University of Hong Kong  
Duc Tran, University of Massachusetts Boston  
Dimitrios D. Vergados, University of Piraeus  
Christos Verikoukis, Telecommunications Technological Centre of Catalonia  
Demosthenes Vouyioukas, University of the Aegean  
Dandan Wang, Alcatel-Lucent  
Weichao Wang, University of North Carolina, Charlotte  
Qin Xin, University of the Faroe Islands  
Yuedong Xu, INRIA  
Dong Zheng, Broadcom  
Nizar Zorba, QMIC

## Wireless Networking

**Chair: Xi Zhang**, Texas A&M University

Wei Yu, Towson University  
Hossam Afifi, Institut Telecom  
Hasan Cam, Army Research Laboratory  
Sriram Chellappan, Missouri University of Science and Technology  
Biao Chen, University of Macau  
Hui Chen, Virginia State University  
Maggie Cheng, Missouri University of Science and Technology  
Wei Cheng, University of Massachusetts Lowell  
Sunghyun Choi, Seoul National University  
Xu Chong, University of St. Thomas  
Song Ci, University of Nebraska-Lincoln  
Jun-Hong Cui, University of Connecticut  
Jing Deng, University of North Carolina, Greensboro  
Yu-ning Dong, Nanjing University of Posts and Telecommunications  
Xiaojiang Du, Temple University  
Qiang Duan, Pennsylvania State University  
Xinwen Fu, University of Massachusetts Lowell  
Linqiang Ge, Towson University  
David Griffith, NIST  
Yong Guan, Iowa State University  
Rommie Hardy, Army Research Lab  
Rose Qingyang Hu, USU  
Qun Li, College of William and Mary  
Shan Lin, Temple University  
Xiaodong Lin, University of Ontario Institute of Technology  
Zhen Ling, Southeast University

# COMMITTEES

Yao Liu, University of South Florida  
Chao Lu, Towson University  
Miao Pan, Texas Southern University  
Jian Ren, Michigan State University  
Robert Reschly, US Army Research Laboratory  
Ronggong Song, DRDC-Ottawa  
Wei Song, University of New Brunswick  
Michael Souryal, NIST  
Kun Sun, George Mason University  
Chiu Tan, Temple University  
Bin Tang, Azusa Pacific University  
Jian Tang, Syracuse University  
Chonggang Wang, InterDigital Communications  
Alexander Wijesinha, Towson University  
Shaoren Wu, University of Southern Mississippi  
Liang Xiao, Xiamen University  
Yang Xiao, University of Alabama  
Linda Jiang Xie, University of North Carolina, Charlotte  
Guobin Xu, Towson University  
Bo Yang, Bowie State University  
F. Richard Yu, Carleton University  
Paul Yu, Army Research Laboratory  
Sherali Zeadally, University of the District of Columbia  
Jiucui Zhang, University of Nebraska-Lincoln  
Nan Zhang, George Washington University  
Zhenghao Zhang, Florida State University  
Peng Zhao, Xi'an Jiaotong University  
Peer-to-Peer Networking and Cloud-Based Content Distribution  
Chair: Kurt Tutschku, University of Vienna  
Ralf Ackermann, SAP Research  
Dewan Ahmed, University of Ottawa  
Michele Amoretti, Università degli Studi di Parma  
Claudio Amorim, Federal University of Rio de Janeiro  
Fabienne Anhalt, Ecole Normale Supérieure de Lyon  
Aytac Azgin, Georgia Institute of Technology  
Sardford Bessler, Telecommunications Research Center Vienna  
Arkadiusz Biernacki, Silesian University of Technology  
Torsten Braun, University of Bern  
John Buford, Avaya Labs Research  
Jiannong Cao, Hong Kong Polytechnic University  
Joachim Charzinski, Stuttgart Media University  
Cheng-Fu Chou, NTU  
Franca Delmastro, IIT-CNR  
Wilfried Elmenreich, University of Klagenfurt  
Markus Fidler, Leibniz Universität Hannover  
Stefan Fischer, University of Lübeck  
Sarnas Girdzijauskas, Swedish Institute of Computer Science  
Artan Halimi, A1 Telekom Austria  
Behnoosh Hariri, University of Ottawa  
Tobias Hoffeld, University of Würzburg  
Norihiro Ishikawa, Komazawa University  
Vana Kalogeraki, University of California, Riverside  
Jussi Kangasharju, University of Helsinki  
Holger Karl, University of Paderborn  
Wolfgang Kellerer, Technische Universität München  
Wei-Shinn Ku, Auburn University  
Olaf Landsiedel, Chalmers University of Technology  
Li Li, Communication Research Centre of Canada  
Renato Lo Cigno, University of Trento  
Eng Lua, Monash University  
Michela Meo, Politecnico di Torino  
Klaus Moessner, University of Surrey  
Mubashar Mushtaq, Quaid-i-Azam University  
Nikos Ntarmos, University of Ioannina  
Oznur Ozkasap, Koc University

Kostas Pentikousis, Huawei Technologies  
Christian Prehofer, Fraunhofer ESK  
Ivica Rimac, Bell Labs, Alcatel-Lucent  
Etienne Riviere, University of Neuchâtel  
Dario Rossi, Telecom ParisTech  
George Roussos, Birkbeck College, University of London  
Sebnem Rusitschka, Siemens AG  
Krzysztof Rzadca, University of Warsaw  
Susana Sargento, Instituto de Telecomunicações, Universidade de Aveiro  
Stefan Schmid, TU Berlin  
Matteo Sereno, University of Torino  
Martin Stiernerling, NEC Europe Labs  
Hailong Sun, Beihang University  
Danny Tsang, HKUST  
Oliver Waldhorst, Karlsruhe Institute of Technology  
Joerg Widmer, Institute IMDEA Networks  
Xiaotao Wu, Avaya Labs Research  
Haiyong Xie, Huawei Technologies

---

## Multimedia Networking, Services and Applications

Chair: Marie-José Montpetit, MIT

Oscar Bonastre, Miguel Hernandez University of Elche  
Eduardo Cerqueira, Federal University of Para  
Pablo Cesar, CWI  
Frank den Hartog, TNO  
Lorenzo Favalli, University of Pavia  
Frank Fitzek, Aalborg University  
Mario Freire, University of Beira Interior  
Oliver Friedrich, T-Systems  
Henry Holtzman, MIT Media Lab  
Chih-Heng Ke, National Kinmen Institute of Technology  
Lisimachos Kondi, University of Ioannina  
Zhu Liu, AT&T Labs – Research  
Daniel Lucani, Aalborg University  
Maode Ma, Nanyang Technological University  
Maja Matijasevic, University of Zagreb  
Hadi Otrok, Khalifa University of Science, Technology & Research  
Sherif Rashad, Morehead State University  
Marco Roccetti, University of Bologna  
Ana Luisa Santos, Mob376  
Binod Vaidya, University of Ottawa  
Smart Spaces and Sensor Networks  
Chair: Damla Turgut, University of Central Florida  
Frederick T. Sheldon, ORNL  
Charles Addo-Quaye, Penn State University  
Regina Araujo, Federal University of São Carlos  
Ladislau Bölöni, University of Central Florida  
Eleonora Borgia, IIT-CNR  
Bogdan Carbunar, Florida International University  
Yusun Chang, Southern Polytechnic State University  
Yang Cui, Huawei Technologies  
Yan Dong, Huazhong University of Science and Technology  
Melike Erol-Kantarci, University of Ottawa  
Vasilis Friderikos, King's College London  
Bilal Gonen, University of West Florida  
Sassan Iraj, Aalto University  
Susumu Ishihara, Shizuoka University  
Evens Jean, Dynamics Research Corporation  
Wei Jiang, MS&T  
Burak Kantarci, University of Ottawa  
Krishna Kavi, University of North Texas  
Samee Khan, North Dakota State University

Sung-Min Lee, Samsung Electronics  
 Yong-Jin Lee, Korea National University of Education  
 Marco Levorato, Stanford University  
 Cheng Li, Memorial University of Newfoundland  
 Wenzhong Li, Nanjing University  
 Chong Luo, Microsoft Research Asia  
 Hsi-Pin Ma, National Tsing Hua University  
 Ivan Martinovic, University of Oxford  
 Liam Murphy, University College Dublin  
 Richard Pazzi, University of Ontario Institute of Technology  
 Luigi Pomante, University of L'Aquila  
 Sridhar Radhakrishnan, University of Oklahoma  
 Sahra Sedigh, Missouri University of Science and Technology  
 Abdallah Shami, The University of Western Ontario  
 Muidat Soyuturk, Istanbul Technical University  
 Marc St-Hilaire, Carleton University  
 Young-Joo Suh, Pohang University of Science and Technology  
 Djamshid Tavangarian, Universität Rostock  
 Begumhan Turgut, Rutgers University  
 Selcuk Uluagac, Georgia Institute of Technology  
 Guoqiang Wang, Yahoo  
 Guang-Hua Yang, The University of Hong Kong  
 Kai Zheng, IBM China Research Lab

---

---

## **Vehicular Communications and Networking: V2V, V2I, V2R, and V2U**

**Chair: David Matolak**, Ohio University

Onur Altintas, Toyota InfoTechnology Center  
 Oliver Klemp, BMW Group Research and Technology  
 Dimitrie Popescu, Old Dominion University  
 Christoph Sommer, University of Innsbruck

---

---

## **Green Communications and Computations**

**Chairs: Xi Zhang**, Texas A&M University

**F. Richard Yu**, Carleton University

Raffaele Bolla, University of Genoa  
 Bing Bu, Carleton University  
 Giovanna Carofiglio, Bell Labs, Alcatel-Lucent  
 Min Chen, Huazhong University of Science and Technology  
 Peter H. J. Chong, Nanyang Technological University  
 Alberto Conte, Alcatel-Lucent  
 Paul Cota, University of The District of Columbia  
 Anthony Ephremides, University of Maryland at College Park  
 Liqun Fu, The Chinese University of Hong Kong  
 Nasir Ghani, University of New Mexico  
 Kyle Guan, Bell Labs, Alcatel-Lucent  
 Carmen Guerrero, University Carlos III of Madrid  
 Ekram Hossain, University of Manitoba  
 Weisheng Hu, Shanghai Jiao Tong University  
 Yaohui Jin, Shanghai Jiaotong University  
 Christoph Lange, Deutsche Telekom AG  
 Jun Li, Communications Research Centre of Canada  
 Wei Lou, The Hong Kong Polytechnic University  
 Konstantina Papagiannaki, Telefonica Research  
 Achille Pattavina, Politecnico di Milano  
 Balaji Rengarajan, Institute IMDEA Networks  
 Catherine Rosenberg, University of Waterloo  
 Dario Rossi, Telecom ParisTech  
 Pengbo Si, Beijing University of Technology  
 Leandros Tassioulas, University of Thessaly

Yanwei Wang, Carleton University  
 Yifei Wei, Carleton University  
 Zhexiong Wei, Carleton University  
 Renchao Xie, Beijing University of Posts and Telecommunications  
 Honggang Zhang, Zhejiang University  
 Shunqing Zhang, Huawei Technologies, Co. Ltd.  
 Xiaoping Zheng, Tsinghua University

---

---

## **Telepresence & Tele-robot**

**Chairs: Cha Zhang**, Microsoft

**Ruigang Yang**, University of Kentucky

Harlyn Baker, Hewlett-Packard Labs  
 Pierre Boulanger, University of Alberta  
 Prasad Callyam, The Ohio State University  
 Chang Wen Chen, State University of New York, Buffalo  
 Gene Cheung, National Institute of Informatics  
 Carl Debono, University of Malta  
 Atanas Gotchev, Tampere University of Technology  
 JongWon Kim, GIST  
 Maja Matijasevic, University of Zagreb  
 Ibrahim Sezan, Sharp Laboratories of America  
 Kar-Han Tan, Hewlett-Packard  
 Binod Vaidya, University of Ottawa  
 Ji-Zheng Xu, Microsoft Research Asia  
 Zhenyu Yang, Florida International University  
 Heather Yu, Huawei Technologies  
 Chang Yuan, Sharp Labs of America  
 Junsong Yuan, Nanyang Technological University  
 Fan Zhai, Texas Instruments  
 Marcelo Zuffo, University of São Paulo

---

---

## **Intelligent and Emotion-oriented Computing**

**Chair: Youngsang Choi**, Samsung

Heeyoul Choi, Samsung Advanced Institute of Technology  
 K. Kishore Dhara, Avaya Labs Research  
 Ricardo Gutierrez-Osuna, Texas A&M University  
 Paul Jeon, Samsung Advanced Institute of Technology  
 Hyun-Jun Kim, Samsung Advanced Institute of Technology  
 Hosub Lee, Samsung Electronics  
 Pratibha Moogi, Samsung India Software Operation  
 Boris Motik, Oxford University  
 Guruprasad Seshadri, Tata Consultancy Services  
 Xiaotao Wu, Avaya Labs Research  
 Ji Soo Yi, Purdue University  
 Byoung-Tak Zhang, Seoul National University

