*The 76th IEEE*
*Vehicular Technology Conference*

# Final Programme

# VTC2012-Fall

## QUÉBEC

*Towards Sustainable Mobility*

3 - 6 September 2012

**Québec City, Canada**

# Welcome from the General Co-chairs

It is a privilege and honor to welcome you to the Fall 2012 edition of VTC, an event that has become over the years a veritable institution in the wireless communication landscape.

VTC conferences are a tradition that, mirroring the wireless industry, have come a long way since the first edition, held in Detroit in 1950. As is the case for many of you, we have firsthand experience of the evolution of VTC over the last 14 years, going back to the 1998 edition held in Ottawa. That was the last year before the conference went semiannual and we had a remarkable attendance of 1111 delegates. The next year had both a Spring (Houston) and a Fall (Amsterdam) edition with VTC 1999 Fall also marking the 50th VTC edition milestone. That year also saw the birth of a tradition which consists in alternating (more or less) between global and North American locations.

This time, it is Québec City's turn to welcome VTC delegates from all parts of the world, and what a unique destination it is. Nestled atop dramatic cliffs overlooking a narrow passage of the Saint-Lawrence river, Quebec boasts a richness of history, architecture, culture and fine cuisine unparalleled in North America. It is our sincere hope that sampling Québec's culture, history, attractions, and great food will complement nicely the conference's technical content for all delegates. After all, the social side of such conferences, where lifelong friendships and collaborations are formed, should not be overlooked.

Finally, it is fitting to express here our deepest appreciation for the commitment and hard work of all who are involved in making this conference a success, including the VTS board, the organizing and technical program committees, and the sponsors. A special tip of the hat goes to the technical program committee chairs Fabrice Labeau, Jean-Yves Chouinard, and Alex Stéphenne.

We look forward to welcoming you in person in Québec and hope that you will thoroughly enjoy both the social and technical sides of the conference.

Sébastien Roy and André Morin
*IEEE VTC2012-Fall General Co-chairs*

# Welcome from the Technical Program Co-chairs

On behalf of the technical program committee, we warmly welcome all participants to the 76th IEEE Vehicular Technology Conference in beautiful Quebec City.

The committee has organized an impressive program on research trends and advances on mobile communication and vehicular technologies. The conference theme is "Towards Sustainable Mobility" and the conference is organized around 12 main technical tracks covering many exciting aspects related to the theme.

The technical program consists of 60 oral sessions and 8 poster sessions. The technical program committee have selected 297 oral papers and 194 poster papers from a total of 888 submissions. All accepted papers will be published in the conference proceedings. In addition to the regular sessions, the conference hosts2 workshops, 2 panel sessions and several tutorials addressing some of the most challenging and though-provoking aspects of wireless communications and vehicular technology.

The creation of this impressive program would not be possible without the constant support from an outstanding team of colleagues that we would like to thank warmly. Special thanks go to the conference track chairs that organized a very efficient and smooth reviewing process, as well as the workshops, panels and tutorial chairs that organized very exciting sessions.

We would also like to thank all the TPC members and reviewers for their professional and timely review of technical contributions. We are also very grateful to the outstanding support from Dr James Irvine in the technical program preparation process. Of course, making a successful technical conference would not have been possible without the participation from authors, to whom we would like to express our gratitude for having decided to present and share their ideas and contributions to our community.

We would also like to thank all members of the IEEE VTC2012-Fall organization committee for their support during all phases of the technical program development.

We look forward to meeting you in Quebec City, Canada, this September.

Jean-Yves Chouinard, Fabrice Labeau, Alex Stephenne
*IEEE VTC2012-Fall Technical Program Co-chairs*

# Welcome from the VTS President

On behalf of the IEEE Vehicular Technology Society, it is my pleasure to invite you to the IEEE 76th Vehicular Technology Conference in Québec City, Canada. This conference brings together researchers from all over the world to discuss and exchange ideas in the field of wireless, mobile, and vehicular technology. The gorgeous landscapes and natural, cultural, and historical attractions of Québec provide the setting for this exciting conference.

For over sixty years this flagship conference of the IEEE Vehicular Technology Society brings together individuals from academia, government, and industry to discuss and exchange ideas in the fields of wireless, mobile, and vehicular technology. Since 1999, VTC has been held twice a year: in North America, and rotating between Europe and the Asia-Pacific region, increasing accessibility to the conference experience throughout the world. We are currently taking steps to expand the coverage of vehicular electronics and land transportation to increase the breadth of VTC beyond its traditionally strong areas.

I wish to convey a special thank you to the General Chairs Sébastien Roy and André Morin, and Technical Program Chairs Jean-Yves Chouinard, Fabrice Labeau, and Alex Stéphanne. I'm sure that they will assemble what will be an exciting and stimulating program.

Finally, I wish to invite you to VTC 2012-Fall and hope to see you in Québec City.

Tracy L. Fulghum, *President*
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Roberto Prieto-Cerdeira
Basuki E. Priyanto
Pavel Prochazka
Ales Prokes
Jan Prokopec
Ioannis Psaromiligkos
Di Pu
Jeff Pugh
Matthias Pätzold
Amir Qayyum
Jian Qi
Chuyi QIan
Dajun Qian
Manli Qian
Wenxun Qiu
Dong Qiumin
Qiyhao
L. R. Vela-Garcia
Giuseppe Raffa
Gulzaib Rafiq
Siavash Rahimi
Payam Dehghani Rahimzadeh
Ashikur Rahman
Sridhar Rajagopal
Nandana Rajatheva
Valentin Rakovic
Chandrasekharan Raman
Ali Ramezani
José Ramón Gállego
Wang Ran
Amir Ranjbar
Asim Rasheed
Lars Rasmussen
Hamed Rasouli
Mehdi Rasti
Ronald Raulefs
Terhi Rautiainen
Danda B. Rawat
Saikat Ray
Saquib Razak
S. Mohammad Razavizadeh
Mark C. Reed
Ruggero Reggiannini
Andreas Reinhardt
Guillaume Remy
Haibao Ren
Younglin Ren
Eric Renault
Krisakorn Rerkrai
Resendez
Jihene Rezgui
Zouheir Rezki
Bilal Riaz
Carlos Ribeiro
Janne Riihijärvi
Taneli Riihonen
Stefano Rinauro
Sebastian Robitzsch
Marcel William Rocha da Silva
Sean Rocke
Antonio Rodrigues
Ignacio Rodriguez
Virgilio Rodriguez
Alberto Rodriguez-Mayol
Florian Roemer
Sebastian Rohde
Raphael Rolny
Michele Rondinone
Qian Rongrong
Stefano Rosati
Francesco Rossetto

Lorenzo Rubio Arjona
Luca Rugini
P. Ruuska
Heung-Gyoon Ryu
Sebastian Röglinger
Walid Saad
Harri Saarnisaari
Hamid Saber
Pouriya Sadeghi
Mehdi Sadeghzadeh
Tayeb Sadiki
Brian M. Sadler
Sanam Sadr
Amit Saha
Alphan Sahin
Kentaro Saito
Kei Sakaguchi
Abdellatif Salah
Kashif Saleem
Abdallah Bou Saleh
Mohammad Salehi
Anas Salhab
Jani Saloranta
Sana Salous
Petram Samadi
Doudou Samb
Sameer S. M
Ramon Sanchez
Juan Jesús Sánchez-Sánchez
Stephan Sand
Tzu-hsien Sang
Tachporn Sanguanpuak
Altair Santin
Samir Saoudi
Farshad Sarabchi
Pasi Sarolahti
Luciano Sarperi
Julien Sarrazin
Philippe Sartori
Sreela Sasi
Maheswaran Sathiamoorthy
Ata Sattarzadeh
Vladimir Savic
Krishna Sayana
Björn Scheuermann
Udo Schilcher
Laurent Schmalen
Anke Schmeink
Johannes Schmid
Ece G. Schmidt
K. Schmidt
Christoph Schmitz
Christian Schneider
Robert Schober
Elmar Schoch
Henrik Schumacher
Michael Schwall
Ramon S. Schwartz
Vincenzo Sciancalepore
Stefano Secci
Alaa Seddik-Ghaleb
Hiroyuki Seki
Damith Senaratne
Avik Sengupta
Sidi-Mohammed Senouci
Izzet Fatih Senturk
Miguel Sepulcre
Nikola Serafimovski
Jonathan Serugunda
Abu Sesay
Rohit Iyer Seshadri
Ubolthip Sethakaset
Stefano Severi
Younes Seyedi
Ehsan Seyedin
Oyunchimeg Shagdar
Ghalib A. Shah
Chintan P Shah
Zawar Shah
Iqbal Shahid
Chowdhury Shahriar
Abdallah Shami
Pourya Shamsi
Lin Shan
Peng Shang
Asma Ahmad Shariff
Farnaz Shayegh
Jiaju She
Tarik Shehata
Chong Shen
Dongya Shen
Jiyun Shen
Junfeng Shi
Long Shi
Yi Shi
Zhefu Shi
Cai Shijie
Takayuki Shimizu
Cheolkyu Shin
Brian Shinn
Rostam Shirani
Ghasem Naddafzadeh Shirazi
Akhilesh Shrestha
Bharat Shrestha
Alain Sibille
Stephan Sigg
Osvaldo Simeone
Eric Simon
Amanpreet Singh
Ishaan Bir Singh
Kamal Singh
Brajendra Kumar Singh
Pierre Siohan
Iana Siomina
Rajendra Prasad Sirigina
Spyros Skarvelis-Kazakos
Nikolaos Skentos
Charalabos Skianis
Dirk T.M. Slock
Hing-Cheung So
Iker Sobron
Shabnam Sodagari
Termpong Soithong
Nadezda Sokolova
Samy Soliman
Christoph Sommer
Houbing Song
Iickho Song
Lingyang Song
Qi Song
Qingyang Song
Wei Song
Xuegui Song
Yi Song
Reza Soosahabi
Edgar B. Souza
Petros Spachos
Cormac Sreenan
Sriram Sridharan
Paweł Sroka
Thomas Staub
Athanasios Stavridis
Heidi Steendam
Gerhard Steinboeck
Alex Stephenne
Corneliu Eugen D. Sterian
Enrique Stevens-Navarro
Marc St-Hilaire
Christoph Studer
Gordon Stüber
Jingkai Su
Yuping Su
Yutao Sui
Timo Sukuvaara
Feifei Sun
Gaofei Sun
Hongjian Sun
Shunqiao Sun
Sun Sun
Wanlu Sun
Yang Sun
Chang Kyung Sung
Himal Suraweera
Erwan Suteau
Hajime Suzuki
Michal Sybis
Leszek Szczecinski
Sebastian Szyszkowicz
Ali Akbar Tadaion
Abd El-Hamid Taha
Omid Taheri
Abbas Taherpour
Shahriar Tajbakhsh
Jun-ichi Takada
Kazuaki Takeda
Kazuki Takeda
Osamu Takyu
Ahmet Cagatay Talay
Le Thanh Tan
Mario Tanda
Helen Tang
Yi Tang
Hidekazu Taoka
Poramate Tarasak
Naser Tarhuni
Mohammad Tarique
Charles Tatkeu
Desmond P Taylor
Keov Kolyan Teav
Chintha Tellambura
Kemal Tepe
Lakshmi Thanayankizil
Amila P. K. Tharaperiya Gamage
John Thompson
Van Vu Thuong
Ruiyuan Tian
Ran Timar
Ho Ting Cheng
Olav Tirkkonen
Fethi Tlili
Ba Lam To
Stefano Tomasin
Andrea Tonello
Jun Tong
Patrick Tooher
Hakan Topakkaya
Seyed Mohammad Ali Torabi
Mohammad Torabi
Paulo Torres
Johan Torsner
Dimitris Toumpakaris
Khanh Tran Gia
Khoa Tran Phan
Alicia Triviño
Ha Duyen Trung
Theodoros Tsiftsis
Dimitris Tsolkas
Masato Tsuru
Damla Turgut
Attila Török
Carlos Ubeda
Carlos Eduardo Uc Rios
Kazuhiro Uchiyama
Bernard Uguen
Arijit Ukil
Oktay Ureten
Suzan Ureten
Tomas Uricar
Paulo Urriza
Refik Fatih Ustok
Murat Uysal
Siva Ram Krishna Vadali
Tadashi Wadayama
Mojtaba Vaezi
Aditya Wagh
Reza Monir Vaghefi
Sonia Waharte
Matthew Valenti
Dieter Van Welden
Martijn van Eenennaam
Samuel Van de Velde
Hong Wan
Alessandro Vanelli-Coralli
Bo Wang
Chung-Wei Wang
Guangde Wang
Hao Wang
He Wang
Jian Wang
Jing Wang
Jun Wang
Junyi Wang
Nan Wang
Ping Wang
Rui Wang
Sen-Hung Wang
Shan Wang
Shiqiang Wang
Shuai Wang
Sichun Wang
Jin Soo Wang
Tao Wang
Wei Wang
Xianbin Wang
Xiaowei Wang
Xijun Wang
Yichen Wang
Yuanye Wang
Zhuwei Wang
Anubala Varikat
Vineeth Varma
K. C. B. Wavegedara
F. J. Vazquez-Araujo
Gonzalo Vazquez-Vilar
Tobias Weber
Anne Wei
Hung-Yu Wei
Claudio Weidmann
Elias Weingärtner
Petra Weitkemper
Benny Vejlgaard
Chih-Yu Wen
Jiangchuan Wen
Jeng-Feng Weng
Zhang Wenjie
Bart Vermeulen
Thomas Werthmann
Younghoon Whang
Javier Vía
Rolland Vida
Stefan Videv
Carlos Alberto Vieira Campos
Fausto Vieira
Ingmar Vierhaus
Ingo Viering
Jim Wight
Torbjörn Wigren
Joachim Wilharm
Steve Wilson
Wantanee Viriyasitavat
Lars Wischhof
Giorgio Vitetta
Federica Vitiello
Emmanuelle Vivier
Jens Voigt
Richard Wolff
Mojca Volk
Seung-Hwan Won
Y. D. Wong
W K Wong
Kampol Woradit
Sebastian Vorköper
Demosthenes Vouyioukas
Ha Nguyen Vu
Celimuge Wu
Chengyu Wu
Chun-Hsien Wu
Guangen Wu
Hanguang Wu
Huai-Kuei Wu
Jinsong Wu
Keying Wu
Liang Wu
Peiran Wu
Tsung-Cheng Wu
Yating Wu
Dejan Vukobratovic
Dirk Wübben
Jani Väre
Dionysis Xenakis
Lucy Xi
Minghua Xia
Jie Xiang
Weidong Xiang
Ming Xiao
Weiyao Xiao
Yuanzhang Xiao
Jiang (Linda) Xie
Lang Xie
Liguang Xie
Renchao Xie
Zhang Xiuning
Datong Xu
Fangmin Xu
Hui Xu
Jing Xu
Peng Xu
Ran Xu
Rongtao Xu
Wen Xu
Yi Xu
Zhemin Xu
Peng Xue
Michel Yacoub
Pradeepa Yahampath
Tara Yahiya
Akira Yamaguchi
Ryo Yamamoto
Chaoxing Yan
Wu Yan
Zhi Yan
Boyan Yanakiev
Ang Yang
Chao Yang
Hong Yang
Hongwei Yang
Jesse Yang
Hyun Jong Yang
Kun Yang
Lie-Liang Yang
Nan Yang
Shaoshi Yang
Shaoyun Yang
Tao Yang
Yaoqing Yang
Yingxiang Yang
Zhang Yang
Zhe Yang
Kazuto Yano
Yaser
Sadaf Yasmin
Kok Lim Alvin Yau
Chun Kin Au Yeung
Jiazi Yi
Youwen Yi
Zhihang Yi
H. Birkan Yilmaz
Ferkan Yilmaz
Harun Yilmaz
Wenshan Yin
Zuoliang Yin
Chen Yiping
Akihisa Yokoyama
Abbas Yongacoglu
Donghun Yoon
Maram Bani Younes
David Young
Abdelhamid Younis
Mohamed Younis
S. Younis
Muhammad Yousaf
Chansu Yu
Lei Yu
Y. T. Yu
Yiwei Yu
Nam Yul Yu
Yu Yuan
Zhou Yuan
Guosen Yue
Hao Yue
Chau Yuen
Ahmed H. Zahran
Alenka Zajic
Yuriy Zakharov
Randa Zakhour
Ahmed Zaki
Yasir Zaki
Alessio Zappone
Charilaos C. Zarakovitis
Hua Zeng
Hui Zeng
Liaoyuan Zeng
Hans-Jürgen Zepernick
Engin Zeydan
Chao Zhai
Chao Zhang
Ge Zhang
Guodong Zhang
Guowei Zhang
Haijun Zhang
Hong Zhang
Jianshu Zhang
Jie Zhang
Jingtao Zhang
Junfeng Zhang
JW Zhang
Le Zhang
Liang Zhang
Liqing Zhang
Min Zhang
Qi Zhang
Qingwei Zhang
Qixun Zhang
Rongqing Zhang
Shengli Zhang
Sihai Zhang
Siwei Zhang
Wenyi Zhang
Xi Zhang
Yang Zhang
Yu Zhang
Zhenghao Zhang
Zhengyu Zhang
Zhenxia Zhang
Zhonghao Zhang
Zhongshan Zhang
Zhou Zhang
Zhangjun
Bingxuan Zhao
Chuming Zhao
Guodong Zhao
Lian Zhao
Liqiang Zhao
Pengkai Zhao
Xing Zhao
Yue Zhao
Song Zhenfeng
Changliang Zheng
Guanbo Zheng
Jianping Zheng
Jun Zheng
Lei Zheng
Naizheng Zheng
Yousi Zheng
Wang Zhenyong
Ghayet el mouna Zhioua
Zhong Chen
Dizhi Zhou
Guangxia Zhou
Qi Zhou
Ruolin Zhou
Xin Sheng Zhou
Xiaobo Zhou
Yuan Zhou
Zhendong Zhou
Zhigang Zhou
Cheng Zhu
Jincao Zhu
Jing Zhu
Xu Zhu
Yajun Zhu
Sotirios G. Ziavras
Milan Zivkovic
Nikola Zlatanov
Yulong Zou
Alf Zugenmaier
Mohammad Zulhasnine
Jing Zuo