---

---

## **3D Imaging, Processing, Communication and Display**

**Chairs: Du Sik Park**, Samsung Electronics

**Seungsin Lee**, Samsung Electronics

Atanas Gotchev, Tampere University of Technology  
 Changkyu Choi, Samsung Electronics  
 Chang-Su Kim, Korea University  
 Eric Diehl, Technicolor  
 Jun Arai, NHK  
 Dokyoon Kim, Samsung Electronics  
 Martin Banks, UC Berkeley  
 Namho Hur, ETRI  
 Radu Horaud, INRIA



# FRIDAY PROGRAM TUTORIALS & WORKSHOPS

Friday, January 11, 2013 • 08:30 – 12:00  
Room: Reno I

## **T1: Advances in Home Networking Standardization and Related Research Opportunities**

**Instructor:** Frank den Hartog (TNO, Netherlands)

Sometimes, the worlds of standardization and academic research seem far apart. However, home networking scientists and developers need to understand in which context their technology is expected to operate, in order to optimize the chance that their products will co-exist and interoperate with other systems in the consumer space. The focus of the tutorial will be on the role of standardization in the home networking field, how it works, what the main forces are, and why it is so opaque and complex. This will be illustrated in the light of current trends: the introduction of ICT from new domains (energy, health, ...) and the need for convergence and interoperability with ICT from established domains (telecom, consumer electronics, Internet). The second part of the tutorial will discuss the current status in home networking standardization: "official" bodies such as IEEE, ETSI, ISO/IEC, CENELEC, ITU, but also industry initiatives such as IETF, HGI, DLNA, UPnP Forum, Broadband Forum, Continua, PUCC, ATIS, DVB, Enocean Alliance, OSGi, CECED, DLMS, Zigbee Alliance, etc. The emphasis will be on the standards that are relevant

today, with a focus on new developments, such as IEEE-802.11ac and -1905.1, DLNA CVP, UPnP-HEMS, -DMS, and -EHS, DECT ULE, and G.hnem and G.phnt. The final hour will be spend on related research questions: architectures for convergence, co-existence issues, migration and scalability studies, etc.

Friday, January 11, 2013 • 08:30 – 12:00  
Room: Reno II

## **T2: Emerging Technologies for Future Tele-Communication**

**Instructors:** Cha Zhang (Microsoft Research, USA)  
Ruigang Yang (University of Kentucky, USA)

Telecommunication has become an integrated part of people's work and life. In this tutorial, we aim to provide an overview of some recent advances in technologies that enable more immersive telecommunication applications. Key topics covered by this tutorial include sound source localization from compact microphone arrays, 3D spatial sound and multi-channel echo cancellation, various real-time video processing techniques for enhancing conferencing experiences, and a few explorations on depth sensors in telecommunication applications.

Friday, January 11, 2013 • 08:30 – 12:00  
Room: Laughlin I

## **3rd Workshop on Consumer eHealth Platforms, Services and Applications**

**Chairs:** David Llewellyn-Jones and Madjid Merabti (Liverpool John Moores University, UK)

### **An Axiomatic Model For Formal Specification Requirements of Ubiquitous Healthcare Systems**

Amjad Gawanmeh  
(Khalifa University of Science, Technology and Research, UAE)

### **CloudHealth: Developing A Reliable Cloud Platform for Healthcare Applications**

Evan Hendrick, Brad Schooley, Chunming Gao  
(Michigan Technological University, USA)

### **The Design and Implementation of a Wireless Healthcare Application for WSN-enabled IMS Environments**

May El Barachi (Zayed University, UAE)  
Omar Alfandi (University of Goettingen, Germany)

### **Toward Enforcement of Purpose for Privacy Policy in Distributed Healthcare**

Annanda Thavymony Rath, Jean-Noel Colin  
(University of Namur, Belgium)

Friday, January 11, 2013 • 09:30 – 16:00  
Room: Virginia I

## **Touch of Genius – Script any Device with TouchDevelop**

**Chair:** Arjmand Samuel (Microsoft, USA)

TouchDevelop Web App is a development environment to create apps ON your tablet or smartphone. TouchDevelop has a predictive on-screen code keyboard and a general-purpose touch-optimized programming language. Scripts written by using TouchDevelop can access data, media, and sensors on the phone, tablet, and PC. Scripts can interact with cloud services, including storage, computing, and social networks. TouchDevelop lets you quickly create fun games and useful tools.

In this workshop, you can bring your own device (iPad, iPhone, Android phone or tablet, Windows phone, tablet or laptop) and create scripts to run on your device (we will have Windows Phones to borrow as well). We will have developers of TouchDevelop on hand to introduce you to this new environment. You can work in a group, or alone, and towards the end of the day submit an entry to be judged by a panel of distinguished judges. Winners take away cash prizes – now that is a Touch of Genius.

### **Program**

09:30 – 10:30: Tutorial: So what is TouchDevelop, and how can I use it? TouchDevelop Research Team  
10:30 – 11:00: Coffee and form teams  
11:00 – 16:00: Work on your projects and have lunch TouchDevelop Research Team on hand to answer any questions  
16:00: Submit your TouchDevelop scripts

**Finalists will be announced at the Conference Banquet!**

# FRIDAY PROGRAM

## TUTORIALS & WORKSHOPS • OPENING RECEPTION

### TUTORIALS

Friday, January 11, 2013 • 13:00 – 16:30

Room: Reno I

#### **T3: Erasure Coding Meets Three Screens and the Cloud**

**Instructor: Cheng Huang** (Microsoft Research, USA)

The demand for smooth experience cross three screens (PC, TV and Phone) is all-time high. This becomes possible with the rapid advancement of the Cloud. Three screens and the cloud together unleash tremendous opportunities by enabling new application scenarios and services. However, the expectation of such applications and services is also more demanding than ever – snappy responsiveness and superior quality at extremely affordable costs. Erasure coding is being rediscovered as a crucial technology to meet the high expectation of these emerging application scenarios and services.

In this tutorial, I will cover the basics of erasure coding and introduce several popular classes of erasure codes, including MDS codes (Reed-Solomon codes and array codes), network codes and storage codes. We walk through a series of application scenarios and services, where erasure coding is innovatively applied to derive solutions offering snappy responsiveness and superior quality at extremely affordable costs. The application scenarios and services cover i) social gaming; ii) content distribution; iii) vehicle communication; iv) virtualization and consolidation; and v) cloud storage.

Friday, January 11, 2013 • 13:00 – 16:30

Room: Reno II

#### **T4: MirrorLink™ and Co – Connecting Your Smart Phone to Your Car**

**Instructors: Jörg Brakensiek** (Nokia Location & Commerce, USA)

The combination of the application store phenomenon and rapidly evolving hardware and software capabilities has transformed smartphones into the electronic equivalent of a Swiss Army knife. Smartphones provide services ranging from navigation to entertainment, and mobile applications make that content accessible anytime, anywhere.

However, automobiles remain the one environment where most people have seen little change in accessibility due to safety concerns. Many have resorted to the dangerous habit of using their handheld mobile devices while driving, sparking new laws aimed at reducing the number of distracted drivers. But as societies have become more industrialized, the amount of time people spend in their vehicles has increased sharply. Even if users are willing to install expensive in-vehicle infotainment (IVI) systems or head units, they're usually restricted to a limited number of applications provided by the car manufacturer because of the closed and specialized nature of existing platforms.

The automotive industry has started addressing this challenging, introducing various concepts to allow some level smartphone integration into some of their models, like Ford Sync, BMW MiniConnect or Harman Aha and many more.

The Car Connectivity Consortium ([www.carconnectivity.com](http://www.carconnectivity.com)) has developed MirrorLink™ to address this challenge providing a global approach, not limited by any proprietary solutions. MirrorLink™ allows smartphones to self-integrate into IVI systems, transforming them from mobile application platforms into automotive application platforms. The technology allows for rich, high-resolution graphical user-interfaces. It opens up opportunities to develop and deploy mobile applications that are customized for in-vehicle use while maintaining a safe user experience, integrating an Application Certification program.

### WORKSHOPS

Friday, January 11, 2013 • 13:30 – 18:00

Room: Laughlin I

#### **Workshop on Internet of Things- RFIDs, WSNs and Beyond**

**Chair: Mohamed Watfa** (University of Wollongong, Dubai, UAE)

##### **DORMS: Design of multi-Objective Optimized RPL and MAC Protocols for Wireless Sensor Network Applications**

Anwar Al-Khateeb (Politecnico Di Torino, Italy)

##### **Modeling and Implementation of SIP and EPC Protocols in Airline Luggage Tracking Applications**

Anwar Al-Khateeb (Politecnico Di Torino, Italy)

##### **Performance Analysis of Routing Protocols in Zigbee Non-Beacon Enabled Wireless Sensor Networks**

Adam Dahlstrom, Ramesh Rajagopalan (University of Saint Thomas, USA)

##### **Performance Analysis of Source Specific Multicast over Internet Protocol version 6 with Internet Protocol Version 4 in a Test Bed**

Mohammad Ahsan Chishti, Ashaq Majid Ahanger, Shaima Qureshi, Ajaz H. Mir (National Institute of Technology Srinagar, India)

##### **RFID System Implementation in Jebel Ali Port**

Mohamed Watfa

(University of Wollongong / American University of Beirut, Lebanon)

##### **Sensor Networks in Future Smart Rotating Buildings**

Kamal Jaafar (University of Wollongong, Dubai, UAE)

Friday, January 11, 2013 • 13:30 – 18:00

Room: Laughlin III

#### **1st Workshop on People Centric Sensing and Communications**

**Chairs: Hosub Lee** (Samsung, USA)

**John Buford** (Avaya Labs, USA)

##### **A Game Theory Model for Situation Awareness and Management**

Mark D. Rahmes, Kathy Wilder, Kevin Fox, Rick Pemble (Harris Corporation, USA)

##### **Activity Recognition Using Smartphone Sensors**

Alvina Anjum, Muhammad Usman Ilyas

(National University of Sciences & Technology, Pakistan)

##### **Gossipmule: Improving Association Decisions via Opportunistic Recommendations**

Mónica Alejandra Lora, Alexander Paulus, Klaus Wehrle (RWTH Aachen University, Germany)

##### **Improved Transient Weather Reporting Using People Centric Sensing**

William D. Phillips, Ravi Sankar (University of South Florida, USA)

##### **Leveraging Real-world Data While Protecting Privacy - Framework Using Personal Agent System for Distributed Data**

Tomohiro Inoue, Taichi Kawabata, Hiroyuki Maeomichi, Mika Ishizuka, Koichi Takasugi, Akihiro Tsutsui, Ikuo Yoda (NTT, Japan)

Friday, January 11, 2013 • 18:30 – 20:00

Room: Scenic Room

## Opening Reception



# SATURDAY PROGRAM

## KEYNOTE • TECHNICAL SESSIONS

Saturday, January 12, 2013 • 08:30 – 09:00  
Room: Vista Room

### Opening & Keynote Address



### *Vision of Wireless Consumer Communications*

**Donald L. Schilling**  
Chairman, LINEX Technologies

*See page 20 for abstract.*

Saturday, January 12, 2013 • 09:30 – 11:30  
Room: Laughlin II

### Best Paper Candidate Talk

**Chair: Eunsoo Shim** (Samsung, Korea)

#### **Dynamic Media Streaming with Predictable Reliability and Opportunistic TCP-Friendliness**

Manuel Gorius, Yongtao Shuai, Thorsten Herfet  
(Saarland University, Germany)

#### **Estimation of QoE of Video Traffic using a Fuzzy Expert System**

Jeevan Pokhrel (Telecom Sud Paris, France)  
Bachar Wehbi (Montimage, France)  
Anderson Morais (Telecom SudParis, France)  
Ana Cavalli (INT Evry, France)  
Eric Allilaire (Vierling, France)

#### **MOVi: Opportunity Extension for Mobile Peer-to-peer Video on Demand**

Hyun Lee, Jae-Yong Yoo, JongWon Kim  
(Gwangju Institute of Science & Technology, Korea)

#### **QoE-based Resource Reservation for Unperceivable Video Quality Fluctuation during Handover in LTE**

Mohammed Shehada, Bo Fu, Srisakul Thakolsri  
(DoCoMo Euro-Labs, Germany)  
Wolfgang Kellerer (Technische Universität München, Germany)

#### **A Multidimensional Heuristic for Social Routing in Peer-to-Peer Networks**

Shuo Jia, Pierre T. St. Juste, Renato Figueiredo  
(University of Florida, USA)

Saturday, January 12, 2013 • 09:30 – 11:30  
Room: Reno I

### Peer-to-Peer

**Chair: Chai Kiat Yeo** (Nanyang Technological University, Singapore)

#### **A Hybrid Peer Selection Scheme for Enhanced Network and Application Performances**

Xu Zhang, Ning Wang, Michael P. Howarth (University of Surrey, UK)

#### **Dual-Metric Hybrid Protocol for Application Level Multicast for Live Video Streaming**

Chai Kiat Yeo, Yang Xia, Bu Sung Lee, Yuanyuan Mao,  
Ing Yann Soon, Zoebir Bong  
(Nanyang Technological University, Singapore)

#### **Hamming DHT: Taming the Similarity Search**

Rodolfo da Silva Villaca (State University of Campinas, Brazil)  
Luciano Bernardes de Paula (IFSP, Brazil)  
Rafael Pasquini (Federal University of Uberlândia, Brazil)  
Mauricio Ferreira Magalhaes (State University of Campinas, Brazil)

#### **Hincent: Quick Content Distribution With Priorities and High Incentives**

Debessay Fesehay Kassa, Klara Nahrstedt  
(University of Illinois, Urbana-Champaign, USA)

Saturday, January 12, 2013 • 09:30 – 11:30  
Room: Reno II

### Wireless Networking I

**Chair: Song Ci** (University of Nebraska-Lincoln, USA)

#### **A Cognitive Link Adaptation Strategy with Differentiated Responses on Wi-Fi System-on-Chip**

Taeyoung Lee, Myounghwan Lee, Jaeeun Kang, Kyungik Cho,  
Chil-Youl Hacky Yang, Scott Seongwook Lee (Electronics, Korea)

#### **Cost-efficient Multicast Over Coded Packet Wireless Networks Using Data Envelopment Analysis**

Adeyemi Abel Ajibesin, Neco Ventura, Alexandru Murgu  
(University of Cape Town, South Africa)  
H Anthony Chan (Huawei Technologies, USA)

#### **Power Allocation Framework for OFDMA-based Relay-Enhanced Cellular Networks**

Yalda Farazmand, Attahiru S. Alfa (University of Manitoba, Canada)

#### **Priority Inversion and Queue Management for 802.11 Priority WLANs**

William L. Formyduval, David Thuente  
(North Carolina State University, USA)

#### **Transparent Cross-Layer Solutions for Throughput Boost in Cognitive Radio Networks**

Muhammad Faisal Amjad (University of Central Florida, USA)  
Baber Aslam (National University of Sciences and Technology, Pakistan)  
Cliff Zou (University of Central Florida, USA)

Saturday, January 12, 2013 • 09:30 – 11:30  
Room: Laughlin I

### Wireless Communication I

**Chair: Youngsoo Kim** (Samsung, Korea)

#### **An Efficient Downlink Packet Scheduling Algorithm for Real Time Traffics in LTE Systems**

Bin Liu, Hui Tian, Lingling Xu  
(Beijing University of Posts and Telecommunications, China)

#### **Cooperative Precoding with Limited Feedback in Multi-user Cognitive MIMO Networks**

Gui Xin, Guixia Kang, Ping Zhang  
(Beijing University of Posts and Telecommunications, China)

#### **Impact of Network Coding on Delay and Throughput in Practical Wireless Chain Topologies**

Martin Hundebøll, Stephan Alexander Rein, Frank H.P. Fitzek  
(Aalborg University, Denmark)

#### **Optimal Power Allocation for Coordinated Wireless Backhaul in OFDM Based Relay Systems**

Bing Luo (Beijing University of Posts and Telecommunications, China)  
Jinxia Sun, Wenyan Jin (CMCC, China)

#### **Design and Evaluation of RFID Counting Algorithms under Time-correlated Channels**

Yulin Deng, Wing Cheong Lau, On Ching Yue  
(Chinese University of Hong Kong, Hong Kong)

# SATURDAY PROGRAM

## DEMOS • TECHNICAL SESSIONS

Saturday, January 12, 2013 • 12:30 – 13:30  
Room: Scenic Room

### Demonstrations

See pages 24-26 for demo descriptions.

Saturday, January 12, 2013 • 13:30 – 15:30  
Room: Laughlin II

### Best Paper Candidate Talk

Chair: Rob Fish (NETovations, LLC, USA)

#### A Nash-Stackelberg Multiplicative Weighted Imitative CODIPAS-RL Scheme

Muhammad Shoaib Saleem, Eric Renault  
(Telecom & Management SudParis, France)

#### Asymmetric Resource Allocation for OFDMA Networks with Collaborative Relays

Zheng Chang, Tapani Ristaniemi (University of Jyväskylä, Finland)

#### Design and Analysis of a Cluster-based Calcium Signaling Network Model

Yiqun Yang, Chai Kiat Yeo  
(Nanyang Technological University, Singapore)

#### P-ARQ: Controllable PLL ARQ method for wireless low power communication

Hyosun Hwang, Jaesup Lee, ChiSung Bae, Young-Jun Hong  
(Samsung Electronics, Korea)  
Nak-Myeong Kim (Ewha Woman University, Korea)

#### WFICC: A New Mechanism for Provision of QoS and Congestion Control in WiMAX

Fatima Furqan, Doan B. Hoang  
(University of Technology, Sydney, Australia)

Saturday, January 12, 2013 • 13:30 – 15:30  
Room: Laughlin I

### Wireless Communication II

Chair: Wing Cheong Lau

(Chinese University of Hong Kong, Hong Kong)

#### A Structured Approach to Optimization of Energy Harvesting Wireless Sensor Networks

Nicholas Roseveare, Bala Natarajan (Kansas State University, USA)

#### Decentralized Multi-Cell Beamforming with Base Station Cooperation

Siddharth Deshmukh, Sayak Bose, Bala Natarajan  
(Kansas State University, USA)

#### Interaction between Isolated Resonators in Near Field Channel

Sang Joon Kim, Seung Keun Yoon, Uikun Kwon  
(Samsung Electronics, Korea)

#### NPA: Protocol for Secure Communications in GSM Cellular Network

Neetesh Saxena, Narendra S. Chaudhari  
(Indian Institute of Technology Indore, India)

#### PHY Front End Design for Emerging 60 GHz Multi-Gigabit Wireless Devices

Lochan Verma, Mohammad Fakharzadeh  
(Peraso Technologies Inc., Canada)

Saturday, January 12, 2013 • 13:30 – 15:30  
Room: Reno I

### Sensor Network I

Chair: Youngsoo Kim (Samsung, Korea)

#### A Robust Wearable Health Monitoring System Based on WSN

Young Hwan Kim, Kuk Jin Jang, Seung-chul Lee, Chang Won Park  
(Korea Electronics Technology Institute, Korea)  
Hee Yong Youn (Sungkyunkwan University, Korea)

#### Energy-Efficient Data Collection in Multiple Mobile Gateways WSN-MCN Convergence System

Fei Yin, Zhenhong Li, Haifeng Wang  
(Renesas Mobile Corporation, China)

#### Energy-Efficient Two-Dimensional Skyline Query Processing in Wireless Sensor Networks

Yohan Roh (SAIT, Samsung Electronics, Korea)  
In-Chul Song  
(Korea Advanced Institute of Science and Technology, Korea)  
Joo Hyuk Jeon, Kyoung-Gu Woo (SAIT, Samsung Electronics, Korea)  
Myoung Ho Kim  
(Korea Advanced Institute of Science and Technology, Korea)

#### Multi-Channel Multi-Path Video Transmission over Wireless Sensor Networks

Syed Muhammad Asad Zaidi, Jieun Jung, Byunghun Song,  
Hyung Su Lee (Korea Electronics Technology Institute, Korea)  
Hee Yong Youn (Sungkyunkwan University, Korea)

#### Resource Management in Visual Sensor Networks using Nash Bargaining Solution in Generalized Fading

Olusegun O. Odejide (Prairie View A&M University, USA)  
Elizabeth Bentley (AFRL/RI, Vietnam)  
Lisimachos P. Kondi (University of Ioannina, Greece)  
John D. Matyjas (Air Force Research Laboratory, USA)

Saturday, January 12, 2013 • 13:30 – 15:30  
Room: Reno II

### Multimedia Networking I

Chair: Marie-Jose Montpetit (MIT, USA)

#### A Multidimensional QoE Monitoring System for Audiovisual and Haptic Interactive IP Communications

Eiichi Isomura, Shuji Tasaka, Toshiro Nunome  
(Nagoya Institute of Technology, Japan)

#### An Adaptive TCP Congestion Control having RTT-Fairness and Inter-Protocol Friendliness

Yohei Nemoto, Kazumine Ogura, Jiro Katto (Waseda University, Japan)

#### Analysis of Synchronization Issues for Live Video- Context Transmission Service

Houssein Wehbe, Ahmed Bouabdallah  
(Institut Mines-Telecom - Telecom Bretagne, France)  
Bruno Stevant (Telecom Bretagne, France)  
Usama Mir (Institut Mines-Telecom - Telecom Bretagne, France)

#### Prototype Implementation of a Visual Communication System Employing Video Imagery

Scott Kuzdeba (BAE Systems, USA)  
Alexander M. Wyglinski (Worcester Polytechnic Institute, USA)  
Brandon Hombs (BAE Systems, USA)

#### Utility Function for Predicting IPTV Quality of Experience Based on Delay in Overlay Networks

Imad Abdeljaouad, Ahmed Karmouch  
(University of Ottawa, Canada)



# SATURDAY PROGRAM

## PANEL • TECHNICAL SESSIONS • KEYNOTE • DEMOS

Saturday, January 12, 2013 • 16:00 – 17:00  
Room: Laughlin III

### Home Energy Management Networking Panel

Electricity grids are being upgraded very rapidly and become "smart." Electricity consuming, producing, and measuring devices in people's homes are expected to carry an important part of the Smart Grids' intelligence. But related network architectures and protocols are still in their infancy. In a highly interactive session, the panelists will share their view on the future developments and research needs in home energy management networking.

#### Panelists:

**Duncan Bees** (CTO, HGI)  
**Don Dulchinos** (Senior VP, Cable Labs)  
**Arjen Noorbergen** (CTO, Quby)  
**Varun Nagaraj**  
(Senior VP, Product Management & Marketing, Echelon)

Saturday, January 12, 2013 • 16:00 – 17:40  
Room: Reno I

### Green Communication

**Chair: Hyo Seok Yi** (Harvard, USA)

#### 2D Sliced Packet Buffer with Traffic Volume and Buffer Occupancy Adaptation for Power Saving

Kenzo Okuda, Shingo Ata (Osaka City University, Japan)  
Yasuto Kuroda, Yuji Yano, Hisashi Iwamoto  
(Renesas Electronics Corporation, Japan)  
Kazunari Inoue, Ikuo Oka (Osaka City University, Japan)

#### Energy-Efficient Base-Station Topologies for Green Cellular Networks

Won-Yong Shin (Dankook University, Korea)  
Hyo Seok Yi, Vahid Tarokh (Harvard University, USA)

#### On Effective Data Aggregation Techniques in Host-based Intrusion Detection in MANET

Difan Zhang, Linqiang Ge (Towson University, USA)  
Rommie Hardy (US Army Research Lab, USA)  
Hanlin Zhang, Wei Yu (Towson University, USA)  
Robert J Reschly, Jr. (US Army Research Lab, USA)

#### Towards Energy-Efficient Cooperative Routing Algorithms in Wireless Networks

Yu Wang, Xinyu Yang (Xi'an Jiaotong University, China)  
Shusen Yang (Imperial College London, UK)  
Wei Yu, Sulabh Bhattarai (Towson University, USA)  
Dan Shen, Genshe Chen (Intelligent Fusion Technology, Inc, USA)

Saturday, January 12, 2013 • 16:00 – 17:40  
Room: Reno II

### 3D Imaging

**Chair: Seok Lee**

(Samsung Advanced Institute of Technology, Korea)

#### Interactive Manipulation and Visualization of a Deformable 3D Organ Model for Medical Diagnostic

Hyong-Euk Lee, Nahyup Kang, Jae-Joon Han, Kyung Hwan Kim,  
James D. K. Kim (Samsung Advanced Institute of Technology, Korea)

#### Low Complexity Independent Multi-View Video Coding

Hany Hussein  
(Egypt-Japan University for Science and Technology, Japan)  
Mostafa El-Khamy (Alexandria University, Egypt)  
Farhad Mehdipour (Kyushu University, Japan)  
Mohamed El-Sharkawy  
(Purdue School of Engineering and Technology, USA)

#### Depth Resampling for Mixed Resolution Multiview 3D Videos

Seok Lee, Seungsin Lee, Hochen Wey, Jaejoon Lee, Dusik Park  
(Samsung Electronics, Korea)

Saturday, January 12, 2013 • 16:00 – 17:40  
Room: Laughlin I

### Vehicle Network

**Chair: Satoshi Makido** (Toyota Central R&D Labs, Japan)

#### Compressive Sensing Based Image Transmission for Multiuser V2X Communications

Satoshi Makido, Masaki Takanashi  
(Toyota Central R&D Labs., Inc., Japan)

#### Dynamic Service-Channels Allocation (DSCA) in Vehicular Ad Hoc Networks

Sung Jin Park (Georgia Institute of Technology, USA)  
Yusun Chang (Southern Polytechnic State University, USA)  
Faisal Ahmad Khan, John A. Copeland  
(Georgia Institute of Technology, USA)

#### Stability Analysis of Congestion Control Schemes in Vehicular Ad Hoc Networks

Neda Nasiriani, Yaser P. Fallah (West Virginia University, USA)  
Hariharan Krishnan (General Motors, USA)

## Keynote Address

Saturday, January 12, 2013  
18:00 – 19:00  
Room: Vista Room



### Smart Life with Convergence

**Kilsu Eo**

Executive Vice President, Samsung  
Convergence Solution Team,  
Software R&D Center  
User Experience Center, DMC R&D Center

See page 21 for abstract.