# Opening Plenary Tuesday 4 September 2012

***Tuesday 4 September 2012, 8:30–10:30 (2000AB)***

## *Current Developments and Challenges towards Intelligent Transportation Systems*

**Jean Luc Bérubé,** *President, Communications Research Center Canada*

Innovative spectrum science and technology is critical to support spectrum management in Canada and optimize its usage. To fulfill its mandate of providing advice for the spectrum policy framework and addressing the challenge of wireless spectrum demand outstripping available supply, CRC has developed and added LTE capability to its wireless test network. This test network enables studies of the performance and capabilities of a wide variety of emerging wireless technologies, and supports the government's efforts to maximize the usability of wireless spectrum in Canada. The LTE test network infrastructure can support analysis of intelligent transport systems (ITS), independent handover implementation, as well as mobile wireless offloading technologies. The concept of the cognitive femtocell network is under development as one of the milestones in addressing ITS and networked vehicle needs. Current work on highly adaptable wireless platforms will also be presented, and new research opportunities will be highlighted.

In 2009, Dr. **Jean Luc Bérubé** joined CRC as Vice-President of Broadband Network Technologies Research. He was named president in 2011. Dr. Bérubé began his career in 1984 with Canadian Marconi Company, where he pioneered the use of Field Programmable Gate Arrays (FPGA). He joined Nortel in 1993, leading teams designing advanced telecommunications equipment. He then moved to Motorola in 1997 and later became Senior Manager, Field Applications Engineering at Altera. Dr. Bérubé holds a B. Sc. in Electrical Engineering from the University of New Brunswick in Fredericton, N.B., an M.Sc.A. (Génie électrique, 1987) from Montréal's École Polytechnique, and a Ph.D. in Electrical Engineering (1995) from the University of New Brunswick.

# Plenary Wednesday 5 September

***Wednesday 5 September 2012, 8:45–9:30 (2000AB)***

## *The Renaissance of Wireless Communications in the Massively Broadband® Era*

**Ted Rappaport**, *David Lee/Ernst Weber Chair of Electrical Engineering at NYU-Poly*

This talk outlines the coming revolution of wireless communications in the 30 to 300 GHz bands, and describes recent accomplishments in circuits and antenna designs, including very recent work into millimeter-wave urban cellular communications. The talk then illustrates how many of the same problems in wireless communications signal processing can be applied to modern medicine, and highlights new medical research problems that may soon be solved by wireless communications technologies and methodologies.

**Theodore (Ted) Rappaport** currently serves as the David Lee/Ernst Weber Chair of Electrical and Computer Engineering at NYU-Poly, and is a professor at NYU's Courant Institute of Mathematical Sciences and the NYU School of Medicine. Rappaport is founding director of NYU WIRELESS, a new kind of academic research center that combines wireless communications engineering and computer science with the practice of medicine and health care. Earlier in his career, he founded two of the largest and most highly regarded research programs in wireless communications at Virginia Polytechnic Institute and State University (Virginia Tech) and The University of Texas at Austin (UTA). He also launched two companies that were instrumental in the deployment of modern day cellular telephone networks. Rappaport holds more than 100 patents that are issued or pending, and has authored numerous books including the most popular textbook in the wireless engineering field. In 1990 at Virginia Tech, he founded the Mobile and Portable Radio Research Group (MPRG, now Wireless@VT), a center that became a leading producer of research and young engineers for the booming cellular telephone industry, and founded the Wireless Networking and Communications Group (WNCG) at UTA in 2002. He received the Marconi Young Scientist Award in 1990, the Terman Award from ASEE in 2002, The IET Sir Monty Finniston Medal in 2011, and the IEEE William E. Sayle Education Award in 2012. He was recently named a Distinguished Engineering Alumni of Purdue University.

***Wednesday 5 September 2012, 9:30–10:30 (2000AB)***

### *Solving the Too Much Data Paradox with Small cells, Relays and HetNets*

**Reinaldo Valenzuela**, *Director, Wireless Comms. Research Dept., BellLabs, Alcatel-Lucent*

Data traffic on wireless networks is experiencing unprecedented and explosive growth fueled by smart devices and a plethora of new applications. At the same time, there is a limited choice of technologies that may continue to provide the required increases in system capacity and spectral efficiency at an affordable cost. Small cells, Heterogeneous Networks (HetNets) and Relays may offer an economic alternative and have attracted intense interest. I will review several key questions which need to be answered for these technologies to deliver their full potential.

**Reinaldo A. Valenzuela** obtained his B.Sc. at the University of Chile, and his Ph.D. from Imperial College of Sc. and Tech., U. of London, England. At Bell Laboratories, he carried out indoor microwave propagation measurements and developed statistical models. He also worked on packet reservation multiple access for wireless systems and optical WDM networks. He became Manager, Voice Research Dept., at Motorola Codex, involved in the implementation integrated voice and data packet systems. On returning to Bell Laboratories he was involved in propagation measurements and ray tracing propagation prediction. He received the Distinguished Member of Technical Staff award and is Director of the Wireless Communications Research Department. He is currently engaged in MIMO / space time systems achieving high capacities using transmit and receive antenna arrays. He is a Fellow of the IEEE. He has been editor for the IEEE Transactions on Communications and the IEEE Transactions on Wireless. He has published over 130 papers and has 12 patents. He has over 10 000 Google Scholar citations and he is a 'Highly Cited Author' In Thomson ISI and a Fulbright Senior Specialist. He is the 2010 recipient of the IEEE Eric E. Sumner Award.

## Plenary Thursday 6 September

***Thursday 6 September 2011, 9:00–10:00 (2000AB)***

### *Wireless Network Coding - to PHY or not to PHY*

**Muriel Médard**, *Professor, MIT*

The intersection of network coding and wireless communications leads to potentially rich interactions among layers. In this talk, we examine whether coding in ways that blend network coding and PHY layer coding is beneficial. In the high SNR regime, we argue that analog network coding, in effect amplify and forward, is optimal, thus requiring only PHY-layer ISI coding. In the low SNR regime, we argue that network coding and PHY coding can be separated. A secondary effect of such separation is that network planning may lend itself to elegant design. In intermediate regimes, equivalence theory provides bounds that point to the frequent desirability of separating network coding and PHY coding, but no asymptotic optimality. However, we illustrate, through the use of network coding to replace MAC level ACKs and hybrid ARQ, that separation can lead in practice to considerable throughput gains, on the order of a factor of 6.

**Muriel Médard** is a Professor of Electrical Engineering at MIT. She was previously an Assistant Professor in the ECE Departmentat UIUC and a Staff Memberat MIT Lincoln Laboratory. She received B.S. degrees in EECS, in Mathematics, and in Humanities, as well as M.S. and Sc D. degrees in EE, all from MIT. She has served as an Associate Editor for the Optical Communications and Networking Series of the IEEE Journalon Selected Areas in Communications, the IEEE Transactionson Information Theory and the OSA Journal of OpticalNetworking. She has served as a Guest Editor for the IEEE Journal of Lightwave Technology, the IEEE Transactions on Information Theory (twice), the IEEE Journal on Selected Areas in Communications and the IEEE Transactions on Information Forensic and Security. She serves as an associate editor for the IEEE/OSA Journal of Lightwave Technology. She is a member of the Board of Governors of the IEEE Information Theory Society and currently serves as First Vice-President. She has served as TPC co-chair of ISIT, WiOpt and CONEXT. She was awarded the 2009 IEEE Communication Society and Information Theory Society Joint Paper Award, the 2009 IEEE William R. Bennett Prize in the Field of Communications, and the 2002 IEEE Leon K. Kirchmayer Prize Paper Award. She was co-winner of the 2004 MIT Harold E. Edgerton Faculty Achievement Award. In 2007, she was named a Gilbreth Lecturer by the National Academy of Engineering. Professor Médard's research interests are in the areas of network coding and reliable communications, particularly for optical and wireless networks.

# Panel Sessions

***Tuesday 4 September 2012, 18:00–19:30 (2000AB)***

## *A Glimpse Beyond the Wireless Horizon*

| | | |
|---|---|---|
| **Chair:** | **Lajos Hanzo** | *University of Southampton* |
| **Panelists:** | **Gerhard Fetweiss** | *Technische Universität Dresden* |
| | **Ted S. Rappaport** | *NYU-Poly* |
| | **Reinaldo A. Valenzuela** | *University of California at Berkeley* |

Whilst the operators and service providers are engaged in rolling out the LTE network, researchers are aiming for further enriching the wireless landscape and for enhancing the achievable performance of the existing standards. Numerous advanced techniques are combined for the sake of approaching the theoretically achievable performance, but accurate measurements indicate that the practical systems operate at a fraction of their theoretical capacity estimated under the idealized simplifying assumptions perfect channel estimation and synchronization. Massive MIMOs, small cells, COMP, cognitive radios and other cooperative solutions combined with carrier aggregation techniques potentially operating even across different standard systems have the promise of substantial further capacity gains, leading to the concept of heterogeneous networks (HetNets). However, an abundance of spectral resources are available at higher carrier frequencies, towards the upper end of the RF band. This panel will aim for predicting the medium to long-term evolution of the wireless information infra-structure, which has become such a vital component of a vibrant global economy.

**Lajos Hanzo** (http://www-mobile.ecs.soton.ac.uk) FREng, FIEEE, FIET, Fellow of EURASIP, DSc received his degree in electronics in 1976 and his doctorate in 1983. In 2009 he was awarded the honorary doctorate ``Doctor Honoris Causa" by the Technical University of Budapest. During his 35-year career in telecommunications he has held various research and academic posts in Hungary, Germany and the UK. Since 1986 he has been with the School of Electronics and Computer Science, University of Southampton, UK, where he holds the chair in telecommunications. He has successfully supervised 80 PhD students, co-authored 20 John Wiley/IEEE Press books on mobile radio communications totalling in excess of 10 000 pages, published 1250+ research entries at IEEE Xplore, acted both as TPC and General Chair of IEEE conferences, presented keynote lectures and has been awarded a number of distinctions. Currently he is directing a 100-strong academic research team, working on a range of research projects in the field of wireless multimedia communications sponsored by industry, the Engineering and Physical Sciences Research Council (EPSRC) UK, the European IST Programme and the Mobile Virtual Centre of Excellence (VCE), UK. He is an enthusiastic supporter of industrial and academic liaison and he offers a range of industrial courses. He is also a Governor of the IEEE VTS. During 2008 - 2012 he was the Editor-in-Chief of the IEEE Press and since 2009 he has been a Chaired Professor also at Tsinghua University, Beijing. For further information on research in progress and associated publications please refer to http://www-mobile.ecs.soton.ac.uk

**Gerhard Fettweis** earned his PhD degree from Aachen University of Technololgy (RWTH) in 1990. He is IEEE Fellow, and active in organizing conferences (e.g. IEEE ICC 2009) and workshops. From 1990 to 1991, he was Visiting Scientist at the IBM Almaden Research Center in San Jose, CA, developing signal processing innovations for IBM's disk drive products. From 1991 to 1994, he was a Scientist with TCSI Inc., Berkeley, CA, responsible for signal processor development projects for cellular phone chip-sets. Since 1994 he holds the Vodafone Chair at Technische Universität Dresden, Germany. During this time the chair has spunout nine start-ups: Systemonic, Radioplan, Signalion, InCircuit, Dresden Silicon, Freedelity, RadioOpt, Blue Wonder Communications, InRadios.

**Theodore (Ted) Rappaport**'s biography appear on page 11.
**Reinaldo A. Valenzuela**'s biography appear on page 12.

***Wednesday 5 September 2012, 17:00–18:30 (2000AB)***

## *The Myths and Realities of Green Wireless*

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| **Chair:** | **Lajos Hanzo** | *University of Southampton* |
| **Panelists:** | **Charles Despins** | *Prompt-Quebec* |
| | **Friedrich K. Jondral** | *University of Karlsruhe* |
| | **Wen Tong** | *Huawei* |

There are over four billion wireless devices across the globe and the achievable data rate increased more than three orders of magnitude over the past three decades. This was achieved with the aid of sophisticated adaptive modulation, coding, MIMOs, cell-size reduction, cooperation and a host of other radical enabling techniques. However, the required bit-energy/noise ratio cannot be reduced below the minimum value predetermined by the capacity and approaching the capacity necessitates an ever-increasing processing

complexity, whilst additionally imposing an increased delay. The cell-size reduction has been shown to be one of the most efficient technique of reducing the energy consumption, but this potentially increases the infrastructure costs and the number of hand-overs to be carried out in haterogeneous networks. This panel will embark on discussing the realistic potential of a range of techniques that may be invoked in the interest of improving the energy-efficiency of wireless networks.