## Happy Hour Demonstrations

Saturday, January 12, 2013  
19:00 – 20:00  
Room: Scenic Room

PANEL

TECHNICAL SESSIONS

KEYNOTE



# SUNDAY PROGRAM

## KEYNOTE • TECHNICAL SESSIONS

Sunday, January 13, 2013 • 08:30 – 09:30  
Room: Vista Room

### Keynote Address (Microsoft)

### Award Presentations



### SDN in Windows Azure Cloud

**Albert Greenberg**  
Partner Development Manager  
Microsoft

Sunday, January 13, 2013 • 10:00 – 12:00  
Room: Laughlin II

### Best Paper Candidate Talk

**Chair: Alexander Gelman** (NETovations, LLC, USA)

#### Plane Segmentation and Decimation of Point Clouds for 3D Environment Reconstruction

Lingni Ma, Raphael J.J. Favier, Luat Do, Egor Bondarev, Peter H.N. de With (Eindhoven University of Technology, Netherlands)

#### Energy Efficiency of Collaborative OFDMA Mobile Clusters

Zheng Chang, Tapani Ristaniemi (University of Jyväskylä, Finland)

#### Everyday Mobility Context Classification using Radio Beacons

Minyoung Mun (SAIT, Samsung Electronics, Korea)

#### Distributed Autonomous Multi-Hop Vehicle-to-Vehicle Communications over TV White Space

Yutaka Ihara, Haris Kremo, Onur Altintas, Hideaki Tanaka (Toyota InfoTechnology Center, Japan)

Masaaki Ohtake, Takeo Fujii

(University of Electro-Communications, Japan)

Chikara Yoshimura, Keisuke Ando, Kazuya Tsukamoto,

Masato Tsuru, Yuji Oie (Kyushu Institute of Technology, Japan)

#### Goodput Improvement for Multipath TCP by Congestion Window Adaptation in Multi-Radio Devices

Dizhi Zhou, Wei Song (University of New Brunswick, Canada)

Minghui Shi (Industry Canada, Canada)

Sunday, January 13, 2013 • 10:00 – 12:00  
Room: Reno II

### Multimedia Networking II

**Chair: James Martin** (Clemson University, USA)

#### CoCam: A Collaborative Content Sharing Framework Based on Opportunistic P2P Networking

Eyal Toledano, Henry Holtzman, Andrew Lippman, Federico Casalegno, Dan Sawada (MIT, USA)

#### Characterizing Netflix Bandwidth Consumption

Jim Martin, Yunhui Fu, Nicholas Wourms (Clemson University, USA)

Terry Shaw (Cable Television Laboratories, Inc., USA)

#### Experience with Collaborative Conferencing Applications in Named-Data Networks

Jun Wei (Huawei Technologies, USA)

Duy D. Nguyen (University of California, Santa Cruz, USA)

J. J. Garcia-Luna-Aceves (PARC, USA)

Kathleen Nichols (Pollere, Inc, USA)

#### Packet Wait Times in Voice over IP Wireless Reverse Links

Richard Framjee, Jonathan Bredow (University of Texas, Arlington, USA)

#### Perceptual Quality Driven Cross-Layer Optimization for Wireless Video Streaming

Pinghua Zhao, Yanwei Liu, Ruixiao Yao

(Chinese Academy of Sciences, China)

Song Ci (University of Nebraska-Lincoln, USA)

Hui Tang (Chinese Academy of Sciences, USA)

Sunday, January 13, 2013 • 10:00 – 12:00  
Room: Laughlin I

### Wireless Communication III

**Chair: David Stynes** (University College Cork, Ireland)

#### A Novel Network Coded Relay-Assisted Hybrid-ARQ Scheme

Yue Ma, Lihua Li, Jin Jin, Yijing Liu

(Beijing University of Posts and Telecommunications, China)

#### AGC and ADC Effects on Receiver Performance in FDM based Narrowband Wireless Systems

Shusuke Narieda (Akashi National College of Technology, Japan)

#### Cooperative Code-sharing for UMTS Femtocells

David Stynes, Kenneth N. Brown (University College Cork, Ireland)

Eric Jul (Bell Labs, Alcatel-Lucent Ireland Ltd, Ireland)

#### Managing Downlink Multi-User MIMO Transmission Using Group Membership

Osama Aboul-Magd (Hauwei Technologies, Canada)

Uikun Kwon, Youngsoo Kim (Samsung Electronics, Korea)

Chunhui Zhu (Samsung Electronics, USA)

#### Minimizing Transmit Power for Cooperative Multicell System with Massive MIMO

Jinkyu Kang, Joonhyuk Kang (KAIST, Korea)

Namjeong Lee, Byung Moo Lee, Jongho Bang (Samsung, Korea)

Sunday, January 13, 2013 • 10:00 – 12:00  
Room: Laughlin III

### Social Networking/Security

**Chair: Marie-Jose Montpetit** (MIT, USA)

#### Denial of Convenience Attack to Smartphones Using a Fake Wi-Fi Access Point

Erich Dondyk, Cliff Zou (University of Central Florida, USA)

#### JURD: Joiner of Un-Readable Documents to Reverse Tokenization Attacks to Content-based Spam Filters

Igor Santos, Carlos Laorden, Borja Sanz, Pablo Garcia Bringas (University of Deusto, Spain)

#### Towards Practical Privacy-preserving Digital Rights Management for Cloud Computing

Ronald Petrlic (University of Paderborn, Germany)

Nakul Joshi (University of Southern California, USA)

#### Enabling Decentralized Microblogging through P2PVPNs

Pierre T. St. Juste, Heungsik Eom, Kyungyong Lee, Renato

Figueiredo (University of Florida, USA)

# SUNDAY PROGRAM

## TECHNICAL SESSIONS • DEMOS

### **ContextController: Augmenting Broadcast TV with Real-Time Contextual Information**

Robert Hemsley, Arlene Ducao, Eyal Toledano, Henry Holtzman  
(MIT Media Lab, USA)

Sunday, January 13, 2013 • 13:30 – 14:00  
Room: Scenic Room

### **Demonstrations**

See pages 24-26 for demo descriptions.

DEMOS

Sunday, January 13, 2013 • 14:00 – 16:00  
Room: Reno II

### **Wireless Networking II**

**Chair: Wei Yu** (Townson University, USA)

#### **A Novel Wireless Network Access Selection Scheme For Heterogeneous Multimedia Traffic**

Abolfazl Mehbodniya (Tohoku University, Japan)  
Faisal Kaleem, Kang Yen (Florida International University, USA)  
Fumiyuki Adachi (Tohoku University, Japan)

#### **Congestion-based Automatic Calling for Improving Call Establishment in VoLTE**

Satoshi Komorita, Yoshinori Kitatsuji, Hidetoshi Yokota  
(KDDI Labs, Japan)

#### **Formation of Cooperative Cluster for Coordinated Transmission in Multi-Cell Wireless Networks**

Jung-Min Moon, Dong-Ho Cho  
(Korea Advanced Institute of Science and Technology, Korea)

#### **Group Size Studies for Collaborated Sensors/Robots**

Bo Fu, Yang Xiao (University of Alabama, USA)

#### **Min-Cut Based Partitioning for Urban LTE Cell Site Planning**

Alexander Engels, Michael Reyer, Andreas Steiger, Rudolf Mathar  
(RWTH Aachen University, Germany)

Sunday, January 13, 2013 • 14:00 – 16:00  
Room: Reno I

### **Mobile Device & Application**

**Chair: Ben Falchuk** (Applied Communication Sciences, USA)

#### **Android App For Intelligent CBM**

Sonal Dixit, Nishchal Verma, Rahul K. Sevakula, Sumit Sarkar  
(IIT Kanpur, India)

#### **Do Android Users Write About Electric Sheep? Examining Consumer Reviews in Google Play**

Elizabeth Ha, David Wagner (UC Berkeley, USA)

#### **Instant Search-based Indoor Localization**

Truc Le (University of Missouri, USA)  
Nam Tuan Nguyen (University of California, Los Angeles, USA)  
Thong Doan, Han Dinh (Ho Chi Minh University of Science, Vietnam)

#### **Mobile Applications and Algorithms to Facilitate Electric Vehicle Deployment**

Yuhuan Du, Gustavo de Veciana (University of Texas, Austin, USA)

#### **PIOS: A Platform-Independent Offloading System for a Mobile Web Environment**

Sehoon Park, Qichen Chen, Heon Y. Yeom  
(Seoul National University, Korea)

Sunday, January 13, 2013 • 14:00 – 16:00

Room: Laughlin I

### **Wireless Communication IV**

**Chair: Jaspreet Singh** (Samsung, USA)

#### **Channel-Adaptive Sensing Strategy for Cognitive Radio Ad Hoc Networks**

Yuan Lu, Alexandra Duel-Hallen (North Carolina State University, USA)

#### **GF(q) LDPC Decoder Design for FPGA Implementation**

Wojciech Sulek, Marcin Kucharczyk, Grzegorz Dziwoki  
(Silesian University of Technology, Poland)

#### **Low-Complexity Optimal CSI Feedback in LTE**

Jaspreet Singh, Zhouyue Pi, Hoang Nguyen  
(Samsung Telecom America, USA)

#### **Optimal Spectrum Allocation Considering the Heterogeneity of Channel and Secondary Users**

Wenjie Zhang, Chai Kiat Yeo, Yifan Li  
(Nanyang Technological University, Singapore)

#### **Bluetooth Positioning using RSSI and Triangulation Methods**

Yapeng Wang  
(MPI-QMUL Information System Research Centre, Macao)  
Xu Yang (Macau Polytechnic Institute, Macao)  
Yutian Zhao  
(Beijing University of Posts and Telecommunications, China)  
Yue Liu, Laurie Cuthbert (Queen Mary, University of London, UK)

TECHNICAL SESSIONS

# SUNDAY PROGRAM

## DEMOS • TECHNICAL SESSIONS • KEYNOTE

DEMOS

Sunday, January 13, 2013 • 15:30 – 16:30  
Room: Scenic Room

### Demonstrations

See pages 24-26 for demo descriptions.

### Sensor Network II

Chair: **Yang Xiao** (University of Alabama, USA)

#### A Novel Clustering Paradigm for Key Pre-distribution: Toward a Better Security in Homogenous WSNs

Mohammad Rezaeirad, Mahdi Orooji, Sahar Mazloom,  
Dimitri Perkins, Magdy Bayoumi (University of Louisiana, USA)

#### Impact of Antenna Directionality and Energy Harvesting Rate on Neighbor Discovery in EH-IoTs

Shruti Devasenapathy, R Venkatesha Prasad,  
Vijay Sathyanarayana Rao, Ignas Niemegeers (TU Delft, Netherlands)

#### Selective Context Fusion Utilizing an Integrated RFID-WSN Architecture

Abdulrahman Abahsain, Ashraf E. Al-Fagih, Sharief M.A. Oteafy,  
Hossam S. Hassanein (Queen's University, Canada)

#### Digital Pheromone Based Patrolling Algorithm in Wireless Sensor and Actuator Networks

Yanping Zhang, Yang Xiao (University of Alabama, USA)

Sunday, January 13, 2013 • 16:30 – 18:10  
Room: Laughlin I

### Intelligent and Emotion-oriented Computing

Chair: **Young Sang Choi** (Samsung, Korea)

#### Window-based Streaming Video-on-Demand Transmission on BitTorrent-Like Peer-to-Peer Networks

Mario E. Rivero-Angeles (Instituto Politecnico Nacional, Mexico)  
Gerardo Rubino (INRIA, France)  
Ivan Omar Olguín Torres, Luis Antonio Martinez  
(UPIITA - IPN, Mexico)

#### Echo State Queueing Network: A New Reservoir Computing Learning Tool

Sebastián Basterrech, Gerardo Rubino (INRIA, France)

#### Production Features for Detection of Shouted Speech

Vinay Kumar Mittal, Yegnanarayana B.  
(International Institute of Information Technology, Hyderabad, India)

#### A New Posture Monitoring System for Preventing Physical Illness of Smartphone Users

Hosub Lee, Sunjae Lee, Youngsang Choi, Youngwan Seo,  
Eunsoo Shim (Samsung Electronics, Korea)

Sunday, January 13, 2013 • 16:30 – 18:10  
Room: Reno II

### eHealth & Ambient Assisted Living

Chair: **Jonghoon Youn** (University of Nebraska, Omaha, USA)

#### Monitoring for Disease Progression via Mathematical Time-series Modeling

Ha-Young Kim, Hye Jin Kam, Jihyun Lee, Sanghyun Yoo,  
Kyoung-Gu Woo (SAIT, Samsung Electronics, Korea)  
Jai Sung Noh, Seungmin Yoo  
(Ajou University School of Medicine, Korea)

#### On-board Processing of Acceleration Data for Real-time Activity Classification

Sangil Choi, Richelle LeMay, Jong-Hoon Youn  
(University of Nebraska, Omaha, USA)

#### Real Life Applicable Fall Detection System Based on Wireless Body Area Network

Woon-Sung Baek, Dong-Min Kim, Faisal Bashir, Jae-Young Pyun  
(Chosun University, Korea)

TECHNICAL SESSIONS

KEYNOTE

Sunday, January 13, 2013 • 19:00 – 21:00  
Room: Vista Room

### Banquet & Keynote Address



### Game Changers of Future Consumer Communications

**I.P. Park**  
Executive Vice President & CTO  
HARMAN International

See page 23 for abstract.

# MONDAY PROGRAM

## TUTORIAL • WORK-IN-PROGRESS SESSIONS

TUTORIAL

WORK-IN-PROGRESS SESSIONS

Monday, January 14, 2013 • 08:30 – 12:00  
Room: Virginia II

### **T5: Vehicular Networking: Applications, Standards, Protocols, Deployment Plans and Open Issues**

**Instructors:** **Onur Altintas** (Toyota Info Technology Center, Japan)  
**Falko Dressler** (University of Innsbruck, Austria)

Vehicular networking serves as one of the most important enabling technologies required to implement a myriad of applications related to vehicles, vehicle traffic, drivers, passengers and pedestrians. Much progress has been achieved in this area during the past decade. In this tutorial, we will look into applications and use cases of vehicular networking followed by an overview of the standardization activities. Next we will cover the communication protocol design as well as the deployment plans. We will also briefly talk about simulation tools for evaluation of various protocol designs. Before concluding, we will take a glimpse at the recently emerging reality of electric vehicles and issues surrounding them. Finally, we will conclude with open issues that require further research.

Monday, January 14, 2013 • 10:00 – 12:00  
Room: Laughlin I

### **Wireless Communication I**

**Chair:** **Jae-Young Pyun** (Chosun University, Korea)

#### **BRAEVE: Stable and Adaptive BSM Rate Control over IEEE802.11p Vehicular Networks**

Kazumine Ogura, Jiro Katto (Waseda University, Japan)  
Mineo Takai (University of California, Los Angeles, Japan)

#### **Coordinator Assisted Passive Discovery for Mobile End Devices in IEEE 802.15.4**

Faisal Bashir, Woon-Sung Baek, Pranesh Sthapit, Dinesh Pandey, Jae-Young Pyun (Chosun University, Korea)

#### **Estimation of Overlay Link Quality from Previously Observed Link Qualities**

Weihua Sun (Nara Institute of Science and Technology, Japan)  
Naoki Shibata (Shiga University, Japan)  
Keiichi Yasumoto (Nara Institute of Science and Technology, Japan)  
Masaaki Mori (Shiga University, Japan)

#### **Joint Resource Allocation in OFDMA-Based Relay Systems under Mutual Interference Constraint**

Solmaz Niknam (Iran University of Science and Technology, Iran)  
S. Eman Mahmoodi (Stevens Institute of Technology, USA)  
Bahman Abolhassani (Iran University of Science and Technology, Iran)

#### **Performance Impact of Pilot Tone Randomization to Mitigate OFDM Jamming Attacks**

Chowdhury Shahriar, Robert McGwier, T. Charles Clancy (Virginia Tech, USA)

#### **Progressive Equalizer Matrix Calculation using QR Decomposition in MIMO-OFDM Systems**

Peng Xue, Kitaek Bae, Kyeongyeon Kim, Ho Yang (Samsung Advanced Institute of Technology, Korea)

Monday, January 14, 2013 • 10:00 – 12:00  
Room: Reno I

### **Mobile Device & Application I**

**Chair:** **Ben Falchuk** (Applied Communication Sciences, USA)

#### **A New Posture Monitoring System for Preventing Physical Illness of Smartphone Users**

Hosub Lee, Sunjae Lee, Youngsang Choi, Youngwan Seo, Eunsoo Shim (Samsung, Korea)

#### **An Energy-Efficient Network Implemented With Junos SDK**

Hongsen Yu (Columbia University, USA)  
Vindya Wijeratne (Queen Mary, University of London, UK)  
Zhihong Cai (Juniper Networks, CNRD, China)

#### **Analyzing the Coverage of the Single Frequency Broadcast Network for Handheld Receivers**

Muhammad Moiz Anis (Telecom Bretagne, France)  
Xavier Lagrange (Institut Mines Telecom / Telecom Bretagne, France)  
Ramesh Mahendra Pyndiah (Institut Telecom/Telecom Bretagne, France)

#### **Energy Efficiency Analysis in Device-to-Device Communication Underlying Cellular Networks**

Xianyan Qiu, Liao Xuwen, Ke Dong, Shihua Zhu (Xi'an Jiaotong University, China)

#### **Fluid User Models for Personalized Mobile Apps: Overview of the BrightNotes System**

Shoshana Loeb (2M Companies, USA)

#### **Host-based Distributed Mobility Management: Example of Traffic Offloading**

Jong-Hyouk Lee (Telecom Bretagne, France)  
Jean-Marie Bonnin, Xavier Lagrange (Institut Mines Telecom / Telecom Bretagne, France)

# MONDAY PROGRAM

## WORK-IN-PROGRESS SESSIONS

Monday, January 14, 2013 • 10:00 – 12:00

Room: Reno II

### Applications

**Chair: Wei Hao** (Northern Kentucky University, USA)

#### A Fuzzy Based Credibility Evaluation of Recommended Trust in Pervasive Computing Environment

Naima Iltaf, Abdul Ghafoor  
(National University of Sciences and Technology, Pakistan)

#### Accelerating E-Commerce Sites in the Cloud

Wei Hao, James Walden, Chris Trenkamp  
(Northern Kentucky University, USA)

#### CCN Networking Architecture for Mobile Applications

Seongik Hong, Myeong-Wuk Jang, Byoung-Joon BJ Lee  
(Samsung Advanced Institute of Technology, Korea)

#### Focused Crawling for Building Web Comment Corpora

Melanie Neunerdt, Bianka Trevisan, Markus Niermann,  
Rudolf Mathar (RWTH Aachen University, Germany)

#### Improved Feature Representation for Robust Facial Action Unit Detection

Sudha Velusamy, Viswanath Gopalakrishnan,  
Balasubramanian Anand, Pratibha Moogi, Basant Pandey  
(Samsung Indis Software Ops Pvt Ltd, India)

#### Photo-Realistic 3D Reconstruction of Large-Scale and Arbitrary-Shaped Indoor Environments

Egor Bondarev, Peter H.N. de With, Francisco Heredia,  
Raphael J.J. Favier, Lingni Ma  
(Eindhoven University of Technology, Netherlands)

Monday, January 14, 2013 • 13:00 – 15:00

Room: Laughlin I

### Wireless Communication II

**Chair: Yang Lu** (DOCOMO, China)

#### A New PUCCH Resource Mapping Method in Inter-band TDD Carrier Aggregation Systems

Yang Lu, Qin Mu, Liu Liu, Mingju Li, Lan Chen  
(DOCOMO Beijing Communication Laboratories Co., Ltd, China)  
Kazuaki Takeda (NTT DOCOMO, Inc., Japan)

#### An Easy-to-Implement Dual Codebook Design for Multiuser MIMO Systems

Yue Ma, Lihua Li, Jin Jin, Yucang Yang  
(Beijing University of Posts and Telecommunications, China)

#### Channel State Dependent Adaptive Spatial Spectrum Sensing Algorithm for Cognitive Radios

Muhammad Iqbal, Abdul Ghafoor  
(National University of Sciences and Technology, Pakistan)  
Sajjad Hussain (MAJU, Pakistan)  
Rizwan Ghaffar (University of Waterloo, Canada)

#### Cooperative MAC Protocol with Distributed Relay Selection and Physical Rate Adaptation

Slimani Hicham (INP/ENSEEIH-IRIT, University of Toulouse, France)  
Benoit Escrig (Université de Toulouse, France)  
Riadh Dhaou (IRIT/ENSEEIH, University of Toulouse, France)  
André-Luc Beylot (IRIT Toulouse, France)

#### PHY Front End Design for Emerging 60 GHz Multi-Gigabit Wireless Devices

Lochan Verma, Mohammad Fakharzadeh  
(Peraso Technologies Inc., Canada)

Monday, January 14, 2013 • 13:00 – 15:00

Room: Reno I

### Mobile Device & Application II

**Chair: Hosub Lee** (Samsung, USA)

#### Local Selected IP Traffic Offload Reducing Traffic Congestion within the Mobile Core Network

John Cartmell, Bartosz Balazinski, John McNally  
(InterDigital Communications Corp, USA)

#### Localization of An Acoustic Source Using Smart Phones

Yue Wang, Liyang Rui, Wenjia Shi, Dominic K. C. Ho, Yi Shang  
(University of Missouri, USA)

#### PIOS: A Platform-Independent Offloading System for a Mobile Web Environment

Sehoon Park, Qichen Chen, Heon Y. Yeom  
(Seoul National University, Korea)

#### Shim6 Assisted Mobility Scheme

Muhammad Mudassir Feroz, Adan Kiani  
(National University of Science and Technology, Pakistan)

#### Wake IQ: Using a Smartphone to Reduce Sleep Inertia

Michael Van Devender, Yi Shang (University of Missouri, USA)

Monday, January 14, 2013 • 13:00 – 15:30

Room: Reno II

### Multimedia Networking

**Chair: Wenjun Zeng** (University of Missouri, USA)

#### Delivery System and Receiver for Service-compatible 3DTV Broadcasting

GwangSoon Lee (ETRI, Korea)

#### FARCREST: Euclidean Steiner Tree-based Cloud Service Latency Prediction System

Boon Ping Lim, Poh Kit Chong, Ettikan Kandasamy Karuppiah,  
Yaszrina Mohamad Yassin (Mimos Bhd, Malaysia)  
Amril Nazir (University College London, UK)  
Mohamed Farid Noor Batcha (Mimos Bhd, Malaysia)

#### Mainstream Media vs. Social Media for Trending Topic Prediction - An Experimental Study

Aleksandre Lobzhanidze, Wenjun Zeng, Paige Gentry,  
Angelique Taylor (University of Missouri, USA)

#### Method For Fast Bits Estimation In Rate Distortion For Intra Coding Units In HEVC

Sumit Johar, Manoj Alwani (STMicroelectronics, India)

#### MPEG Video Streaming Solution for Multihomed-Terminals in Heterogeneous Wireless Networks

Allen Ramaboli, Olabisi Emmanuel Falowo  
(University of Cape Town, South Africa)  
H Anthony Chan (Huawei Technologies, USA)

#### Multi-Stream Viewer: Simultaneous Viewing System for Streaming Videos with the Time Tag

Kazuki Nakamura, Ryo Tanigawa, Hideki Shimada, Kenya Sato  
(Doshisha University, Japan)

#### TCP Differentiation using Version Identification and EDCA for Low-Delay Multimedia Streaming

Kazuhide Sonoda, Kazumine Ogura, Jiro Katto  
(Waseda University, Japan)



# MONDAY PROGRAM

## WORK-IN-PROGRESS SESSIONS

Monday, January 14, 2013 • 15:30 – 17:30  
Room: Laughlin III

### Wireless Communication III

**Chair: Venkatesha Prasad**

(Delft University of Technology, Netherlands)

#### Analysing IEEE 802.15.3c Protocol in Fi-Wi Hybrid Networks

Venkatesha Prasad, Bien Quang, Kishor Chandra  
(TU Delft, Netherlands)