**Lajos Hanzo**'s biography appears on page 13.

**Charles Despins**' career has spanned more than 25 years in both the academic and industry segments of the information and communications technologies (ICT) sector. In addition to his academic research work in the Université du Québec network, he has held various posts in the private sector, namely at CAE Electronics, Microcell Telecommunications (Canadian cellular operator) and at Bell Nordiq Group (a network operator in rural and northern areas of Canada) as vice-president and chief technology officer. He has also worked as a consultant for wireless network deployments in India and China. Since January 2003, he has been President and CEO of Prompt inc., an ICT university-industry research and development consortium. In addition, he is a faculty member at École de Technologie Supérieure (Université du Québec) in Montreal, with research interests in wireless communications. He is also a guest lecturer at the Desautels faculty of Management at McGill University in Montreal. He holds a bachelor's degree in electrical engineering from McGill University in Montreal, Canada as well as M.Sc. and Ph.D. degrees, also in electrical engineering, from Carleton University in Ottawa, Canada. Dr. Despins is a Fellow (2005) of the Engineering Institute of Canada and a recipient (2006) of the Outstanding Engineer award from IEEE Canada. He is currently a frequent advocate on Green ICT issues.

**Friedrich K. Jondral** received a Diploma in mathematics and a Doctoral degree in natural sciences from the Technische Universität Braunschweig, Germany, in 1975 and 1979, respectively. During the winter semester 1977/78 he was a visiting researcher to the Department of Mathematics, Nagoya University, Japan. From 1979 to 1992 Dr. Jondral was an employee of AEG-Telefunken (now European Aeronautic Defence and Space Company, EADS), Ulm, Germany, where he held various research, development and management positions. His main activities during this time were in the fields of shortwave radio, signal analysis and radio direction finding. Besides his job, from 1981 to 1992 Dr. Jondral lectured on applied mathematics at the Universität Ulm where he was appointed Adjunct Professor in 1991. Since 1993 he has been Full Professor and Director of the Institut für Nachrichtentechnik at the Universität Karlsruhe (TH), Germany. Here, from 2000 to 2002, he served as the Dean of the Department of Electrical Engineering and Information Technology. During a sabbatical in the summer semester 2004, Dr. Jondral was a visiting faculty to the Mobile and Portable Radio Research Group of Virginia Tech, Blacksburg, VA. His current research interests are in the fields of ultra wideband communications, software defined and cognitive radio, signal analysis, pattern recognition, network capacity optimization and dynamic spectrum sharing.

Dr. **Wen Tong** is the vice president of Wireless Research and CTO of Wireless of Huawei Technologies Co.,Ltd. Prior to joining Huawei in March 2009. Dr. Wen Tong was the Nortel Fellow and Head of the Network Technology Labs at Nortel. He received the M.Sc and Ph.D degrees in Electrical Engineering in 1986 and 1993 and joined the Wireless Technology Labs at Bell Northern Research in 1995. He has pioneered fundamental technologies in wireless with 90 granted US patents and more than 200 patents filings.

Dr. Tong has conducted the advanced research work spanning from 1G to 4G wireless at Nortel. From 1997 to 1999, he was responsible for the prototyping of advanced CDMA technology which led industry's first 3G wireless packet data sessions using CDMA2000 1xRTT technology in the field. He was one of the critical inventors of turbo coding interleaver, a key enabler that boosts speed and efficiency of 3G networks, which has been adopted for all 3G/4G standards. From 1998 to 2006, he had been a driving force in developing foundational technologies for all the 4G wireless networks– OFDM-MIMO. He is an industry-recognized pioneer on OFDM-MIMO. He has been a key contributor and initiator to 3GPP (UMTS and LTE), 3GPP2 (CDMA 1xRTT 1xEV-DO and UMB), and IEEE802.16e (WiMAX), IEEE802.16j (Mobile Multi-Hop Relay) standards.In 2006, and 2007, his team was twice-winner of Nortel Technology Excellent Award (highest level R&D award). Since 2007, Dr. Tong had been the director of Wireless Technology Labs. In 2008, Dr. Tong was the head of Network Technology Labs, responsible for Nortel's global strategic technologies research and development. He was member of Executive Edge team.

In 2007, Dr. Tong was inducted as Nortel Fellow, a lifetime honor bestowed to selected 5 individuals in Nortel's R&D community in Nortel's 114 years history. Dr. Tong was Nortel's most prolific inventor. Dr. Tong serves at the NSERC discovery grant committee.

# Industry Sessions

***Wednesday 5 September 2012, 11:00–12:30 (208AB)***

## *InterDigital's 5G vision*

**InterDigital**

This InterDigital vision presentation will touch on new thinking in wireless evolution to fulfill personal ultra broadband on the go target for the next decade. This talk will delve into new strategies to address the bandwidth crunch and why we need them. We will start off with what the past tells us about where we are going tomorrow and move on to understand why small cells and Wi-Fi are so important in a winning strategy.

***Wednesday 5 September 2012, 14:00–15:30 (208AB)***

### *Accelerating Wireless Applications Waveform Design, Implementation and Validation using Model-Based Design Flow*

**Nutaq**

For the prototyping of modern complex communication systems, A model-based design approach speeds up the whole design chain from simulation to implementation, tests and validation. This workshop intends to demonstrate the usefulness of the model-based approach through the model-based implementation of a 2x2 QAM16 OFDM PHY layer transceiver. Initiated from simulation, the implementation finally runs on an FPGA-based hardware and transmit/receive over an air interface.

***Wednesday 5 September 2012, 16:00–17:30 (208AB)***

### *RF Test and Measurement: Connector Care and Computer Connectivity*

**Agilent**

Research and Development in RF and microwave technologies often includes a test phase which involves making practical measurements on prototype systems or devices to compare theoretical data to actual test results. This means utilizing specialized test and measurement instrumentation. Two aspects of this include connecting to the device under test and gathering test data to a computer. This tutorial will delve into the practical issues surrounding the said two aspects.

## Registration

Registration will take place in the 2000 Hall entrance foyer. Hours are:

- Monday 5 September 0730 – 1730 *
- Tuesday 6 September 0730 – 1730
- Wednesday 7 September 0730 – 1730
- Thursday 8 September 0730 – 1500

* Also outside the reception on Monday evening for ticket pickup only.

## Breaks & Social Events

Coffee breaks will take place in the exhibit area in 2000C. Lunches, which are included in the full registration, will be served in 2000AB. You will need the ticket included in your registration packet to gain entry. The panel on Tuesday evening is open to all attendees – no ticket is required. Light snacks and beverages will be served.

The reception on the Monday evening will be held offsite in the Observatoire de la Capitale. Entrance to the reception is also by ticket only, so please remember to bring your tickets. If you have not yet registered, you can pick up your tickets at the door. The banquet is also offsite at the Capitole Theatre. Again you will need to remember your ticket to gain entry.

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## Program at a Glance : Monday 3 September 2012

| | | 2105 | 2101 | 207 | 208AB (G) |
|---|---|---|---|---|---|
| 7:30-17:30 | | Registration (2000 Foyer Entrance) | | | |
| 9:00-10:30 | | T1/12: Channel Sounding, Data Analysis & Modelling | T3: Cooperative Communications | T5: Stochastic Geometry and Random Graphs | W2: Green Information and Communications |
| 10:30-11:00 | | Coffee (Hall 2000 Foyer) | | | |
| 11:00-12:30 | | T1/12: Channel Sounding, Data Analysis & Modelling | T3: Cooperative Communications | T5: Stochastic Geometry and Random Graphs | W2: Green Information and Communications |
| 12:30-13:30 | | Lunch Break (No lunch provided) | | | |
| 13:30-15:00 | | T2/12: Channel Sounding, Data Analysis & Modelling | T4: Cognitive Radio and Software Defined Radio | T6: Cross-Layer Design for Efficient Wireless Networks | |
| 15:00-15:30 | | Coffee (Hall 2000 Foyer) | | | |
| 15:30-17:00 | | T2/12: Channel Sounding, Data Analysis & Modelling | T4: Cognitive Radio and Software Defined Radio | T6: Cross-Layer Design for Efficient Wireless Networks | |
| 19:00-21:00 | | VTC Welcome Reception (Observatoire de la Capitale) | | | |

# VTC2012-Fall Technical Program

# Tuesday 4 September 2012

*Tuesday 4 September 2012 11:00-12:30 2103*

## 1A: Localization and Tracking

**1 Direction of arrival estimation for MIMO systems employing constellation-based precoding**
Geoffrey Colman, Communications Research Centre, Canada; Michelle Wang, Defence Research and Development Canada, Canada; and Susan Watson, Defence Research and Development Canada, Canada

**2 Localization in Wireless Networks using Decision Trees and K-means Clustering**
Khalid Almuzaini, University of Victoria, Canada; and Aaron Gulliver, University of Victoria, Canada

**3 LoWCA: Localization and Tracking Techniques Using a Wireless Sensor Network in Confined Areas - Study of the Impact of the Memory Size of Nodes**
Chakib Baouche, LIMOS-CNRS, France; Antonio Freitas, LIMOS-CNRS, France; and Michel Misson, LIMOS-CNRS, France

**4 A novel motion tracking system with sparse Radio-Frequency sensor network**
Aidong Men, Beijing University of Posts and Telecommunications, China; Guang Zhao, Beijing University of Posts and Telecommunications, China; Yun Zhou, Beijing University of Posts and Telecommunications, China; and Yi Zheng, Beijing University of Posts and Telecommunications, China

*Tuesday 4 September 2012 11:00-12:30 207*

## 1B: Network Topology

**1 Delay-conscious Federation of Multiple Wireless Sensor Network Segments using Mobile Relays**
Jerome L.V.M. Stanislaus, University of Maryland, Baltimore County, United States; and Mohamed Younis, University of Maryland, Baltimore County, United States

**2 Topology Reconfiguration in Cognitive Radio Networks using Ant Colony Optimization**
Qixun Zhang, Beijing University of Posts and Telecommunications, China; Qian He, Beijing University of Posts and Telecommunications, China; and Ping Zhang, Beijing University of Posts and Telecommunications, China

**3 Gateway Placement in Hybrid MANET-Satellite Networks**
Monia Hamdi, Télécom Bretagne, France; Laurent Franck, Télécom Bretagne, France; and Xavier Lagrange, Télécom Bretagne, France

**4 A Novel Link Scheduling Algorithm for Spatial Reuse in Wireless Networks**
Weiqiang Liu, University of Science and Technology of China, China; Dandan Miao, University of Science and Technology of China, China; Xiaohui Chen, University of Science and Technology of China, China; and Weidong Wang, University of Science and Technology of China, China

**5 Multi-Layer Mobility Load Balancing in a Heterogeneous LTE Network**
Panagiotis Fotiadis, Michele Polignano, Aalborg University, Denmark; Daniela Laselva, Benny Vejlgaard, Preben Mogensen, Nokia Siemens Networks Research Center, Aalborg, Denmark; Ralf Irmer and Neil Scully, Vodafone Group R&D, United Kingdom

*Tuesday 4 September 2012 11:00-12:30 2105*

## 1C: Dynamic Spectrum Access

**1 On the interplay of sensing and erasure correctionin opportunistic spectrum access**
Muhammad Moazam Azeem, Orange Labs, FranceTelecom, France; Patrick Tortelier, Orange Labs, FranceTelecom, France; and Didier Le Ruyet, CNAM, Paris, France

**2 Learning-Based Channel Selection of VDSA Networks in Shared TV Whitespace**
Si Chen, Worcester Polytechnic Institute, United States; Rama Vuyyuru, Toyota InfoTechnology Center USA, United States; Onur Altintas, Toyota InfoTechnology Center, Co., Ltd., Japan; and Alexander Wyglinski, Worcester Polytechnic Institute, United States

**3 Dynamic Channel Assignment using Ant Colony Optimization for Cognitive Radio Networks**
Qian He and Ping Zhang, Key Lab. of Universal Wireless Communications, Ministry of Education Wireless Technology Innovation Lab (WTI), Beijing University of Posts and Telecommunications, Beijing, China

**4 Opportunistic Spectrum Access with Hopping Transmission Strategy: A Game Theoretic Approach**
Mahsa Derakhshani, McGill University, Canada; and Tho Le-Ngoc, McGill University, Canada

**5 Dynamic Spectrum Auction with Time Optimization in Cognitive Radio Networks**
Guangen Wu, Xi'an Jiaotong University, China; Pinyi Ren, Xi'an Jiaotong University, China; and Qinghe Du, Xi'an Jiaotong University, China

*Tuesday 4 September 2012 11:00-12:30 2101*

## 1D: Precoding for Cooperation

**1 Joint Source-Relay Precoder and Decoder Designs for Amplify-and-Forward MIMO Relay System with Imperfect Channel State Information**
Jianhua Zhang, Wei Bao, Ping Zhang and Qiang Wang, Beijing University of Posts and Telecommunications, China

**2 A Two-Step Precoding Scheme for Multi-User Joint Transmission in Coordinated Multi-Point System**
Datong Xu, Xi'an Jiaotong University, China; and Pinyi Ren, Xi'an Jiaotong University, China

**3 Distributed Power Allocation Schemes for precoded Multicell MISO-OFDM Systems**
Reza Holakouei, DETI, Instituto de Telecomunicações/University of Aveiro, Portugal; Adão Silva, DETI, Instituto de Telecomunicações/University of Aveiro, Portugal; Rui Dinis, Instituto de Telecomunicações, Faculdade de Ciências e Tecnologia, Univ. Nova de Lisboa, Portugal; and Atílio Gameiro, DETI, Instituto de Telecomunicações/University of Aveiro, Portugal

**4 Iterative Joint Source and Relay Optimization for Multiuser MIMO Relay Systems**
Junjie Zeng, Zhi Chen and Lingxiang Li, University of Electronic Science and Technology of China, China

**5 Distributed Precoding Techniques for Weighted Sum Rate Maximization in MIMO Interfering Broadcast Channels**
Hyun-Joo Choi, Korea University, South Korea; Seok-Hwan Park, New Jersey Institute of Technology, United States; Sang-Rim Lee, Korea University, South Korea; and Inkyu Lee, Korea University, South Korea

*Tuesday 4 September 2012 11:00-12:30 206B*

## 1E: Femto I

**1 Joint Macro and Femto Field Performance and Interference Measurements**
Niels Terp Kjeldgaard Jørgensen, Aalborg University, Denmark; Tero Isotalo, Tampere University of Technology, Finland; Klaus Ingemann Pedersen, Nokia Siemens Networks, Denmark; and Preben Elgaard Mogensen, Aalborg University, Denmark

**2 Distributed Cooperative Q-learning for Power Allocation in Cognitive Femtocell Networks.**
Hussein Saad, Nile University, Egypt; Amr Mohamed, Qatar University, Qatar; and Tamer ElBatt, Nile University, Egypt

**3 MCS and Sub-band Selection for Downlink Interference Coordination in LTE-A Femtocells**
Olga Muñoz-Medina, Universitat Politècnica de Catalunya (UPC), Spain; Adrián Agustín, Universitat Politècnica de Catalunya (UPC), Spain; and Josep Vidal, Universitat Politècnica de Catalunya (UPC), Spain

**4 Resource Block Assignment for Interference Avoidance in Femtocell Networks**
Yu-Shan Liang, National Taiwan University, Taiwan; Wei-Ho Chung, Academia Sinica, Taiwan; Chia-Mu Yu, National Taiwan University, Taiwan; Chung-Hsiu Chung, Institute for Information Industry, Taiwan; Chih-Hsiang Ho, Institute for Information Industry, Taiwan; Sy-Yen Kuo, National Taiwan University, Taiwan; and Hongke Zhang, Beijing Jiaotong University, China