Xueli An (Bell Labs, Alcatel-Lucent, Belgium)

Huong Nguyen (Hanoi University of Technology, Vietnam)

#### Enhanced Leakage-Based Precoding Schemes for Multiuser MIMO Downlink

Jin Jin, Lihua Li, Yue Ma

(Beijing University of Posts and Telecommunications, China)

#### Load Balancing Performance of Dynamic SCell Measurement Period Relaxing in LTE-A

Xiaoyu Duan

(Beijing University of Posts and Telecommunications, China)

#### Precoding Optimization for Interference Cancellation in Multiuser Relay Networks for LTE-Advanced

Saransh Malik (Chonnam National University, Korea)

#### Smart Switch: Optimize for Green Cellular Networks

Qilin Fan, Xiaohu Chen, Hao Yin (Tsinghua University, China)

Ran Liu (Huazhong University of Science and Technology, China)

#### Study of Clear Channel Assessment Mechanism for ZigBee Packet Transmission under Wi-Fi Interference

Yong Tang, Zhipeng Wang, Tianyu Du, Dimitrios Makrakis,

Hussein Mouftah (University of Ottawa, Canada)

Monday, January 14, 2013 • 15:30 – 17:30  
Room: Reno I

### Sensor Networks

**Chair: Sang Joon Kim** (Samsung, Korea)

#### An Event-Driven Clustering-Based Technique for Data Monitoring in Wireless Sensor Networks

Attapol Adulyasas, Zhili Sun, Ning Wang (University of Surrey, UK)

#### An Implementation Study of Relay Selection Schemes for Energy Harvesting WSNs

T V Prabhakar (IISc, India)

R Venkatesha Prasad (TU Delft, Netherlands)

Akshay Uttama Nambi, Madhuri Iyer

(Indian Institute of Science, India)

Ignas G.M.M. Niemegeers (TU Delft, Netherlands)

Jamadagni (Indian Institute of Science, India)

#### Energy Relaying in Mobile Wireless Sensor Networks

Seung Keun Yoon, Sang Joon Kim, Uikun Kwon

(Samsung Electronics, Korea)

#### Improving Energy Efficiency of Data Communication in a Hybrid PKI-based Approach for WSNs

Omar Alfandi, Arne Bochém, Ansgar Kellner, Dieter Hogrefe

(University of Goettingen, Germany)

#### Performance Analysis of a Handover Mechanism for a Mobile Wireless Sensor Network

Qian Dong, Waltenegus Dargie

(Technische Universität Dresden, Germany)

#### Using SOMs and CoAP-RELOAD to Enable Autonomous Wide Area Sensor Networks

Jouni Mäenpää (Ericsson, Finland)

# KEYNOTE SPEAKERS



**Saturday, January 12, 2013**  
**Opening & Keynote Address**  
**08:30 – 09:00 • Room: Vista Room**

**Donald L. Schilling**  
Chairman, LINEX Technologies

## *Vision of Wireless Consumer Communications*

The wireless communication needs of the Consumer has produced a Wireless Communications Revolution, which does far more than provide a means of talking or of text messaging. We are today setting the stage for Wireless Cities.

The Wireless City is one in which people use One Phone, a hand-held computer, which permits you to talk, receive your email, download a book, watch a movie or TV, or listen to music, in real time. This device comes equipped with an expandable screen and provides 3D imaging, without glasses. Further, for your safety and convenience, a built-in GPS system enables others to locate you or allow you to plan your route. Other applications include shopping using an application containing a computerized replica of the user, sometimes called an avatar, that models the user's proposed clothing purchase to the person's actual body shape, from any store in an electronic shopping mall. In addition, home security cameras connect to the One Phone if there is a "break in," to show real time images of what is occurring and notify law enforcement.

The Wireless City also includes automobiles equipped with a wireless vehicular collision avoidance system, and an "automatic pilot," so that you can perform other tasks while the vehicle carries you to your intended destination. It also includes the "wireless post office," which can operate efficiently - and at a profit!

The key, to make this happen is, Multiple Access technology using MIMO, to permit multiple signals from multiple users to share a limited bandwidth.

This talk features some of the technical issues surrounding the above ideas, which includes the use of small cells, such as mesh networks and femto-cells, and the evolving Standards, and Patents.

These topics show the major role played, and that will be played, by ComSoc, as we proceed with this Wireless Revolution.

**Biography:** Dr. Schilling received his undergraduate degree in Electrical Engineering from the City College of New York in 1956, his M.S.E.E. from Columbia University in 1958, and his doctorate from the Polytechnic Institute of Brooklyn in 1962. He was a Professor of Electrical Engineering at both the Polytechnic Institute of Brooklyn, and the City College of New York, where he held the Position of Herbert Kayser Distinguished Professor. He retired from CCNY in 1992.

Professor Schilling has held a variety of private-sector positions to develop commercial applications of spread-spectrum technology, including CEO of InterDigital Communications Corporation (1992-1994). He is currently Chairman of LINEX Technologies.

From 1996-98, Dr Schilling headed the TIA 46.1 Standards Committee, WIMS, which joined with ETSI and ARIB to form the 3GPP Wideband CDMA Standard. Dr. Schilling has authored or co-authored twelve textbooks, over 200 technical papers, and holds more than 120 patents. He has been very active in the IEEE and the IEEE Communications Society. He helped start the IEEE Communications Society Magazine, the IEEE Journal on Selected Areas in Communications (JSAC), MILCOM, and INFOCOM. He served as Editor of the Transactions on Communications and Director of Publications from 1968-1978. He was President of the IEEE Communications Society from 1980-1981 and was a member of the IEEE Board of Directors from 1982-1983. Among his honors, he is a Life Fellow of the IEEE and has received the Donald W. McLellan Meritorious Service Award in 1978, the Edwin Howard Armstrong Achievement Award in 1998, MILCOM's Technical Achievement Award in 2000, and has served as a member of the US Army Science Advisory Board.

# KEYNOTE SPEAKERS



**Saturday, January 12, 2013**  
**Keynote Address**  
**18:00 – 19:00 • Room: Vista Room**

**Kilsu Eo**  
Executive Vice President, Samsung  
Convergence Solution Team, Software R&D Center  
User Experience Center, DMC R&D Center

## *Smart Life with Convergence*

Over several years, Samsung Electronics has been leading the CE/IT device market with various devices. These have been achieved by the wide spectrum of products including smart phone and smart TV as well as the technical leadership.

Nowadays, because the concept of product has been changed from the single device itself to the window for giving user experience, if the device can't give the integrated user experience to users, it can't be a market leading product. Therefore, in order to lead the market, device manufactures must find the way to give more differentiated experience to users rather than any other companies. One of the solutions is the convergence - how previously separate networks, devices, and services can converge to offer new, exciting services.

This keynote will broadly explore the IT mega trends around CE/IT device manufactures for the convergence - Cloud/Big Data/Device Convergence - and why these trends are important to device manufactures. Throughout the keynote, the audience will be able to obtain the insight to the CE market, which technologies should be developed in each trend for the device manufacturers as to give an integrated experience to users - Smart Life.

**Biography:** Dr. Eo received his Bachelor's degree in Electronics Engineering from the Seoul National University in 1982, Master's degree in 1984 and Ph.D. degree in 1989 in Electrical Engineering from KAIST. His Ph.D. major was computer graphics including ray tracing, hardware acceleration engine for rasterization based on parallel processing, and object modeling.

He joined Samsung Electronics in 1989. Since then, he has developed various technologies and solutions for virtual reality, audio/video codec, DTV middleware, application, etc. He was given the Industry Prize from the Ministry of Knowledge Economy in Korean Government for his contribution to the embedded software industry in 2010.

Now, he is Executive Vice President of Samsung Electronics and vice chairman of Korea Embedded Software Industry Council. In Samsung Electronics, he is leading Convergence Solution Team in Samsung Software R&D Center, which focuses on the research and development of the convergence solutions such as Allshare™, cloud, big data, smart home and security. And also he is leading User Experience Center in Samsung DMC R&D Center, where they are discovering user values and scenarios for new services and designing the identity of Samsung products and services. He is looking for the opportunities of combining the products with services, so he is interested in the areas such as cloud server/services, data analytics, web-centric solution, convergence platform and ecosystem. He expects that all these technologies will be applied to our daily lives not only with CE devices but also with future cars and health care devices.



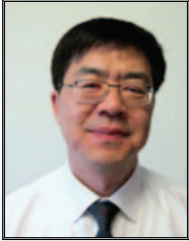
**Sunday, January 13, 2013**  
**08:30 – 09:30 • Room: Vista Room**

**Albert Greenberg**  
Partner Development Manager  
Microsoft

## ***SDN in Windows Azure Cloud***

Software Defined Networking (SDN) is a much hyped term without clear definition or agreement on scope or meaning. In this talk, we present the "real world" problems in networks in a large cloud like Windows Azure. We then describe how software is being used in Windows Azure to solve these problems. By software control of the physical network hardware, one can achieve reliability and scale of operations for a large public cloud. We describe an approach to software control of the physical network. In addition, by delivering virtualized networks and network functions like load balancing realized and managed in software, one can achieve the needs for multi-tenancy and virtualization in the cloud.

**Biography:** Albert Greenberg is the Partner Development Manager at Microsoft, where he leads design and development of cloud networking services and technologies at Windows Azure, for both logical and physical data center networking. Albert joined Microsoft Research in 2007, where he worked on data center networks, cloud service infrastructure, enterprise network management, and monitoring. Albert joined Microsoft after many years at Bell Labs and AT&T Labs Research, where he was an Executive Director and AT&T Fellow, and where he helped build the systems and tools for engineering and managing AT&T's networks. Albert is an ACM Fellow.



**Sunday, January 13, 2013**  
**Banquet & Keynote Address**  
**19:00 – 21:00 • Room: Vista Room**

**I.P. Park**  
Executive Vice President & CTO  
HARMAN International

## *Game Changers of Future Consumer Communications*

Many of us can still remember the era of mainframe computers, and how they quietly succumbed to compact desktop devices that exponentially multiplied processing power and users. Today, we are in the middle of a far more dramatic shift of the IT & Communications technology (ICT) paradigm thanks to mobile devices, apps and the cloud.

HARMAN is a manufacturer of a wide range of audio and infotainment products for the automotive, consumer and professional markets. With the current transformation of the ICT paradigm, technology companies like HARMAN are faced with new challenges and greater opportunities.

In this talk, I will discuss some key takeaways from this newly emerging platform of mobile universe. They can be summarized into three defining categories – big data, smart connectivity and “future” user experience, which are poised to be major game changers of our industry.

**Biography:** As CTO, Dr. I.P. Park leads the company-wide technology strategy and is responsible for overseeing all R&D activities, which are mostly in the areas of automotive infotainment, consumer and professional audio systems. As a member of HARMAN's Executive Committee, he leads advanced research projects to bring innovative thought leadership into HARMAN products. I.P. joined HARMAN in February, 2012.

Prior to HARMAN, I.P. was Vice President of Intelligent Computing Laboratory (previously under different names such as Computer Science Lab, Software Lab) at Samsung Electronics from 2006 to 2011. He headed advanced software R&D teams to develop Samsung's future software technologies, provided leadership in core software research, standardization and open source strategy. He founded STAR Center, a joint research lab with Georgia Tech. and CIC (Center for Intelligent Computing) with Seoul National University.

Prior to Samsung, I.P. was Department Head of Security and Platform Technologies at Panasonic Princeton Laboratory. He led projects in areas of operating system platforms, embedded Linux systems, and secure download for software-defined radio. He was instrumental in establishing the Consumer Electronics Linux Forum (CELF) and served as founding chair of the Architecture Group. Under his leadership, the CELF 1.0 standard specification and CELF 1.0 source tree was published, establishing CELF as a global leader for Linux CE adaptation and enhancements.

I.P. has also held senior roles at Timecruiser Computing Corporation, an Internet software company specializing in building Java-based enterprise systems, and was a faculty member at New York Institute of Technology (NYIT). He has also been a visiting researcher at Bellcore.

Dr. Park received a B.S. in Computer Science from Seoul National University, and a M.S. and Ph.D. in Computer Science from Columbia University.



**Saturday, January 12, 2013**  
**12:30 – 13:30 • 15:30 – 16:00**  
**19:00 – 20:00**

**Room:**  
**Scenic Room**

**Sunday, January 13, 2013**  
**13:00 – 14:00 • 15:30 – 16:30**

## **WeatherPlay**

**Authors:** Arlene Ducao, Yuzhao Ni, Henry Holtzman, Robert Hemsley (MIT, USA)

In this paper, we examine the implementation and usage scenarios for WeatherPlay, a web site that collects weather and travel TV clips, microblog entries, amateur videos, and outdoor data. In order to present a comprehensive picture of people's outdoor experiences, WeatherPlay geo-locates this media and places it in both a map and video gallery context.

## **LLCPS: A New Security Framework Based on TLS For NFC P2P Applications in the Internet of Things**

**Authors:** Pascal Urien (Télécom ParisTech, France)

The NFC (Near Field Communication) is a promising emerging technology for the Internet of Things (IoT). It enables short range communications (a few centimeters) with modest throughputs (a few hundred Kbit/s) and low power consumption (a few mW). Although this technology is deployed for payment, access control, or data transfer applications, it is not today secure. This demonstration presents the first implementation of the TLS protocol for NFC P2P mode, according to a new framework, named LLCPS described by an IETF draft. LLCPS should enable a wide range of secure services for the IoT.

## **Prototype for Design-time Secure and Trustworthy Service Composition**

**Authors:** Bo Zhou, David Llewellyn-Jones, Qi Shi, Muhammad Asim, Madjid Merabti (Liverpool John Moores University, UK)

Service-oriented environments provide the opportunity for services from different providers to work together, forming new composite services via composition of existing services. However, in addition to the intended outcomes, composition also introduces the potential for unexpected or emergent behaviour, resulting in new uncertainties, especially in the area of security. Funded by the European FP7 programme, our research focusses on providing a service composition platform that is secure and trustworthy. We will demonstrate the design-time prototype that show how to create service compositions, verify them against security policies and make sensible recommendations based on a user's security preferences.

## **EVANS3: Home Appliance Control System with Appliance Authentication Framework Using Augmented Reality Technology**

**Authors:** Shinya Mihara, Kohei Kawai, Hideki Shimada, Kenya Sato (Doshisha University, Japan)

The popularity of network home appliances increases. However, operation of such devices are complex, and are difficult for users to identify the network home appliances they want to operate, since the appliances' placed locations are not represented within the operating system. For these problems, obvious and intuitive operations are needed, and thus we have presented EVANS2 (Embodied Visualization with Augmented Reality for Networked System 2) in our past proposal, which implements augmented reality technology. We have also implemented our proposed LED Marker as the AR marker to identify

the network home appliance's location in any altering light environments. We propose an EVANS3 system, which is an LED Marker installed framework of the EVANS2. By dynamically operating the LED Marker, we achieve a comfortable and effective appliance authentication environment for a suitable user's operating conditions, and allow us to actually control the real home appliance through the AR interface.

## **Prototypes of Opportunistic Wireless Sensor Networks Supporting Indoor Air Quality Monitoring**

**Authors:** Petros Spachos, Liang Song, Dimitrios Hatzinakos (University of Toronto, Canada)

In this demonstration proposal, we describe a prototype of a Wireless Sensor Network (WSN) for monitoring the air quality of an arbitrary indoor infrastructure environment. Specifically, the proposed demonstration deals with an application of wireless mesh networks for monitoring the carbon dioxide levels of an indoor environment, supporting guaranteed real-time data acquisition and display. In the proposed demonstration we will illustrate a number of advantages of opportunistic routing, including dynamic node deployment and dynamic routing path selection, opportunistic resource utilization, robustness to interference and guaranteed multi-hop QoS (Quality of Service) for an indoor gas concentration monitoring network.

## **TrafficCam: Sharing Traffic Information based on Dynamic IPv6 Multicast Group Assignment using Smartphone Sensors**

**Authors:** Yohei Kanemaru, Satoru Noguchi, Atsuo Inomata, Kazutoshi Fujikawa (Nara Institute of Science and Technology, Japan)

Exchanging traffic information among nearby vehicles is one of communication scenarios in the field of intelligent transport systems (ITS). An important question in this scenario is "How to deliver traffic information only to a subsets of nearby vehicles in an identical road traffic event?", e.g., traffic congestion in a certain lane. In this paper, we propose a dynamic IPv6 multicast group assignment mechanism using GPS, accelerometer and magnetometer embedded in smartphones. Our mechanism enables each node to determine a relevant vehicle, and to compose a temporary IPv6 multicast address. Our mechanism can deliver traffic information to a group of vehicles sharing a particular situation. This demonstration shows a pseudo-traffic congestion detection scenario using a prototype of the proposed mechanism, implemented as an Android application called TrafficCam. Our application demonstrates the validity of the proposed mechanism.

## **GEMS: SMS-based App Store for Growth Economies**

**Authors:** Daniel Risi, Mauro Ricardo da S Teófilo, Thomaz Silva (Nokia Institute of Technology, Brazil)

Mobile applications have become one of the main pillars in the current mobile industry ecosystems. But regardless of their unquestionable popularity in the smartphone domain, a great challenge is still to be faced in the feature phone arena: data connection is far from ubiquitous among that segment. Besides the prohibitive cost of mobile Internet plans for many users, especially in developing

**Saturday, January 12, 2013**  
**12:30 – 13:30 • 15:30 – 16:00**  
**19:00 – 20:00**

**Room:**  
**Scenic Room**

**Sunday, January 13, 2013**  
**13:00 – 14:00 • 15:30 – 16:30**

countries, a large portion of the bottom-tier phones simply does not offer that feature yet. GEMS is an end-to-end solution that addresses this issue by enabling short messages - a quasi-omnipresent service in all user segments and markets - to act as that transport. By offering a client environment that mounts applications based on a set of predefined UI components, it can make relatively complex applications fit into a small number of concatenated SMS, thus making a strong and practical app store statement for the long tail.

## **Application Defined Computing in Smartphones and Consumer Electronics**

**Authors:** Arun Jagatheesan, Zheng Li (Samsung R&D Center, USA)

Smartphones to enterprise servers, computing systems are built with generic and commodity components, such as flash (NAND) storage, memory, etc. Although such generalization of commodity components reduces the cost of the product, generic components result in severe inefficiency in terms of energy and performance. We introduce Application Defined Computing (ADC) to specialize generic hardware based on runtime application characteristics. Our demonstration prototype and experimental results show that brokering just a couple of parameters in DRAM (memory) systems could improve Energy Delay Product by 23% and performance by 17% for smartphones. Our approach could be used in most consumer electronics products with diverse application workloads.

## **FARCREST: Euclidean Steiner Tree-based Cloud Service Latency Prediction System**

**Authors:** Boon Ping Lim, Poh Kit Chong, Ettikan Kandasamy Karupiah, Yaszrina Mohamad Yassin (Mimos Bhd, Malaysia)  
 Amril Nazir (University College London, UK)  
 Mohamed Farid Noor Batcha (Mimos Bhd, Malaysia)

Cloud resource provisioning is crucial to assure timely deliverable of delay-sensitive cloud services. Today, virtual machine reservations are done mainly based on cloud resource availability. Often, maximum VM resources are preserved to assure service response time, resulting in a waste of resources. Existing state-of-the-arts measure cloud response time by deploying target applications on cloud infrastructure. Such methods incur high overhead and useless for real-time performance measurement for delay-sensitive application. In this demo, we present a light-weight realtime service latency prediction mechanism based on Euclidean Steiner Tree model for optimum VM resource allocation in delay-sensitive cloud services. Our aim is to derive a highly accurate service latency prediction mechanism reflecting timely information of the actual cloud resources conditions, while imposing minimum overheads to the cloud service. We present a fast response cloud resource estimation system - FARCREST which integrates the prediction model with cloud front-end server for VM services latency prediction.

## **SDNAN: Software-Defined Networking in Ad Hoc Networks of Smartphones**

**Authors:** Paul Baskett, Yi Shang, Wenjun Zeng (University of Missouri, USA)  
 Brandon Guttersohn (Southeast Missouri State University, USA)

In this paper, SDNAN, a first attempt to implement software-defined

networking (SDN) over a wireless ad hoc network of smartphones, is presented. Its modular ad hoc network management structure can be easily modified and extended. Its abstractions and interfaces allow components to communicate without knowing how other components work. Third-party applications can use the interfaces to access the ad hoc network, significantly reducing development time and program complexity. A prototype system has been implemented on Android smartphones over Wi-Fi and achieved good preliminary results.

## **Performance Improvement of Mobile P2P VoD by Opportunity Extension**

**Authors:** Hyun Lee, Jae-Yong Yoo, JongWon Kim (Gwangju Institute of Science & Technology, Korea)

This demonstration introduces our on-going work called MOVi+ that attempts to improve the video delivery performance of MOVi (Mobile Opportunistic Video-on-demand) by scheduling segments from the whole node perspective. By deploying segment based caching-enabled switch, MOVi+ increases the opportunity which reflects the pairing chances among nodes. MOVi+ also evaluates the merit of pre-diffusion-aware scheduling to utilize the time varying opportunity as much as possible. We shows that MOVi+ can eventually service more number of mobile nodes than MOVi with lower segment missing ratio, better opportunity usage, and playout continuity.

## **FINS: Model-Based Design of Flying Indoor**

**Authors:** Anwar Al-Khateeb (Politecnico Di Torino, Italy)  
 Eric Baczuk (MIT, Netherlands)  
 Carlo Ratti (Massachusetts Institute of Technology, USA)

In this report, we introduce simple and efficient indoor navigation prototype used for flying object. FINS model was built using Simulink and USRP hardware. It includes accurate indoor GPS system and flying system design. It is based on Pseudolite idea to solve the problem of indoor location with high noise and multipath. It helps the designer to make small helicopters as digital pixels of moving picture in indoor environment which not easy to control, process and communicate between them. The system can also use for many indoor applications like for example tracking person or things in hospital with high accuracy.

## **Enabling New E-health Business Models by Converging IP-based and Non-IP-based Home Networks**

**Authors:** Frank den Hartog, Martin Tijmes, Eelco Cramer (TNO, Netherlands)  
 Arjen Noorbergen (Home Automation Europe, Netherlands)

Current efforts in extending the Internet are focused on achieving full support of services and user-centric content from sectors such as energy management, education, and e-health. Until recently, these sectors typically developed their own communication infrastructure and systems, leading to point solutions, often built on non-IP technologies. We describe a demonstration that shows how a non-IP supporting Continua health device, such as a weighing scale, can be unlocked for use by other devices and services in the home by applying Universal Plug and Play (UPnP), and how this enables new use cases and business models.

**Saturday, January 12, 2013**  
**12:30 – 13:30 • 15:30 – 16:00**  
**19:00 – 20:00**

**Room:**  
**Scenic Room**

**Sunday, January 13, 2013**  
**13:00 – 14:00 • 15:30 – 16:30**

## **Improving Associations in IEEE 802.11 WLANs**

**Authors:** Mónica Alejandra Lora, Alexander Paulus, Klaus Wehrle (RWTH Aachen University, Germany)

In this demo, we will present Gossipmule, a decentralized approach to improve WiFi association performance of stations in IEEE 802.11 WLANs. Our approach empowers stations to exchange information regarding the access points's capabilities and performance with other stations, in order to improve association decisions and speed up handoff sessions.

## **Scaling Smart Spaces: Concept and Exploration**

**Authors:** Hock Beng Lim, Ken Ong, Jithendrian Sundaravaradan

(Nanyang Technological University, Singapore)

**Fei Xue, Kai Liu, Wenqiang Wang**

(Nanyang Technological University, Singapore)

The ability to link two physical smart spaces in real-time, and apply the knowledge acquired from designing and managing the small densely instrumented space to the larger and less densely monitored space opens up a whole host of possibilities in terms of how architects and engineers approach building design, building environment modeling, energy resource optimization, and building control. We leverage and extend the EcoSense framework to link smart spaces. This provides the ability to 'scale' environmental profiles derived from optimized simulation models and verified in a small physical building testbed to a much larger building space with relatively fewer sensors. We have implemented a prototype linkage framework connecting two real physical building testbeds to validate this concept.

## **A Peer-to-Peer Microblogging Service Based on IP Multicast and Social Virtual Private Networking**

**Authors:** Pierre T. St. Juste, Renato Figueiredo

(University of Florida, USA)

Microblogging services such as Twitter or Identica have become an indispensable communication tool on the Internet. Dubbed social media by some, these services allow people to share ideas, news, and even coordinate social and political revolutions. However, due to their centralized nature, microblogging services have been susceptible to blocking by governments and powerful groups. To address this issue, we present a peer-to-peer microblogging service that is resistant to government intrusions and censorship. The strength of our design lies in the fact that we leverage trusted, peer-to-peer connections for the dissemination of information. Our proposed design consists mainly of two key components: a microblogging service which uses UDP and IP multicasting to push and pull updates, and a peer-to-peer VPN (SocialVPN) which enable IP multicasting over the Internet and provide direct IP connectivity among social peers. We also implemented and deployed a prototype to show the feasibility of our approach.