**5 Cluster-based Resource Allocation for Interference Mitigation in LTE Heterogeneous Networks**
Hao Tang, USTC, China; Peilin Hong, USTC, China; Kaiping Xue, USTC, China; and Jinlin Peng, USTC, China

*Tuesday 4 September 2012 11:00-12:30 2104A*

## 1F: Detection and Estiation I

**1 Tone Interference Estimation for OFDM Systems Using a Frequency Domain DFT**
Dongwoon Bai, Samsung, United States; Heejin Roh, Samsung, United States; and Jungwon Lee, Samsung, United States

**2 Efficient Inverse Cholesky Factorization for Alamouti Matrices in G-STBC and Alamouti-like Matrices in OMP**
Hufei Zhu, Huawei Technologies Co. Ltd., China; Ganghua Yang, Huawei Technologies Co. Ltd., China; and Wen Chen, Shanghai Jiao Tong University, China

**3 Low-complexity Rotated QAM Demapper for the Iterative Receiver Targeting DVB-T2 Standard**
YouZhe Fan, The Hong Kong University of Science and Technology, Hong Kong; and Chi-ying Tsui, The Hong Kong University of Science and Technology, Hong Kong

**4 On Subspace Noise Estimation for OFDM**
Afshin Haghighat, InterDigital Communications LLC, Canada

**5 Effects of Arbitrarily Spaced Subcarriers on Detection Performance in OFDM Radar**
Johannes Fink, Karlsruhe Institute of Technology, Germany; Martin Braun, Karlsruhe Institute of Technology, Germany; and Friedrich Jondral, Karlsruhe Institute of Technology, Germany

*Tuesday 4 September 2012 11:00-12:30 208AB*

## 1G: Mobility and Vehicle Traffic Models

**1 Efficient Floating Car Data Transmission via LTE for Travel Time Estimation of Vehicles**
Christoph Ide, TU Dortmund University, Germany; Timo Knaup, University Duisburg-Essen, Germany; Brian Niehoefer, TU Dortmund University, Germany; Daniel Weber, University Duisburg-Essen, Germany; Lars Habel, University Duisburg-Essen, Germany; Michael Schreckenberg, University Duisburg-Essen, Germany; and Christian Wietfeld, TU Dortmund University, Germany

**2 Vehicular Traffic Modeling Governed by Cellular Phone Trajectories**
Ryan Neighbour, University of Manitoba, Canada; Matthew Crowley, MTS Allstream, Canada; Shamir Mukhi, Canadian Network for Public Health Intelligence, Canada; M.R. Friesen, University of Manitoba, Canada; and R.D. McLeod, University of Manitoba, Canada

**3 RF-based Traffic Detection and Identification**
Amal Al-Husseiny, Egypt Japan University for Science and Technology (E-JUST), Egypt; and Moustafa Youssef, Alexandria University and E-JUST, Egypt

**4 Estimation of Average Vehicle Speeds Traveling onHeterogeneous Lanes Using Bluetooth Sensors**
Jorgos Zoto, University of Maryland, United States; Richard La, University of Maryland, United States; Masoud Hamedi, University of Maryland, United States; and Ali Haghani, University of Maryland, United States

*Tuesday 4 September 2012 11:00-12:30 2000C*

## 1P: Communications Posters

**1 Scalable PHY-Layer Security for Distributed Detection in Wireless Sensor Networks**
Reza Soosahabi, Louisiana State University, United States; and Mort Naraghi-Pour, Louisiana State University, United States

**2 DYGES: A network-aware Generation-Based Network Coding for multicast flows**
Youghourta Benfattoum, University of Paris-Sud, France; Steven Martin, University of Paris-Sud, France; and Khaldoun Al Agha, University of Paris-Sud, France

**3 A new dynamic reservation protocol for many-to-one multi-access with long propagation delay**
Priyatosh Mandal, Centre for Development of Telematics, India; and Swades De, Indian Institute of Technology Delhi, India

**4 A DTN routing scheme for quasi-deterministic networks with application to LEO satellites topology**
Rémi Diana, ISAE-TeSA / CNES / Thales Alenia Space, France; Emmanuel Lochin, Université de Toulouse, ISAE, TeSA, Toulouse, France; Cedric Baudoin, Thales Alenia Space, Toulouse, France; Emmanuel Dubois, CNES Toulouse, France; and Patrick Gelard, CNES Toulouse, France

**5 Dynamic Clusters Graph for Detecting Moving Targets using WSNs**
Farzaneh Razavi Armaghani, Monash University, Australia; Iqbal Gondal, Monash University, Australia; Joarder Kamruzzaman, Monash University, Australia; and David Green, Monash University, Australia

**6 CATWOMAN: Implementation and Performance Evaluation of IEEE 802.11 based Multi-Hop Networks using Network Coding**
Martin Hundebøll, Aalborg University, Denmark; Jeppe Ledet-Pedersen, Aalborg University, Denmark; Janus Heide, Aalborg University, Denmark; Morten V. Pedersen, Aalborg University, Denmark; Stephan A. Rein, Aalborg University, Denmark; and Frank H.P. Fitzek, Aalborg University, Denmark

**7 A Scheme to Support Concurrent Transmissions in OFDMA based Ad Hoc networks**
Hongyi Xiong, Queen Mary University Of London, United Kingdom; and Eliane Bodanese, Queen Mary University Of London, United Kingdom

**8 Optimization of Energy Efficiency for OFDMA Femtocell Networks based on Effective Capacity**
Zhenglei Huang, Hailun Xia, Zhimin Zeng, Beijing Key Laboratory of Network System Architecture and Convergence,Beijing University of Posts and Telecommunications, China; and Yinlong Liu, Institute of Acoustics,Chinese Academy of Sciences, China

**9 Interference-Aware Random Beam Selection for Spectrum Sharing Systems**
Mohamed Abdallah, Texas A&M University at Qatar, Qatar; Mostafa Sayed, Varkon Semiconductors, Egypt; Mohamed-Slim Alouini, King Abdallah University of ScienceTechnology, Saudi Arabia; and Khalid Qaraqe, Texas A&M University at Qatar, Qatar

**10 Exact Outage Probability Analysis for Relay-aided Underlay Cognitive Communications**
Zakaria El Moutaouakkil, Texas A&M University at Qatar, Qatar; Kamel Tourki, Texas A&M University at Qatar, Qatar; Khalid A. Qaraqe, Texas A&M University at Qatar, Qatar; and Samir Saoudi, Institut TELECOM - TELECOM Bretagne, France

**11 Interference Mitigation and Spectrum Sharing for Heterogeneous Networks Based on CQI Feedbacks**
James Li, NEC Labs China, China; Lei Jiang, NEC Labs China, China; and Ming Lei, NEC Labs China, China

**12 Optimal Strategy for QoS Provision under Spectrum Mobility in Cognitive Radio Networks**
Tao Guo, University of Surrey, United Kingdom; and Klaus Moessner, University of Surrey, United Kingdom

**13 Analysis of TV White Space Availability in Japan**
Tsuyoshi Shimomura, Fujitsu Laboratories Ltd., Japan; Teppei Oyama, Fujitsu Laboratories Ltd., Japan; and Hiroyuki Seki, Fujitsu Laboratories Ltd., Japan

**14 Interference Evaluation in Ad-Hoc Cognitive Radio Networks**
Mohammad Robat Mili, Univeristy of Manchester, United Kingdom; and Khairi Hamdi, University of Manchester, United Kingdom

**15 Cognitive AF Relay Schemes for Uplink Transmission in Macrocellular Networks**
Wenshan Yin, Xi'an Jiaotong University, China; Pinyi Ren, Xi'an Jiaotong University, China; Qinghe Du, Xi'an Jiaotong University, China; and Zhou Su, Waseda University, Japan

**16 Sensitivity Analysis of Location-aided Multi-user Scheduling Strategies to Imperfect Location Information**
Congzheng Han, Ofcom, United Kingdom; and Angela Doufexi, University of Bristol, United Kingdom

**17 LTE Fingerprinting Localization with Altitude**
Torbjorn Wigren, Ericsson AB, Sweden

**18 An Improved Distance Estimation Algorithm Based on Generalized CRT**
Ping Deng, Key Lab of Information Coding and Transmission, Southwest Jiaotong University, China; and Yunhe Cui, Key Lab of Information Coding and Transmission, Southwest Jiaotong University, China

**19 Performance Characterization of AOA Geolocation Systems using the von Mises Distribution**
Sichun Wang, Defence R&D Canada-Ottawa, Canada; Brad Jackson, Defence R&D Canada-Ottawa, Canada; and Robert Inkol, Defence R&D Canada-Ottawa, Canada

**20 Mobility Prediction based on Graphical Model Learning**
Huijun Li, RWTH Aachen University, Germany; and Gerd Ascheid, RWTH Aachen University, Germany

**21 An Improved Multihop Distance Estimation for DV-Hop Localization Algorithm in Wireless Sensor Networks**
Quanrui Wei, Ministry of Education Key Lab for Intelligent NetworksNetwork Security, China; Jiuqiang Han, Ministry of Education Key Lab for Intelligent NetworksNetwork Security, China; Dexing Zhong, Ministry of Education Key Lab for Intelligent NetworksNetwork Security, China; and Ruiling Liu, Ministry of Education Key Lab for Intelligent Networks and Network Security, China

**22 Enhanced WCDMA Fingerprinting Localization Using OTDOA Positioning Measurements from LTE**
Torbjorn Wigren, Ericsson AB, Sweden; Ari Kangas, Ericsson AB, Sweden; Ylva Jading, Ericsson AB, Sweden; Iana Siomina, Ericsson AB, Sweden; and Claes Tidestav, Ericsson AB, Sweden

**23 Convex Optimization-based Beamforming in Cognitive Radio Multicast Transmission**
Marko Beko Universidade Lusfona de Humanidades e Tecnologias , Portugal ; Slavisa Tomic UNINOVA, Portugal; Rui Dinis Instituto de Telecomunicações, Portugal; Vlatko Lipovac University of Dubrovnik, Croatia

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***Tuesday 4 September 2012 14:00-15:30 2103***

## 2A: CFO and Synchronization

**1 Enhanced Beaconless Synchronization for Regulatory Domain Specific IEEE 802.15.4g Smart Utility Networks**
Chin-Sean Sum, NICT, Japan; Fumihide Kojima, NICT, Japan; and Hiroshi Harada, NICT, Japan

**2 Cyclic Prefix Based Symbol Timing Synchronization Method for OFDM Systems by Using the Correlation Property of Preamble**
Junghwan Kim, The university of Toledo, United States; and Chong Wang, The University of Toledo, United States

**3 A Pilot-aided Frequency Offset Estimation Algorithm for OFDMA Uplink Systems**
Kilbom Lee, Korea University, South Korea; Sung-Hyun Moon, Korea University, South Korea; and Inkyu Lee, Korea University, South Korea

**4 Optimal Frequency Offsets with Doppler Spreads in Mobile OFDM System**
Ting-Li Liu, National Taiwan University, Taiwan; Wei-Ho Chung, Academia Sinica, Taiwan; Hongke Zhang, Beijing Jiaotong University, China; Chung-Hsiu Chung, Institute for Information Industry, Taiwan; Chih-Hsiang Ho, Institute for Information Industry, Taiwan; and Sy-Yen Kuo, National Taiwan University, Taiwan

**5 Analytical Performance Evaluation of an Efficient Reduced-Complexity Time Synchronization Approach for OFDM Systems**
Leila Nasraoui, Higher School of Communications, Tunisia; Leila Najjar Atallah, Higher School of Communications, Tunisia; and Mohamed Siala, Higher School of Communications, Tunisia

***Tuesday 4 September 2012 14:00-15:30 207***

## 2B: Resource Allocation for Multiple Access

**1 Discrete Power Allocation via Ant Colony Optimization for Multi-cell OFDM Systems**
Da Wang, Beijing University of Posts and Telecommunications, China; Xiaodong Xu, Beijing University of Posts and Telecommunications, China; Xin Chen, Beijing University of Posts and Telecommunications, China; Xiaofeng Tao, Beijing University of Posts and Telecommunications, China; Yue Yin, Beijing University of Posts and Telecommunications, China; and Harald Haas, The University of Edinburgh, United Kingdom

**2 System Performance of Inter-NodeB MF-HSDPA with Enhancements to Backhaul Flow/Congestion Control**
Weiyan Ge, Qualcomm Inc, United States; Rohit Kapoor, Qualcomm Inc, United States; Danlu Zhang, Qualcomm Inc, United States; Sharad Sambhwani, Qualcomm Inc, United States; and Mario Scipione, Qualcomm Inc, United States

3 **An adaptive backoff algorithm for OFDMA systems**
Yao Huang, Hui Tian, Cheng Qin, Jinghong Li and Jun Zhang, Beijing University of Posts and Telecommunications, China

4 **Efficient and Fair Resource Allocation Scheme for OFDMA Networks Based on Auction Game**
Seyed Mohamad Alavi, Illinois Institute of Technology, United States; Chi Zhou, Illinois Institute of Technology, United States; and Wan Wang Gen, Shanghai University, China

5 **DFT-OQAMA: An Alternative Multiple Access for Future Mobile Networks**
Mohamed Gharba, France Telecom, France; Hao Lin, France Telecom, France; Pierre Siohan, France Telecom, France; and Fabrice Labeau, McGill University, Canada

***Tuesday 4 September 2012 14:00-15:30 2105***

## 2C: Network Coding

1 **Performance Evaluation of TDMA Based Wireless Network Coding Prototype System**
Nobuaki Otsuki, NTT, Japan; and Takatoshi Sugiyama, NTT, Japan

2 **A Multiple-MAC-Based Protocol to Identify Misbehaving Nodes in Network Coding**
Juan Camilo Corena, Keio University, Japan; and Tomoaki Ohtsuki, Keio University, Japan

3 **Throughput Adaptation and Traffic Ratio Control in Cooperative Relay Networks with Network Coding and Asymmetric Traffic**
Lin Shan, Kyoto University, Japan; Sonia Aissa, University of Quebec, Canada; Hidekazu Murata, Kyoto University, Japan; and Susumu Yoshida, Kyoto University, Japan

4 **Reliable Communication in Wireless Meshed Networks using Network Coding**
Peyman Pahlevani, Aalborg University, Denmark; Achuthan Paramanathan, Aalborg University, Denmark; Martin Hundebøll, Aalborg University, Denmark; Janus Heide, Aalborg University, Denmark; Stephan A. Rein, Aalborg University, Denmark; and Frank H.P. Fitzek, Aalborg University, Denmark

5 **How Network Coding Benefits Converge-Cast inWireless Sensor Networks**
Zhenzhou Tang, Wenzhou University, China; Hongyu Wang, Dalian University of Technology, China; Qian Hu, Wenzhou University, China; and Long Hai, Dalian University of Technology, China

***Tuesday 4 September 2012 14:00-15:30 2101***

## 2D: Detection and Estiation II

1 **Joint Symbol Timing and Channel Estimation in Two-Way Multiple Antenna Relay Networks**
Zhe Jiang, Northwestern Polytechnical University, China; Haiyan Wang, Northwestern Polytechnical University, China; and Zhi Ding, University of California, Davis, United States

2 **Derivation of Log-Likelihood Ratio for M-ary Non-Orthogonal FSK Wireless System**
Daisuke Nojima, Kyushu Institute of Technology, Japan; Yuhei Nagao, Kyushu Institute of Technology, Japan; Masayuki Kurosaki, Kyushu Institute of Technology, Japan; and Hiroshi Ochi, Kyushu Institute of Technology, Japan

3 **Time Delays Estimation from DS-CDMA MultipathTransmissions using Expectation Maximization**
Ahmed Masmoudi, INRS-EMT, Canada; Faouzi Billili, INRS-EMT, Canada; and Sofiène Affes, INRS-EMT, Canada

4 **Linear Unbiased Channel Estimation and Data Detection in Superimposed OFDM Systems**
Malihe Ahmadi, University of Alberta, Canada; Majid Ghanbarinejad, University of Alberta, Canada; and Aryan Saadat Mehr, University of Saskatchewan, Canada

5 **Give and Take: Characterization of Availability of Multi-State Wireless Backhaul Networks**
Daniel Philip Venmani, Orange Labs, France Telecom R&D, France; Yvon Gourhant, Orange Labs, France Telecom R&D, France; and Djamal Zeghlache, TELECOM SudParis, France

***Tuesday 4 September 2012 14:00-15:30 206B***

## 2E: Vehicular Communications and Networking

1 **Field Measurements of IEEE 802.11p Communication in NLOS Environments for a Platooning Application**
Kristian Karlsson, SP Technical Research Institute of Sweden, Sweden; Carl Bergenhem, SP Technical Research Institute of Sweden, Sweden; and Erik Hedin, Hedin Global Corporation, Sweden

2 **VCAST: An infrastructure-less vehicular traffic information service with distance-sensitive precision**
Vinod Kulathumani, West Virginia University, United States; and Yaser Fallah, West Virginia University, United States

3 **Traffic differentiation - a basic step towards providing end-to-end QoS on the train-to-wayside wireless communication system**
Milos Rovcanin, IBBT - Ghent University, Belgium; Dries Naudts, IBBT - Ghent University, Belgium; Daan Pareit, IBBT - Ghent University, Belgium; Ingrid Moerman, IBBT - Ghent University, Belgium; Erwin Van de Velde, PATS - University of Antwerp, Belgium; Johan Bergs, PATS - University of Antwerp, Belgium; and Chris Blondia, PATS - University of Antwerp, Belgium

4 **Virtual Virtual Circuits: One Step Beyond Virtual Mobile Nodes in Vehicular Ad-hoc Networks**
Jack Fernando Bravo-Torres, Salesian Polytechnic University, Ecuador; Martín López-Nores, University of Vigo, Spain; Yolanda Blanco-Fernández, University of Vigo, Spain; and José Juan Pazos-Arias, University of Vigo, Spain

***Tuesday 4 September 2012 14:00-15:30 2104A***

## 2F: Decode and Forward I

1 **Design of Hierarchical Modulation for Wireless Relay Networks**
Tung Pham, University of Saskatchewan, Canada; and Ha Nguyen, University of Saskatchewan, Canada

2 **Performance Analysis of Centralized Relay Selection with Unreliable Control Information**
Agisilaos Papadogiannis, Chalmers University of Technology, Sweden; and Tommy Svensson, Chalmers University of Technology, Sweden

3 **Improved Iterative Decoders for Turbo-Coded Decode-and-Forward Relay Channels**
Khoa Q. Huynh, Chalmers University of Technology, Sweden; and Tor Aulin, Chalmers University of Technology, Sweden

4 **Performance Analysis of Decode and Forward Incremental Relaying in the Presence of Multiple Sources of Interference**
Ala Abu Alkheir, Queen's University, Canada; and Mohamed Ibnkahla, Queen's University, Canada

5 **A Trellis Coded Modulation Scheme for the Fading Relay Channel**
Vijayvaradharaj T Muralidharan, Indian Institute of Science, India; and B Sundar Rajan, Indian Institute of Science, India

***Tuesday 4 September 2012 14:00-15:30 208AB***

## 2G: Network Deployment Aspects

1 **Optimising Femtocell Placement in an Interference Limited Network: Theory and Simulation**
Siyi Wang, The University of Sheffield, United Kingdom; Weisi Guo, The University of Sheffield, United Kingdom; and Tim O'Farrell, The University of Sheffield, United Kingdom

**2 Voronoi-Based ISD and Site Density Characteristics for Mobile Networks**
Anders Landström, Luleå University of Technology, Sweden; Arne Simonsson, Ericsson Research, Sweden; and Håkan Jonsson, Luleå University of Technology, Sweden

**3 Interference Aware Positioning of Aerial Relays for Cell Overload and Outage Compensation**
Sebastian Rohde, TU Dortmund University, Germany; and Christian Wietfeld, TU Dortmund University, Germany

**4 On Small Cell Network Deployment: A Comparative Study of Random and Grid Topologies**
Chung Shue Chen, Alcatel-Lucent Bell Labs, France; Van Minh Nguyen, Sequans Communications, France; and Laurent Thomas, Alcatel-Lucent Bell Labs, France

**5 Realistic Indoor Wi-Fi and Femto Deployment Study as the Offloading Solution to LTE Macro Networks**
Liang HU, Aalborg University, Denmark; Claudio Coletti, Aalborg University, Denmark; Nguyen Huan, Aalborg University, Denmark; István Kovács, NSN, Denmark; Benny Vejlgaard, NSN, Denmark; Ralf Irmer, Vodafone Group R&D, United Kingdom; and Neil Scully, Vodafone Group R&D, United Kingdom

***Tuesday 4 September 2012 14:00-15:30 2000C***

## 2P: Antennas and Signal Processing Posters

**1 Distance-Dependent Model of Ricean K-Factors in High-Speed Rail Viaduct Channel**
Ruisi He, Beijing Jiaotong University, China; Zhangdui Zhong, Beijing Jiaotong University, China; Bo Ai, Beijing Jiaotong University, China; and Jianwen Ding, Beijing Jiaotong University, China

**2 Correlation Evaluation on Small LTE Handsets**
Samantha Caporal Del Barrio, Aalborg Universitet, Denmark; and Gert F. Pedersen, Aalborg Universitet, Denmark

**3 Rayleigh Scattering Cluster Based Spatial-Temporal-Spectral Correlation Properties with MIMO-OFDM Channel Model**
Xin Li, NTNU, Norway; and Torbjorn Ekman, NTNU, Norway

**4 Channel Feasibility for Outdoor Non-Line-of-Sight mmWave Mobile Communication**
Sridhar Rajagopal, Samsung Electronics, United States; Shadi Abu-Surra, Samsung Electronics, United States; and Mehrzad Malmirchegini, University of New Mexico, United States

**5 Small-Cell Wireless Backhauling - A Non-Line-of-Sight Approach for Point-to-Point Microwave Links**
Mikael Coldrey, Ericsson Research, Ericsson AB, Sweden; Havish Koorapaty, Ericsson Research, Ericsson Inc, United States; Jan-Erik Berg, Ericsson Research, Ericsson AB, Sweden; Zere Ghebretensaé, Ericsson Research, Ericsson AB, Sweden; Jonas Hansryd, Ericsson Research, Ericsson AB, Sweden; Anders Derneryd, Ericsson Research, Ericsson AB, Sweden; and Sorour Falahati, Ericsson Research, Ericsson AB, Sweden

**6 Performance Evaluation of Beamformed Spatial Multiplexing Transmission in Millimeter-Wave Communication Channels**
Seung Joon Lee, Kangwon National University, South Korea; Wooyong Lee, ETRI, South Korea; Seung-Eun Hong, ETRI, South Korea; and Jinkeong Kim, ETRI, South Korea

**7 Analysis of the Multi-cell Correlation of the Slow Fading from UMTS Measurements and its Impact on Radio Network Planning**
Juergen Beyer and Linghan Mao, Deutsche Telekom Technik, Germany

**8 Channel Prediction for Link Adaptation in LTE Uplink**
Henrik Sahlin, Ericsson, Sweden

**9 High Power Amplifier Linearization using Zernike Polynomials in a LTE Transmission**
Leticia Aladren, University of Zaragoza, Spain; Paloma Garcia-Ducar, University of Zaragoza, Spain; Pedro Luis Carro, University of Zaragoza, Spain; Jesus de Mingo, University of Zaragoza, Spain; and Cesar Sanchez-Perez, University of Zaragoza, Spain

**10 Measurement Verification of Plane Wave Synthesis Technique Based on Multi-probe MIMO-OTA Setup**
Wei Fan, Aalborg university, Denmark; Xavier Carreño, Intel Mobile Communications, Denmark; Mikael B. Knudsen, Intel Mobile Communications, Denmark; Gert Pedersen, Aalborg university, Denmark; Jesper Ø. Nielsen, Aalborg university, Denmark; and Kim Olesen, Aalborg university, Denmark

**11 Non-Line-Of-Sight 2.6GHz Relay Backhaul Channel Performance: Field Test and Analysis**
Yu Qian, Ericsson Research, China; Henrik Asplund, Ericsson Research, Sweden; Jan-Erik Berg, Ericsson Research, Sweden; and Zhiheng Guo, Ericsson Research, China

**12 Comparison of Quasi-Simultaneous Outdoor-to-Indoor Propagation Loss and Delay Dispersion Measurements at 150, 450, and 700 MHz.**
Robert Bultitude, Communications Research Centre, Canada; Tyler Smith, Communications Research Centre, Canada; Dino Cule, Communications Research Centre, Canada; and Hong Zhu, Communications Research Centre, Canada

**13 A Geometrical-based Vertical Gain Correction for Signal Strength Prediction of Downtilted Base Station Antennas in Urban Areas**
Ignacio Rodriguez, Aalborg University, Denmark; Huan C. Nguyen, Aalborg University, Denmark; Troels B. Sørensen, Aalborg University, Denmark; Jan Elling, Telenor DK, Denmark; Morten B. Gentsch, Telenor DK, Denmark; Mads Sørensen, Telenor DK, Denmark; Lauri Kuru, Nokia Siemens Networks, Finland; and Preben Mogensen, Nokia Siemens Networks, Denmark

**14 Dual-Adaptive Linear Prediction for Radio Channel with Abrupt Change**
Changwei Lv, Beijing Institute of Technology, China; Shujuan Hou, Beijing Institute of Technology, China; and Wenbo Mei, Beijing Institute of Technology, China

**15 Quarter-Omni: Improving Coverage and Throughput through Partial Directional Communication in IEEE 802.11p WAVE**
Sungheon Lim, Korea University, Korea, Republic of; and Hyogon Kim, Korea University, Korea, Republic of

**16 The Evaluation of CQI Delay Compensation Schemes Based on Jakes Model and ITU Scenarios**
Huiling Dai, Beijing University of Posts & Telecommunications Wireless Technology Innovation Institute, China; Ying Wang, Beijing University of Posts & Telecommunications Wireless Technology Innovation Institute, China; Cong Shi, Beijing University of Posts & Telecommunications Wireless Technology Innovation Institute, China; and Weidong Zhang, Beijing University of Posts & Telecommunications Wireless Technology Innovation Institute, China

**17 Studying the Impact of the CORNER Propagation Model on VANET Routing in Urban Environments**
Abhinay Mukunthan, University of Wollongong, Australia; Craig Cooper, University of Wollongong, Australia; Farzad Safaei, University of Wollongong, Australia; Daniel Franklin, University of Technology, Sydney, Australia; and Mehran Abolhasan, University of Technology, Sydney, Australia

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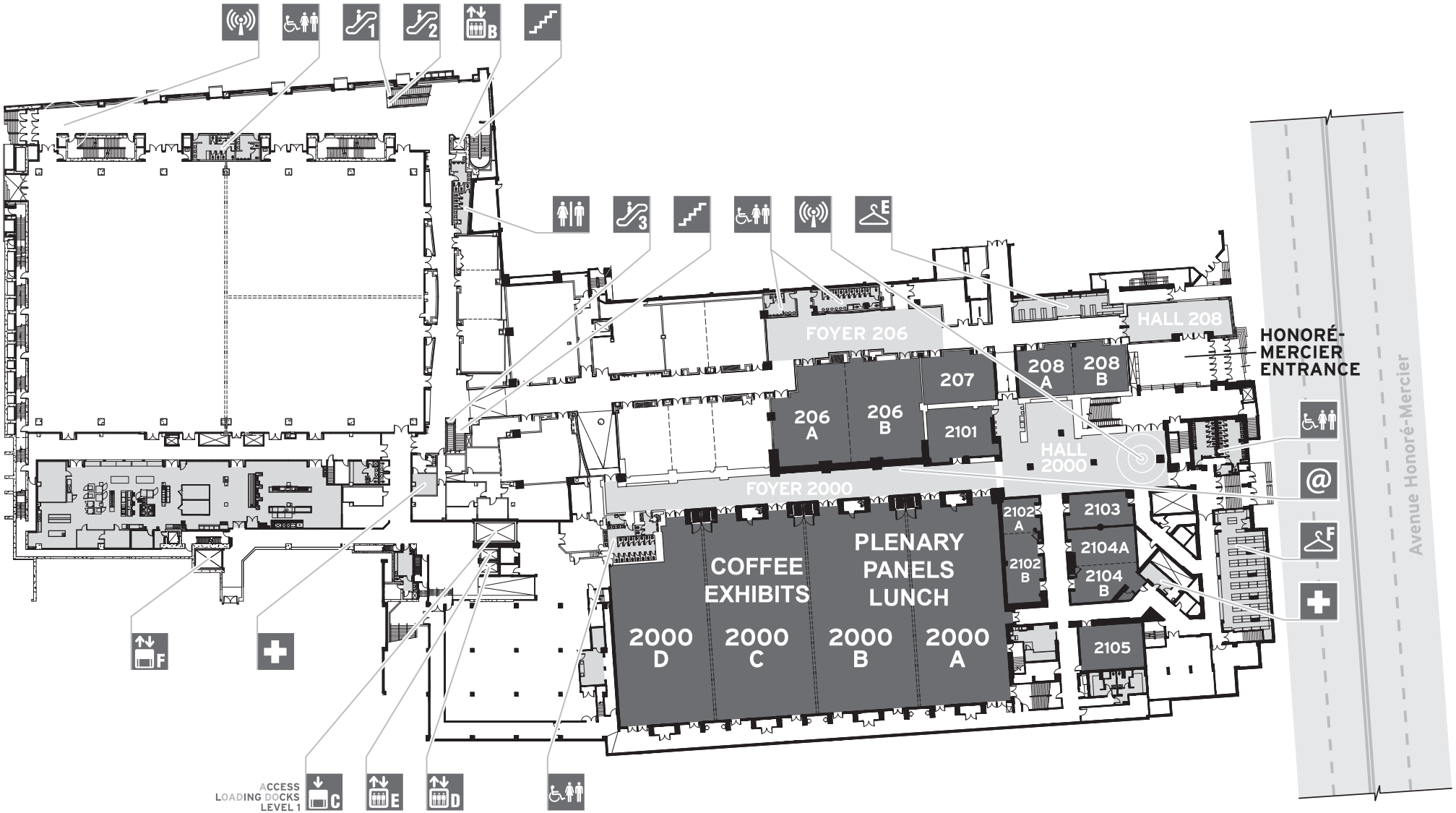
|---|---|---|---|---|---|---|---|---|---|---|
| **MONDAY 3 September** | | | | | | | | | | |
| 7:30-17:30 | | Registration (2000 Foyer Entrance) | | | | | | | | |
| 9:00-17:00 | | Tutorials & W2: See separate program above | | | | | | | | |
| 19:00-21:00 | | VTC Welcome Reception (Observatoire de la Capitale) | | | | | | | | |
| **TUESDAY 4 September** | | | | | | | | | | |
| 7:30-17:30 | | Registration (2000 Foyer Entrance) | | | | | | | | |
| 8:30-10:30 | | Opening Plenary: Jean Luc Bérubé, President, Communications Research Center Canada (2000AB) | | | | | | | | |
| 10:30-11:00 | | Coffee (2000C) | | | | | | | | |
| 11:00-12:30 | (1) | Localization and Tracking | Network Topology | Dynamic Spectrum Access | Precoding for Cooperation | Femto I | Detection and Estimation I | Mobility and Vehicle Traffic Models | | Communications Posters |
| 12:30-14:00 | | Lunch (2000AB) | | | | | | | Workshop starts 13:30 | |
| 14:00-15:30 | (2) | CFO and Synchronization | Resource Allocation for Multiple Access | Network Coding | Detection and Estimation II | Vehicular Communications and Networking | Decode and Forward I | Network Deployment Aspects | Workshop on Wireless World 2020 Invited Talks | Antennas and Signal Processing Posters |
| 15:30-16:00 | | Coffee and Exhibits (2000C) | | | | | | | | |
| 16:00-17:50 | (3) | Routing in Ad Hoc Networks | Antenna Design and Characterization | Cognitive Radio Networks | Two-way Relaying | Wi-Fi | Precoding | Vehicular Applications | Workshop on Wireless World 2020 Papers | Applications and Transportation posters |
| 18:00-19:30 | | Panel: A Glimpse Beyond the Wireless Horizon (2000AB, light snacks provided) | | | | | | | | |
| **WEDNESDAY 5 September** | | | | | | | | | | |
| 7:30-17:30 | | Registration (2000 Foyer Entrance) | | | | | | | | |
| 8:30-10:30 | | Plenary: Ted Rappaport, NYU-Poly; Reinaldo Valenzuela, Bell Labs, Alcatel-Lucent (2000AB) | | | | | | | | |
| 10:30-11:00 | | Coffee and Exhibits (2000C) | | | | | | | | |
| 11:00-12:30 | (4) | Decode and Forward II | HetNet I | LTE | FEC | Energy Efficiency I | Beamforming and Antenna Selection | Industrial Sessions: Interdigital | CAPS2012: Context-aware Proactive Systems | Multiple Antennas Posters |
| 12:30-14:00 | | Lunch (2000AB) | | | | | | | | |
| 14:00-15:30 | (5) | Source and Channel Coding | Interference Alignment and Cancellation | Energy Efficiency II | MA System Performance Evaluation | Positioning Systems I | LTE Networks | Industrial Sessions: Nutaq | CAPS2012: Context-aware Vehicular Applications | Transmission Technologies Posters |
| 15:30-16:00 | | Coffee and Exhibits (2000C) | | | | | | | | |
| 16:00-17:00 | (6) | Impulsive Noise | Mobile Satellite Systems | Cognitive Radio Protocols and Algorithms | Cooperative Sensing | Coexistence of Multiple Radio Access Techologies | DVB and DAB Techniques | Industrial Sessions: Agilent Technologies | | |
| 17:10-18:30 | | Panel: The Myths and Realities of "Green" Wireless (2000AB) | | | | | | | | |
| 19:00-22:00 | | VTC2012-Fall Banquet (Capitole Theatre) | | | | | | | | |
| **THURSDAY 6 September** | | | | | | | | | | |
| 7:30-15:00 | | Registration (2000 Foyer Entrance) | | | | | | | | |
| 9:00-10:00 | | Plenary: Muriel Médard, MIT | | | | | | | | |
| 10:00-10:30 | | Coffee and Exhibits (2000C) | | | | | | | | |
| 10:30-12:30 | (7) | Limited Feedback | Amplify and Forward | MIMO/OFDM-based Cognitive Radio | Channel Estimation | VANETs | Spectrum Sensing | Cooperation with Limited Feedback | | Networks Posters |
| 12:30-14:00 | | Lunch (2000AB) | | | | | | | | |
| 14:00-15:30 | (8) | HetNet II | Channel Characterization and Modeling | WSN Design and Deployment | Cooperation in LTE | Intelligent Transportation Systems | Space-time Coding | Energy Efficiency | | Multiple Access Posters |
| 15:30-16:00 | | Coffee (2000C) | | | | | | | | |
| 16:00-17:30 | (9) | Femto II | PHY/MAC for Ad Hoc Networks | Equalization | OFDM | Power Control I | Modulation and Detection | Power Allocation | | Cooperative Communications Posters |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**18 A New Upper Bound for the Normalized Detection Threshold of the FFT-Based Summation Detector**
Sichun Wang, Defence R&D Canada-Ottawa, Canada; Francois Patenaude, Communications Research Centre, Canada; and Robert Inkol, Defence R&D Canada-Ottawa, Canada

**19 Spectrum Sharing in Cognitive Radio Systems: Ergodic and Outage Capacities**
Vahid Asghari, INRS-EMT, University of Quebec, Canada; and Sonia Aissa, INRS-EMT, University of Quebec, Canada

**20 Power Amplifier Behavioral Modeling by NeuralNetworks and their Implementation on FPGA**
Roger Sandrin Ntouné Ntouné, Mohammed Bahoura and Chan-Wang Park, Université du Québec à Rimouski, Canada

**21 RSS-based Node Localization in the Existence of Moving Obstructions**
Yun Zhou, Guang Zhao, Bo Yang, Aidong Men and Qingchao Chen, Beijing University of Posts and Telecommunications, China

**22 Automatic Modulation Classification using Information Theoretic Similarity Measures**
Aluisio I. R. Fontes, Universidade Federal do Rio Grande do Norte (UFRN), Brazil; Fuad M. Abinader Jr., Instituto Nokia de Tecnologia (INdT), Brazil; Leandro A. Pasa, Universidade Federal do Rio Grande do Norte (UFRN), Brazil; Vicente A. Sousa Jr., Universidade Federal do Rio Grande do Norte (UFRN), Brazil; Luiz F. Q. Silveira, Universidade Federal do Rio Grande do Norte (UFRN), Brazil; and José A. F. Costa, Universidade Federal do Rio Grande do Norte (UFRN), Brazil

**23 Spectral Estimation-based OFDM Radar Algorithms for IEEE 802.11a Signals**
Martin Braun, Karlsruhe Institute of Technology, Germany; Manuel Fuhr, Karlsruhe Institute of Technology, Germany; and Friedrich Jondral, Karlsruhe Institute of Technology, Germany

**24 Low Complexity Beamforming Methods for MIMO-OFDM Systems**
Farhad Tavassoli, Illinois Institute of Technology, United States; and chi Zhou, Illinois Institute of Technology, United States

**25 Joint TX/RX IQ Mismatch Compensation Based on a Low-IF Internal Feedback Architecture**
Chun-Hsien Peng, Mediatek inc., Taiwan; Paul Liang, Mediatek inc., Taiwan; Charles Chien, Mediatek inc., United States; Bala Narasimhan, Mediatek inc., United States; and HC Hwang, Mediatek inc., Taiwan

**26 Robust Power Allocation for Selective Relaying Based DF Cellular Wireless System**
Shankhanaad Mallick, University of British Columbia, Canada; Rajiv Devarajan, University of British Columbia, Canada; Mohammad M. Rashid, University of British Columbia, Canada; and Vijay K. Bhargava, University of British Columbia, Canada

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*Tuesday 4 September 2012 16:00-17:50 2103*

## 3A: Routing in Ad Hoc Networks

**1 An efficient metric for reliable routing with link dependencies**
Amadou Baba Bagayoko, University of Toulouse, IRIT Laboratory ENSEEIHT, France; Riadh Dhaou, University of Toulouse, IRIT Laboratory ENSEEIHT, France; and Beatrice Paillassa, University of Toulouse, IRIT Laboratory ENSEEIHT, France

**2 A Framework for Simulation Analysis of Delay Tolerant Routing Protocols**
Sathya Narayanan, California State University, Monterey Bay, United States; Eric McDonald, California State University, Monterey Bay, United States; and Geoffrey Xie, Naval Postgraduate School, United States

**3 LOADng: Towards AODV Version 2**
Thomas Clausen, LIX, Ecole Polytechnique, France; Jiazi Yi, LIX, Ecole Polytechnique, France; and Axel Colin de Verdiere, LIX, Ecole Polytechnique, France

**4 Distributed Load Balancing Mechanism for Detouring Routing Holes in Sensor Networks**
Jinnan Gao, Beijing Institute of Technology, China; Fan Li, Beijing Institute of Technology, China; and Yu Wang, University of North Carolina at Charlotte, United States

**5 Social-Aware Routing for Wireless Mesh Networks**
Shadi Basurra, University of Bath, United Kingdom; Yusheng Ji, National Institute of Informatics (NII), Japan; Marina De Vos, University of Bath, United Kingdom; Julian Padget, University of Bath, United Kingdom; Tim Lewis, Toshiba Research Europe Ltd, United Kingdom; and Simon Armour, Bristol University, United Kingdom

**6 TIEGeR: An Energy-Efficient Multi-Parameter Geographic Routing Algorithm**
Ishaan Bir Singh, McGill University, Canada; Tho Le-Ngoc, McGill University, Canada; and Quang Dung Ho, McGill University, Canada

*Tuesday 4 September 2012 16:00-17:50 207*

## 3B: Antenna Design and Characterization

**1 Investigation of Loop and Whip Antennas in Tire Pressure Monitoring Systems**
Hua Zeng, Hitachi Automotive Systems Americas, Inc., United States; and Todd Hubing, Clemson University, United States

**2 UE Calibration in MIMO Systems**
Afshin Haghighat, InterDigital Communications LLC, Canada

**3 LTE Radiated Data Throughput Measurements, Adopting MIMO 2x2 Reference Antennas**
Istvan Szini, Motorola Mobility Inc., United States; Gert F. Pedersen, Aalborg Universitet, Denmark; Samantha Caporal Del Barrio, Aalborg Universitet, Denmark; and Michael D. Foegelle, ETS-Lindgren, L. P., United States

**4 Challenges for Frequency-Reconfigurable Antennas in Small Terminals**
Samantha Caporal Del Barrio, Aalborg Universitet, Denmark; Mauro Pelosi, Aalborg Universitet, Denmark; Gert F. Pedersen, Aalborg Universitet, Denmark; and Art Morris, Wispry Inc., United States

*Tuesday 4 September 2012 16:00-17:50 2105*

## 3C: Cognitive Radio Networks

**1 An Architecture for Cognitive Radio Networks with Cognition, Self-organization and Reconfiguration Capabilities**
Ding Xu, Qixun Zhang, Yang Liu, Ying Xu and Ping Zhang, Key Laboratory of Universal Wireless Communications, Ministry of Education, Beijing University of Posts and Telecommunications, Beijing, P.R. China., China

**2 Downlink Resource Management Based on Cross-Cognition and Graph Coloring in Cognitive Radio Femtocell Networks**
Pan Hu, Jin Ye, Fan Zhang, Sumin Deng, Chaowei Wang and Weidong Wang, Beijing University of Posts and Telecommunications, China

**3 Outage Probability Analysis of Cognitive Relay Networks in Nakagami-m Fading Channels**
Yifan Zhang, Yin Xie, Yang Liu, Zhiyong Feng, Ping Zhang and Zhiqing Wei, Beijing University of Posts and Telecommunications, China

**4 Outage Performance of Cognitive Relay Networks with Primary Users ISR Constraint**
Zhiqing Wei, Beijing University of PostsTelecommunications, China; Yin Xie, Beijing University of PostsTelecommunications, China; Rong Li, Beijing University of PostsTelecommunications, China; and Qixun Zhang, Beijing University of Posts and Telecommunications, China

**5 Channel Selection Statistics for Control Information Sharing within Cognitive Radio Networks**
Mai Ohta, The University of Electro-Communications, Japan; Takamasa Kimura, The University of Electro-Communications, Japan; Hasan Rajib Imam, The University of Electro-Communications, Japan; Sean Rocke, Worcester Polytechnic Institute, United States; Jingkai Su, Worcester Polytechnic Institute, United States; Alexander M. Wyglinski, Worcester Polytechnic Institute, United States; and Takeo Fujii, The University of Electro-Communications, Japan

**6 Outage Constrained Power Allocation and Relay Selection for Multi-Hop Cognitive Network**
Ying Wang, Zhiyong Feng, Xin Chen, Rong Li and Ping Zhang, Beijing University of Posts and Telecommunications, China

***Tuesday 4 September 2012 16:00-17:50 2101***

## 3D: Two-way Relaying

**1 MIMO Two-Way Relaying: A Comparison of Beamforming and Antenna Selection**
Nan Yang, CSIRO ICT Centre, Australia; Phee Lep Yeoh, University of Melbourne, Australia; Maged Elkashlan, Queen Mary, University of London, United Kingdom; and Iain B. Collings, CSIRO ICT Centre, Australia

**2 An SINR Balancing Technique for a Cognitive Two-Way Relay Network**
Georgia Bournaka, Advanced Signal Processing Group, United Kingdom; Kanapathippillai Cumanan, Advanced Signal Processing Group, United Kingdom; Sangarapillai Lambotharan, Advanced Signal Processing Group, United Kingdom; and Fotis Lazarakis, Institute of Informatics and Telecommunications, Greece

**3 Minimizing Sum Power in Two-Way Amplify-and-Forward Relay Channel Based on Instantaneous Channel State Information**
Ebru Sinem Çetin, Istanbul Technical University, Turkey; and Mehmet Ertuğrul Çelebi, Istanbul Technical University, Turkey

**4 Diversity Analysis of Minimum Distance Based Relay Selection Schemes for Two-way Relaying Systems with Physical Network Coding**
Youngil Jeon, Electronics and Telecommunications Research Institute (ETRI), South Korea; Young-Tae Kim, Korea University, South Korea; Changick Song, Korea University, South Korea; Youn-Ok Park, Electronics and Telecommunications Research Institute (ETRI), South Korea; and Inkyu Lee, Korea University, South Korea

**5 Receiver Design for Variable Gain Amplify-Forward Two-Way Relay with Channel Estimation Errors**
Wei Bao, Beijing University of PostsTelecommunications, China; Jianhua Zhang, Beijing University of PostsTelecommunications, China; and Ping Zhang, Beijing University of Posts and Telecommunications, China

**6 Wireless Network-Coded Accumulate-Compute and Forward Two-Way Relaying**
Srishti Shukla, Indian Institute of Science, Bangalore 560012, India; Vijayvaradharaj T Muralidharan, Indian Institute of Science, Bangalore 560012, India; and B Sundar Rajan, Indian Institute of Science, Bangalore 560012, India

***Tuesday 4 September 2012 16:00-17:50 206B***

## 3E: Wi-Fi

**1 Throughput Modeling of Differentiation Schemes for IEEE 802.11e MAC Protocol**
Fei Peng, University of British Columbia, Canada; Kaveh Shafiee, University of British Columbia, Canada; and Victor C.M. Leung, University of British Columbia, Canada

**2 Power Savings and Performance Analysis in Wireless Networks**
Mohammed Boulmalf, International University of Rabat, Morocco

**3 An Advanced Semi-Markov Process Model for Performance Analysis of Wireless LANs**
Hao Wang, Guixia Kang and Kai Huang, Beijing University of Posts and Telecommunications, China

**4 Enabling Network Based Local Mobility With Cooperative Access Points**
Yang Xia, Nanyang Technological University, Singapore; and Chai Kiat Yeo, Nanyang Technological University, Singapore

**5 The Impact of Packet Loss Behavior in 802.11g on the Cooperation Gain in Reliable Multicast.**
Janus Heide, Aalborg University, Denmark; Peter Vingelman, Budapest University of TechnologyEconomics, Hungary; Morten V. Pedersen, Aalborg University, Denmark; Qi Zhang, Aarhus University, Denmark; and Frank H.P. Fitzek, Aalborg University, Denmark

**6 Throughput and Delay Analysis of a QoS Differentiated p-persistent CSMA Protocol with Multirate**
Salim Abukharis, University of Sheffiled, United Kingdom; and Tim O'Farrell, University of Sheffiled, United Kingdom

***Tuesday 4 September 2012 16:00-17:50 2104A***

## 3F: Precoding

**1 LTE-Advanced Multi-User MIMO: Improved Feedback and Precoding Design**
Rizwan Ghaffar, National University of Sciences and Technology, Pakistan

**2 Modified Tomlinson Harashima Precoding Using Square Root for Multi-User MIMO Systems**
Shogo Fujita, Kyushu Institute of Technology, Japan; Leonardo Jr Lanante, Kyushu Institute of Technology, Philippines; Yuhei Nagao, Kyushu Institute of Technology, Japan; Masayuki Kurosaki, Kyushu Institute of Technology, Japan; and Hiroshi Ochi, Kyushu Institute of Technology, Japan

**3 One-sided Precoder Designs for Interference Alignment**
Chen Zhang, Huarui Yin and Guo Wei, University of Science and Technology of China, China

**4 Block Diagonal Inversion Precoding for MIMO Broadcast Channels**
Bruhtesfa Godana, Torbjorn Ekman and Solomon Tesfamicael, Norwegian University of Science and Technology, Norway

**5 Modified Tomlinson-Harashima Precoding for Downlink MU-MIMO Channel with Arbitrary Precoder**
Hamid Farmanbar, Huawei, Canada; and Hadi Baligh, Huawei, Canada

***Tuesday 4 September 2012 16:00-17:50 208AB***

## 3G: Transportation Applications

**1 Tomorrow's In-Car Interconnect? A Competitive Evaluation of IEEE 802.1 AVB and Time-Triggered Ethernet (AS6802)**
Till Steinbach, Hamburg University of Applied Sciences, Germany; Hyung-Taek Lim, BMW Group Research and Technology, Germany; Franz Korf, Hamburg University of Applied Sciences, Germany; Thomas C. Schmidt, Hamburg University of Applied Sciences, Germany; Daniel Herrscher, BMW Group Research and Technology, Germany; and Adam Wolisz, Technische Universität Berlin, Germany

**2 Bit Error Rate Analysis in WiMAX Communication at Vehicular Speeds Using Nakagami-m Fading Model**
Biswojit Bose, ECU, Australia; Iftekhar Ahmad, ECU, Australia; and Daryoush Habibi, ECU, Australia

**3 Location Based Data Delivery Schedulers for Vehicle Telematics Applications**
Ke Xu, Clemson University, United States; Philip Orlik, Mitsubishi Electric Research Laboratories, United States; Yukimasa Nagai, Mitsubishi Electric Corporation, Japan; and Masashi Saito, Mitsubishi Electric Corporation, Japan

**4 Using of beaconing for robust video transmission in overtaking assistance applications**
Alexey Vinel, Tampere University of Technology, Finland; Evgeny Belyaev, Tampere University of Technology, Finland; and Yevgeni Koucheryavy, Tampere University of Technology, Finland

**5 Adjacent Vehicle Collision Avoidance Protocol in Mitigating the Probability of Adjacent Vehicle Collision**
Muhammad Adeel, University of EngineeringTechnology Peshawar, Pakistan; Sahibzada Ali Mahmud, University of EngineeringTechnology Peshawar, Pakistan; and Gul Muhammad Khan, University of Engineering and Technology Peshawar, Pakistan

**6 Cars as Roadside Units: A Cooperative Solution**
Wantanee Viriyasitavat, Carnegie Mellon University, United States; and Ozan Tonguz, Carnegie Mellon University, United States

***Tuesday 4 September 2012 16:00-17:50 2000C***

## 3P: Wireless Applications and Transportation Posters

**1 Using Vehicular Sensor Networks for Mobile Surveillance**
Kun-Chan Lan, National Cheng Kung University, Taiwan; Chien-Ming Chou, National Cheng Kung University, Taiwan; and Han-Yi Wang, National Cheng Kung University, Taiwan

**2 Cost-Effective and Feasible Handoff Application for Mobile Phones**
Maike Kuhnert, TU Dortmund University, Germany; Thang Tran, TU Dortmund University, Germany; and Christian Wietfeld, TU Dortmund University, Germany

**3 A Low-Power Multi-Radio Wireless Network for MobileAsset Tracking**
Richard Farley, Qualcomm Inc., United States; Gang Ding, Qualcomm Inc., United States; and Dilip Krishnaswamy, Qualcomm Inc., United States

**4 A Method of Increasing Data Rate for Human Body Communication System for Body Area Network Applications**
Taewook Kang, Ingi Lim, Junghwan Hwang, Changhee Hyoung, Hyungil Park and Sungweon Kang, Electronics and Telecommunications Research Institute (ETRI), Korea, Republic of

**5 An Extensible Distributed Measurement Platform for Analyzing Quality-of-Experience (QoE) of Multimedia Applications over Wireless Networks**
Ying Wai Wong, Wing Cheong Lau, Kin Ming Chan, Yichen Yang, Chun Yu Tang, Fung Lam and Kin Man Lo, The Chinese University of Hong Kong, Hong Kong

**6 A Trust Distribution Service for MANETs**
Humphrey Rutagemwa and David Kidston, Communications Research Centre (CRC), Canada

**7 Robust RFID Authentication for Supply Chain Management**
Binod Vaidya, University of Ottawa, Canada; Dimitrios Makrakis, University of Ottawa, Canada; and Hussein T. Mouftah, University of Ottawa, Canada

**8 Stochastic Optimal SIM Selection for Multi-SIMCell-phone Architecture using semi-MarkovDecision Processes**
Muhammad Murtaza, Muhammad Qudoos and Muhammad Tahir, University of Eng. and Tech. Lahore, Pakistan

**9 A Novel Fast Tag Estimate Method for Dynamic Frame Length Aloha Anti-collision Algorithms in RFID System**
Shuai Wang, Beijing University of Posts and Telecommunications, China; Weijun Hong, Beijing University of Posts and Telecommunications, China; Liang Yin, Beijing University of Posts and Telecommunications, China; and ShuFang Li, Beijing University of Posts and Telecommunications, China

**10 Parking Navigation for Alleviating Congestion in Multilevel Parking Facility**
Weihua Sun, Masahiro Kenmotsu, Keiichi Yasumoto, Minoru Ito and Naoki Shibata, Nara Institute of Science and Techonology, Japan

**11 A Proximity Sensor Based No-Touch Mechanismfor Mobile Applications on Smart Phones**
Chia-Yu Lin, National Chiao Tung University, Taiwan; Yu-Jia Chen, National Chiao Tung University, Taiwan; Li-Chun Wang, National Chiao Tung University, Taiwan; and Yu-Chee Tseng, National Chiao Tung University, Taiwan

**12 Request-adaptive Packet Dissemination for Context-aware Services in Vehicular Networks**
Kaveh Shafiee, University of British Columbia, Canada; Victor C.M. Leung, University of British Columbia, Canada; and Raja Sengupta, University of California, Berkeley, United States

**13 Secured VPN Models for LTE Backhaul Networks**
Madhusanka Liyanage, University of Oulu, Finland; and Andrei Gurtov, University of Oulu, Finland

**14 SPIN-based Verification of Authentication Protocols in WiMAX Networks**
Beth Komu, Mjumo Mzyece and Karim Djouani, Tshwane University of Technology, South Africa

**15 Economical Comparison of Enterprise In-building Wireless Solutions using DAS and Femto**
Zhen Liu, Aalborg University, Denmark; Troels Kolding, Nokia Siemens Networks, Denmark; Preben Mogensen, Aalborg University, Denmark; Benny Vejgaard, Nokia Siemens Networks, Denmark; and Troels Sorensen, Aalborg University, Denmark

**16 Impact of Density, Load, and Mobility on thePerformance of Routing Protocols in Vehicular Networks**
Bruno Mateus, Federal University of Ceara, Brazil; Carina Oliveira, Joseph Fourier University, France; Arthur Callado, Federal University of Ceara, Brazil; Stenio Fernandes, Federal University of Pernambuco, Brazil; and Rossana Andrade, Federal University of Ceara, Brazil

**17 Multichannel Cognitive Medium Access Control protocol for VANET**
Niravkumar Shah, Edith Cowan University, Australia; Iftekhar Ahmad, Edith Cowan University, Australia; and Daryoush Habibi, Edith Cowan University, Australia

**18 Grouped Interference Alignment in Inter-Vehicle Communications**
Takayuki Shimizu, Doshisha University, Japan; Akihisa Yokoyama, TOYOTA InfoTechnology Center, U.S.A., Inc., United States; and Hisato Iwai, Doshisha University, Japan

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## 4A: Decode and Forward II

**1 Iterative Slepian-Wolf Decoding and FEC Decoding for Compress-and-forward Systems**
Yinan Qi, University of Surrey, United Kingdom; Muhammad Ali Imran, University of Surrey, United Kingdom; and Rahim Tafazolli, University of Surrey, United Kingdom

**2 Data Detection for MIMO Broadcasting System with Decode-and-Forward Cooperation**
Shih-Jung Lu, Academia Sinica, Taiwan; Wei-Ho Chung, Academia Sinica, Taiwan; and Chiao-En Chen, National Chung Cheng University, Taiwan

**3 Outage Performance Of OFDM Ad-hoc Routing With and Without Subcarrier Grouping in Multihop Network**
A. Gouissem, Qatar University, Qatar; M. O. Hasna, Qatar University, Qatar; R. Hamila, Qatar University, Qatar; H. Besbes, Sup'Com, University of Carthage, Tunisia; and F. Abdelkefi, Sup'Com, University of Carthage, Tunisia

**4 Outage Analysis of Correlated Source Transmission in Block Rayleigh Fading Channels**
Meng Cheng, Japan Advanced Institute of Science and Technology, Japan; Khoirul Anwar, Japan Advanced Institute of Science and Technology, Japan; and Tad Matsumoto, Japan Advanced Institute of Science and Technology, Japan

**5 Physical Layer Network Coding with Channel and Delay Estimation**
Yixin Li, University of Reading, United Kingdom; and Fu-Chun Zheng, University of Reading, United Kingdom

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## 4B: HetNet I

**1 eICIC Functionality and Performance for LTE HetNet Co-Channel Deployments**
Klaus Pedersen, Nokia Siemens Networks, Denmark; Yuanye Wang, Powerwave Technologies, United States; Beatriz Soret, University of Aalborg, Denmark; and Frank Frederiksen, Nokia Siemens Networks, Denmark

**2 LTE HetNet Trial - Range Expansion including Micro/Pico Indoor Coverage Survey**
Peter Ökvist, Ericsson Research, Sweden; and Arne Simonsson, Ericsson Research, Sweden

**3 An Efficient Inter-cell Interference Coordination Scheme in Heterogeneous Cellular Networks**
Yanlong Wang, Yongyu Chang and Dacheng Yang, Beijing University of Posts and Telecommunications, China

**4 LTE Uplink CoMP Trial in a HetNet Deployment**
Arne Simonsson, Ericsson Research, Sweden; and Tomas Andersson, Ericsson System &Technology, Sweden

**5 Traffic Split Scheme Based on Common Radio Resource Management in an Integrated LTE and HSDPA Networks**
Ruiming Yang, Yongyu Chang, Jia Sun and Dacheng Yang, Beijing University of Posts and Telecommunications, China

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## 4C: LTE

**1 A Novel OFDM Power Based Estimation for Dynamic Channels Tracking in Downlink LTE**
Ali Kalakech, Univ Lille Nord de France, F-59000 Lille, IFSTTAR, LEOST, France; Loïc Brunel, Mitsubishi Electric R&D Center Europe, France; Marion Berbineau, Univ Lille Nord de France, F-59000 Lille, IFSTTAR, LEOST, France; and David Mottier, Mitsubishi Electric R&D Center Europe, France

**2 Measurement and Prediction of Turbo-SIC Receiver Performance for LTE**
Sofia Martinez Lopez, Orange Labs, France; Fabian Diehm, Technische Universität Dresden, Germany; Raphael Visoz, Orange Labs, France; and Baozhu Ning, Orange Labs, France

**3 Indoor Experiments on 4-by-2 Multi-user MIMO Employing Various Transmitter Antenna Arrangements in LTE-Advanced Downlink**
Yuichi Kakishima, NTT DOCOMO, INC., Japan; Teruo Kawamura, NTT DOCOMO, INC, Japan; Yoshihisa Kishiyama, NTT DOCOMO, INC., Japan; Hidekazu Taoka, DOCOMO Communications Laboratories Europe GmbH, Japan; Hidehiro Andoh, NTT DOCOMO, INC, Japan

**4 Novel Method to Improve Control Channel Reliability in LTE-Advanced Heterogeneous Network**
Yajun Zhu, DOCOMO Beijing Communications Laboratories Co., Ltd, China; Anxin Li, DOCOMO Beijing Communications Laboratories Co., Ltd, China; and Atsushi Harada, DOCOMO Beijing Communications Laboratories Co., Ltd, China

**5 Power Efficient Pilot Symbol Power Allocation under Time-variant Channels**
Michal Simko, Vienna University of Technology, Austria; Paulo S. R. Diniz, Universidade Federal do Rio de Janeiro, Brazil; Qi Wang, Vienna University of Technology, Austria; and Markus Rupp, Vienna University of Technology, Austria

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## 4D: FEC

**1 Low Complexity Progressive Edge-Growth algorithm based on Chinese Remainder Theorem**
Xueqin Jiang, Donghua University, China; Papa Ousmance Thiaw Diagne, Donghua University, China; Moon Ho Lee, Chonbuk National University, Korea, Republic of; and Wujun Xu, Donghua University, China

**2 Joint Maximum Likelihood and Expectation Maximization methods for Unsupervised Iterative Soft Bit Error Rate Estimation**
samir saoudi, Telecom Bretagne, France; jia dong, Telecom Bretagne, France; and tarik Ait-Idir, INPT, Morocco

**3 A Puncturing Scheme for Low-Density Parity-Check Codes Based on 1-SR Nodes**
Lijun Zhang, Beijing Jiaotong Univ., China; Fuli Ma, Chinese Academy of Sciences, China; and L. L. Cheng, City Univ. of Hong Kong, Hong Kong

**4 Adaptive trace-orthonormal STBC for MIMO system with capacity approaching FEC codes**
Ammar El Falou, Telecom Bretagne, France; Charlotte Langlais, Telecom Bretagne, France; Charbel Abdel Nour, Telecom Bretagne, France; and Catherine Douillard, Telecom Bretagne, France

**5 Hybrid Construction of Long LDPC Codes with Very Low Density**
Lijun Zhang, Beijing Jiaotong Univ., China; Yanjing Zhang, Beijing Jiaotong Univ., China; and L. L. Cheng, City Univ. of Hong Kong, Hong Kong

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## 4E: Energy Efficiency I

**1 Energy-Efficiency based Resource Allocation for the Orthogonal Multi-user Channel**
Fabien Heliot, University of Surrey, United Kingdom; Muhammad Ali Imran, University of Surrey, United Kingdom; and Rahim Tafazolli, University of Surrey, United Kingdom

**2 Dynamic Cell Expansion: Traffic Aware Low Energy Cellular Network**
Weisi Guo, University of Sheffield, United Kingdom; and Tim O'Farrell, University of Sheffield, United Kingdom

**3 Analysis of Delay-Energy Tradeoff and Energy Minimization Schemes for Group-based Machine-to-Machine Communications in OFMDA Cellular Networks**
Chieh Yuan Ho, National Chiao Tung University, Taiwan; and Ching-Yao Huang, National Chiao Tung University, Taiwan

**4 An Iterative Water-filling Based Resource Allocation Scheme in OFDMA Systems for Energy Efficiency Optimization**
Zhiyong Feng, Zhiqing Wei, Tianping Shuai, Qixun Zhang and Rong Li, Beijing University of Posts and Telecommunications, China

**5 A Dynamic Energy Savings Scheme Based on Enhanced Mobility Load Balancing**
Jinlin Peng, USTC, China; Peilin Hong, USTC, China; Kaiping Xue, USTC, China; and Hao Tang, USTC, China

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## 4F: Beamforming and Antenna Selection

**1 Frequency-domain One-Tap Weight Control for Single-carrier Multiple Access with Multiple Antennas**
Wei Peng, Tohoku University, Japan; Fumiyuki Adachi, Tohoku University, Japan; and Xiangyang Wang, Southeast Univeristy, China

**2 Robust transmit beamforming for multigroup multicasting**
Zhenyuan Chen, Wenyi Zhang and Guo Wei, University of Science and Technology of China, China

**3 Hardware implementation of proposed antenna selection algorithm and its performance evaluation using received signals in field experiment**
Kazuhiko Mitsuyama, Japan Broadcasting Corporation, Japan; Tetsuomi Ikeda, Japan Broadcasting Corporation, Japan; and Tomoaki Ohtsuki, Keio University, Japan

**4 Orthogonality-Based User and Receive Antenna Selection for MIMO Broadcast Channels**
Xinlei Wang, Zhejiang University, China; Yabo Li, Zhejiang University, China; and Zhaoyang Zhang, Zhejiang University, China

**5 Weighted MMSE Beamforming Design for Weighted Sum-rate Maximization in Coordinated Multi-Cell MIMO Systems**
Fan Sun, Aalborg University, Denmark; and Elisabeth de Carvalho, Aalborg University, Denmark

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## 4P: Multiple Antennas Posters

**1 Ergodic Capacity of Multi-User MIMO Systems Using Pilot-Based Channel Estimation, Quantized Feedback and Outdated Feedback as well as User Selection**
Fan Jin, University of Southampton, United Kingdom; and Lajos Hanzo, University of Southampton, United Kingdom

**2 Joint Optimization of Transmit Power and Codebook Size for Multiuser MISO Systems**
Xiaoming Chen, College of Electronic Information Engineering, Nanjing University of Aeronautics and Astronautics, China; Zhaoyang Zhang, Department of Information Science and Electronic Engineering, Zhejiang University, China; Lei Lei, College of Electronic Information Engineering, Nanjing University of Aeronautics and Astronautics, China; and Shaolei Chen, Department of Information Science and Electronic Engineering, Zhejiang University, China

**3 Multi-Antenna Uplink Transmission for LTE-A**
yan Meng, Alcatel-Lucent Shanghai Bell, China; gang Shen, Alcatel-Lucent Shanghai Bell, China; jiyong Pang, Alcatel-Lucent Shanghai Bell, China; wei Wang, Alcatel-Lucent Shanghai Bell, China; feng Han, Alcatel-Lucent Shanghai Bell, China; and dongyao Wang, Alcatel-Lucent Shanghai Bell, China

**4 A Differential Codebook Using 8-PSK Alphabets for Slowly Fading Channels**
Yeong Ju Kim, Chungbuk National University, South Korea

**5 New Decoding Algorithms for Matrix C in the 802.16e WiMAX Standard**
Young Gil Kim, Univ. of Seoul, Korea, Republic of; and Norman Beaulieu, Univ. of Alberta, Canada

**6 Successive Interference Cancelation via Rank-Reduced Maximum Likelihood Detection**
Hyukjoon Kwon, Samsung US R&D Center, United States; Jungwon Lee, Samsung US R&D Center, United States; and Inyup Kang, Samsung US R&D Center, United States

**7 Prioritized Adaptive Modulation for MIMO-OFDM Using Pre-Ordered SIC**
Khaled Hassan, German University in Cairo, Egypt; and Khodr Saaifan, Jacobs University Bremen gGmbH, Germany

**8 Successive Optimization Transmission for high and low SNR stations in Wireless LAN Systems**
Riichi Kudo, Koichi Ishihara, Tomoki Murakami, B. A. Hirantha Abeysekera, Yusuke Asai and Masato Mizoguchi, NTT Network Innovation Laboratories, Japan

**9 Experimental results on the performance of Optical Spatial Modulation systems**
Enrique Poves, Wasiu Popoola, Harald Haas, John Thompson, University of Edinburgh, United Kingdom; and Daniel Cárdenas, Universidad San Francisco de Quito, Ecuador

**10 Antenna Placement Designs for Distributed Antenna Systems with Multiple-Antenna Ports**
Changhee Lee, Korea University, South Korea; Eunsung Park, Korea University, South Korea; and Inkyu Lee, Korea University, South Korea

**11 Efficient SVD-based Transmission Strategy against High-Speed Mobility in TDD MIMO Systems**
Lihua Li, Beijing University of Posts and Telecommunication, China; Qi Sun, Beijing University of Posts and Telecommunication, China; and Jin Jin, Beijing University of Posts and Telecommunication, China

**12 Reduced-Complexity SFBC-OFDM for Vehicular Channels with High Mobility**
Ahmed Abotabl, Nile University, Egypt; Amr El-Keyi, Nile University, Egypt; Yahya Mohasseb, Nile University, Egypt; and tamer Elbatt, Nile University, Egypt

**13 Adaptive Generalized Space Shift Keying (GSSK) Modulation for MISO Channels: A New Method for High Diversity and Coding Gains**
Konstantinos Ntontin, Telecommunications Technological Centre of Catalonia (CTTC), Spain; Marco Di Renzo, French National Center for Scientific Research (CNRS), France; Ana Perez-Neira, Telecommunications Technological Centre of Catalonia (CTTC), Spain; and Christos Verikoukis, Telecommunications Technological Centre of Catalonia (CTTC), Spain

**14 Performance Evaluation of Reconfigurable MIMO Systems in Spatially Correlated Frequency-Selective Fading Channels**
Vida Vakilian, Ecole Polytechnique de Montreal, Canada; Jean-Francois Frigon, Ecole Polytechnique de Montreal, Canada; and Sebastien Roy, Laval University, Canada

**15 An Interference Alignment Scheme for 60 GHz Millimeter-wave Communication System**
Jianxiong Zhao, Beijing University of Posts and Telecommunications, China; and Danpu Liu, Beijing University of Posts and Telecommunications, China

**16 Novel Receive Diversity Scheme Using ESPAR Antenna and Arbitrary Frequency Band**
Wataru Arita, University of the Ryukyus, Japan; and Masato Saito, University of the Ryukyus, Japan

**17 A Hybrid MMSE and K-Best Detection Scheme for MIMO Systems**
Cheng-Yu Hung, Academia Sinica, Taiwan; Ronald Y. Chang, Academia Sinica, Taiwan; and Wei-Ho Chung, Academia Sinica, Taiwan

**18 OFDM Aided Space-Time Shift Keying for Dispersive Downlink Channels**
Marco Driusso, Università di Trieste, Italy; Fulvio Babich, Università di Trieste, Italy; Lajos Hanzo, University of Southampton, United Kingdom; and Mohammad Ismat Kadir, University of Southampton, United Kingdom

**19 Performance of Multiuser MIMO-OFDM System with Fractional Sampling in Street Canyon Area**
Kenta Eguchi, Keio University, Japan; Mamiko Inamori, Keio University, Japan; and Yukitoshi Sanada, Keio University, Japan

**20 A Transmit Beamforming Algorithm for High-Speed Train Communication**
Qinglin Luo, Alcatel-Lucent Shanghai Bell, China; Wei Fang, Alcatel-Lucent Shanghai Bell, China; Tao Yang, Alcatel-Lucent Shanghai Bell, China; and Dongyao Wang, Alcatel-Lucent Shanghai Bell, China

**21 Pilot Aided Channel Estimation for a 2×2 MIMO DVB-T2 system in High Speed Mobile Environment**
Nico Surantha, Kyushu Institute of Technology, Japan; Tatsumi Uwai, Kyushu Institute of Technology, Japan; Yuhei Nagao, Kyushu Institute of Technology, Japan; Masayuki Kurosaki, Kyushu Institute of Technology, Japan; Baiko Sai, Kyushu Institute of Technology, Japan; and Hiroshi Ochi, Kyushu Institute of Technology, Japan

**22 Partitioned Vector Quantization for MU-MIMO Downlink Broadcasting**
Mirza Kibria, Kyoto University, Japan; Hidekazu Murata, Kyoto University, Japan; Susumu Yoshida, Kyoto University, Japan; Koji Yamamoto, Kyoto University, Japan; Daisuke Umehara, Kyoto Institute of Technology, Japan; Satoshi Denno, Okayama University, Japan; and Masahiro Morikura, Kyoto University, Japan

**23 Step reduced K-best sphere decoding**
Xinyu Mao, Peking University, China; Yuxin Cheng, Peking University, China; Lili Ma, Peking University, China; and Haige Xiang, Peking University, China

**24 Analysis of Vertical Sectorization for HSPA on a System Level: Capacity and Coverage**
Youqi Fu, Beijing University of Posts and Telecommunications, China; Jian Wang, Nokia Siemens Networks, Beijing, China; Zhuyan Zhao, Nokia Siemens Networks, Beijing, China; Liyun Dai, Jiangxi University of Finance and Economics, China; and Hongwen Yang, Beijing University of Posts and Telecommunications, China

**25 Field Experiments of Linearly Precoded Multi-User MIMO System at 5GHz Band**
Masato Taniguchi, Kyoto University, Japan; Hidekazu Murata, Kyoto University, Japan; Susumu Yoshida, Kyoto University, Japan; Koji Yamamoto, Kyoto University, Japan; Daisuke Umehara, Kyoto Institute of Technology, Japan; Satoshi Denno, Okayama University, Japan; and Masahiro Morikura, Kyoto University, Japan

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## 5A: Source and Channel Coding

**1 A Robust Communication System Based on Joint-Source Channel Coding for a Uniform Source**
Hieu Nguyen, Tor Ramstad and Ilangko Balasingham, Norwegian University of Science and Technogy, Norway

**2 Rateless Codes with Progressive Recovery for Layered Multimedia Delivery**
Zhao Chen, Tsinghua University, China; Liuguo Yin, Tsinghua University, China; Mai Xu, Tsinghua University, China; and Jianhua Lu, Tsinghua University, China

**3 Design of Low-Delay Distributed Joint Source-Channel Codes Using Irregular LDPC Codes**
Iqbal Shahid, University of Manitoba, Canada; and Pradeepa Yahampath, University of Manitoba, Canada

**4 Distributed Lossy Source Coding Using Real-Number Codes**
Mojtaba Vaezi, McGill University, Canada; and Fabrice Labeau, McGill University, Canada

**5 EXIT Chart Based Joint Source-Channel Coding for Binary Markov Sources**
Xiaobo Zhou, Japan Advanced Institute of ScienceTechnology (JAIST), Japan; Khoirul Anwar, Japan Advanced Institute of ScienceTechnology (JAIST), Japan; and Tad Matsumoto, Japan Advanced Institute of Science and Technology (JAIST), Japan

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## 5B: Interference Alignment and Cancellation

**1 MMSE-Based Optimal Design of Full-Duplex Relay System**
Kanghee Lee, Wichita State University, United States; Hyuck M. Kwon, Wichita State University, United States; Mansik Jo, Wichita State University, United States; Hyuncheol Park, Korea Advanced Institute of ScienceTechnology, South Korea; and Yong H. Lee, Korea Advanced Institute of Science and Technology, South Korea

**2 Interference Alignment with Random Vector Quantization for MIMO Interference Channels**
Hyun-Ho Lee, Korea University, South Korea; and Young-Chai Ko, Korea University, South Korea

**3 Non-Parametric Interference Cancellation for CDMA Uplink System**
Wei Zhang, Qualcomm Inc, United States; and Sharad Sambhwani, Qualcomm Inc, United States

**4 GFDM Interference Cancellation for Flexible Cognitive Radio PHY Design**
Rohit Datta, TU Dresden, Germany; Nicola Michailow, TU Dresden, Germany; Michael Lentmaier, TU Dresden, Germany; and Gerhard Fettweis, TU Dresden, Germany

**5 IBI Cancellation and Circular Property Restoration for Broadband DS-CDMA Using FDE without CP Insertion**
Min Zheng, Tohoku University, Japan; Wei Peng, Tohoku University, Japan; and Fumiyuki Adachi, Tohoku University, Japan

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## 5C: Energy Efficiency II

**1 Power-Efficient Radio Resource Allocation for Low-Medium-Altitude Aerial Platform Based TD-LTE Networks**
Liqiang Zhao, ISN, Xidian Univeristy, China; Chi Zhang, ISN, Xidian Univeristy, China; Hailin Zhang, ISN, Xidian Univeristy, China; Xiaohui Li, ISN, Xidian Univeristy, China; and Lajos Hanzo, University of Southampton, China

**2 Joint Selection of On/off Relay Mode and Adaptive Modulation Mode for Green Cooperative Multicast Networks**
Shi-Yong Lee, Academia Sinica, Taiwan; and De-Nian Yang, Academia Sinica, Taiwan

**3 A Centralised Approach to Power On-Off Optimisation for Heterogeneous Networks**
Georgios Koudouridis, Huawei Technologies Sweden, R&D Center, Sweden; Hui Gao, Huawei Technologies Sweden, R&D Center, Sweden; and Peter Legg, Huawei Technologies Sweden, R&D Center, Sweden

**4 Energy-Efficient Binary Power Control with Bit Error Rate Constraint in MIMO-OFDM Wireless Communication Systems**
Xi Huang, Huazhong University of Science & Technology, Wuhan, China; Xiaohu Ge, Huazhong University of Science & Technology, Wuhan, China; Yuming Wang, Huazhong University of Science & Technology, Wuhan, China; Frank Y. Li, University of Agder, Norway; and Jing Zhang, Huazhong University of Science & Technology, Wuhan, China

**5 AF MIMO Wireless Relay Networks Under Received Power Constraint**
Kanghee Lee, Wichita State University, United States; Hyuck M. Kwon, Wichita State University, United States; Hyunggi Kim, Wichita State University, United States; Edwin M. Sawan, Wichita State University, United States; Hyuncheol Park, Korea Advanced Institute of ScienceTechnology, South Korea; and Yong H. Lee, Korea Advanced Institute of Science and Technology, South Korea

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## 5D: Multiple Access System Performance evaluation

**1 Impact of Outdated Feedback on the Performance of M-QAM Adaptive Modulation in User Selection Diversity Systems with OSTBC over MIMO Rayleigh Fading Channels**
Mohammad Torabi, École Polytechnique de Montréal, Canada; and Jean-François Frigon, École Polytechnique de Montréal, Canada

**2 The Potential of a Hybrid Fixed/User Relay Architecture- A Performance Analysis**
Agisilaos Papadogiannis, Chalmers University of Technology, Sweden; Yutao Sui, Chalmers University of Technology, Sweden; and Tommy Svensson, Chalmers University of Technology, Sweden

**3 IEEE 802.11n: Performance Analysis with Spatial Expansion, Receive Diversity and STBC**
Roger Hoefel, Federal University of