## **Towards A System for Body-Area Sensing and Detection of Alcohol Craving and Mood Dysregulation**

**Authors:** Paul Baskett, Yi Shang (University of Missouri, USA)

**Michael Patterson** (Gustavus Adolphus College, USA)

**Timothy Trull** (University of Missouri, USA)

Current methods in clinical psychology primarily rely on questionnaires and interviews with examiners. This paper presents preliminary work towards a smartphone-based wireless body area sensing system that will be used to improve current methods and provide real-time interventions if necessary. This system consists of several wearable sensors for measuring physiological data, a smartphone, and a web server. The smartphone is the centerpiece, responsible for collecting sensor data, interacting with the user, performing real-time computation, and communicating with the web server. The system collects physiological data, self-reported emotional and behavioral state, and other user-context data such as GPS location or ambient audio recording.

## **CoCam: Real-time Photo Sharing Based on Opportunistic P2P Networking**

**Authors:** Eyal Toledano, Dan Sawada, Andrew Lippman, Henry Holtzman, Federico Casalegno (MIT, USA)

We describe a mobile application for sharing user authored photo content in real-time called CoCam. CoCam is a collaborative content sharing framework based on opportunistic P2P proximal networking. CoCam users who are located in the same physical space can automatically share the photos they create as well as receive photos from other users around them. Since CoCam is based on an opportunistic P2P network middleware, users are not required to know each other in advance. It is also not necessary for them to agree on the same service provider nor coordinate the network configuration, infrastructure and security settings. This middleware automatically discovers other peers and handles the organization of ad-hoc network connections. With CoCam, we demonstrate that users are able to share and enjoy shared photos and video streams without the effort of manual setup and cost associated with the 3G/4G network.

## **Mobility - Rethinking Productivity in the Enterprise**

**Author:** Long Nguyen (Composite Apps, USA)

Mobility is revolutionizing how we live, play and now, how we work. It opens up a whole world of possibilities and markets for companies and its employees. It enables new and innovative ways to work, nurture creativity, capture ideas and deliver to customers at any time, in any place. It can create entire markets and breaks down barriers like never before. Companies have been slow to embrace this new platform. Most attempts have resulted in miniature versions of the existing office desktop environment with some nice gestures and features, but they fall short of achieving the goals of true mobility. At Composite Apps, we believe that mobility goes beyond recreating the current office paradigm; that companies need to rethink solutions from the ground up to tailor their services for the truly mobile workforce.

# SOCIAL PROGRAM

## Friday, January 11, 2013

18:30 – 20:00 • Scenic Room

### **Opening Reception**



## Saturday, January 12, 2013

09:00 – 09:30 • Vista Foyer  
**Networking Coffee Break**



11:30 – 12:30 • Vista Room  
**Luncheon**

12:30 – 13:30 • Scenic Room  
**Demonstrations**

15:30 – 16:00 • Scenic Room  
**Networking Coffee Break**

19:00 – 20:00 • Scenic Room  
**Happy Hour Demonstrations**

## Sunday, January 13, 2013

09:30 – 10:00 • Vista Foyer  
**Networking Coffee Break**

12:00 – 13:00 • Vista Room  
**Luncheon**

13:00 – 14:00 • Scenic Room  
**Demonstrations**

15:30 – 16:30 • Scenic Room  
**Demonstrations**

16:00 – 16:30 • Scenic Room  
**Networking Coffee Break**

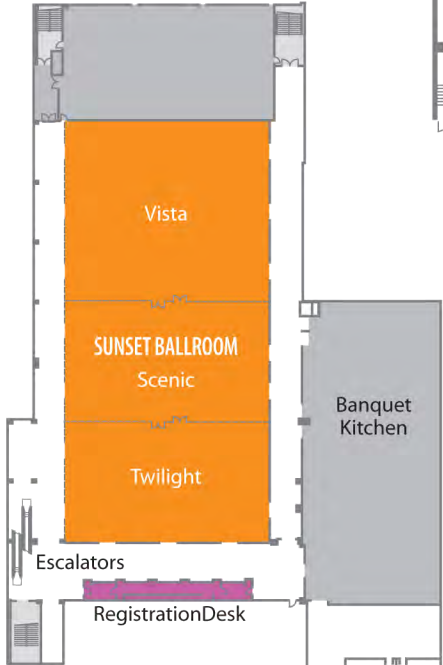
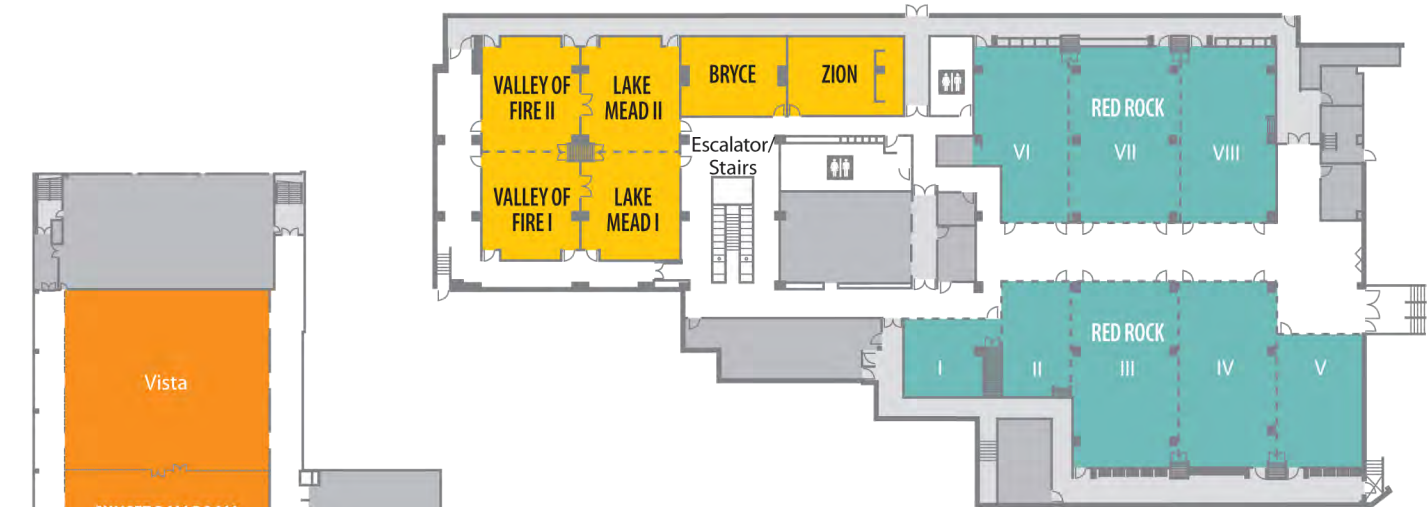
19:00 – 21:00 • Vista Room  
**Banquet and Keynote Address**



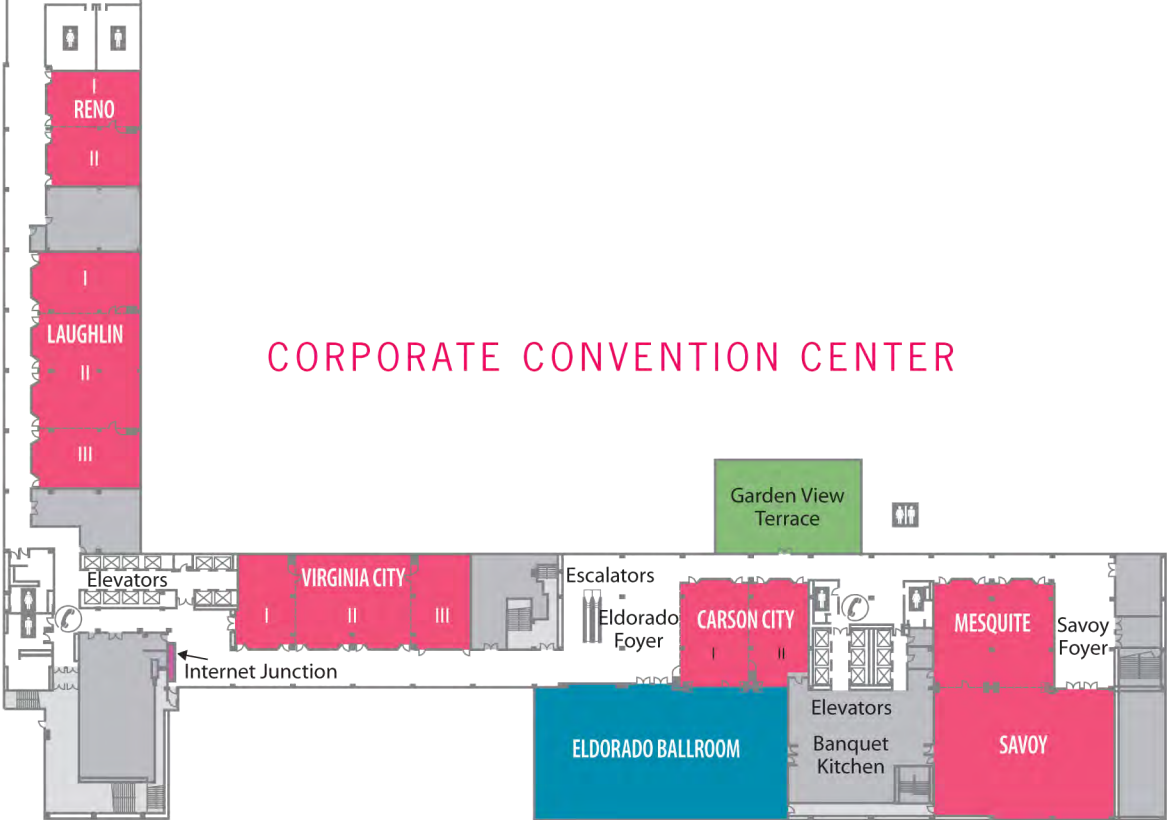


FLAMINGO LAS VEGAS  
Meeting Facilities Map

EXECUTIVE CONFERENCE CENTER



CORPORATE CONVENTION CENTER







At HARMAN, we believe that leadership is best demonstrated by example. As a global technology leader with a professional sound heritage, we are proud to support those endeavors that share in our commitment to improve life's experiences.



[www.harman.com](http://www.harman.com)

**AKG**

harman/kardon

Infinity

**JBL**

**lexicon**

mark  
levinson

# IEEE CCNC 2013 PATRONS

## Diamond



Samsung Electronics Co., Ltd. is a global leader in semiconductor, telecommunication, digital media and digital convergence technologies with 2010 consolidated sales of US\$138.1 billion. Employing approximately 174,000 people in 193 offices across 66 countries, the company consists of eight independently operated business units: Visual Display, Mobile Communications, Telecommunication Systems, Digital Appliances, IT Solutions, Digital Imaging, Semiconductor and LCD. Recognized as one of the fastest growing global brands, Samsung Electronics is a leading producer of digital TVs, memory chips, mobile phones and TFT-LCDs. For more information, please visit [www.samsung.com](http://www.samsung.com).



Headquartered in Stamford, Connecticut, HARMAN (NYSE: HAR) designs, manufactures and markets a wide range of audio and infotainment solutions for the automotive, consumer and professional markets – supported by 15 leading brands, including AKG, Harman Kardon, Infinity, JBL, Lexicon and Mark Levinson. The company is admired by audiophiles across multiple generations and supports leading professional entertainers and the venues where they perform. More than 25 million automobiles on the road today are equipped with HARMAN audio and infotainment systems. HARMAN has a workforce of about 13,400 people across the Americas, Europe and Asia, and reported sales of \$4.4 billion for the fiscal year ended June 30, 2012.



At Microsoft, we're motivated and inspired every day by how our customers use our software to find creative solutions to business problems, develop breakthrough ideas, and stay connected to what's most important to them.

We run our business in much the same way, and believe our eight business divisions offer the greatest potential to serve our customers.

We are committed long term to the mission of helping our customers realize their full potential. Just as we constantly update and improve our products, we want to continually evolve our company to be in the best position to accelerate new technologies as they emerge and to better serve our customers.

## Demonstrations



TNO is an independent research organisation. Its mission is to connect people and knowledge to create innovations that boost the sustainable competitive strength of industry and organisations, and the well-being of society as a whole. EtherTrust company (sponsor at IEEE CCNC 2013)



EtherTrust is a spin-off from Telecom ParisTech and the University of Paris VI. The company designs innovative and secure cloud architectures, whose trust is enforced by secure elements. EtherTrust platforms use the NFC technology in order to deploy innovative Internet of Things services for payment, access control and ticketing. The Aniketos platform helps maintain trustworthiness and secure behaviour of Future Internet services. It provides tools to developers, service providers and end users for developing, deploying and using services securely in dynamic environments. Aniketos is a collaborative project funded under the EU 7th Research Framework Programme (FP7/2007-2013), grant no 257930.

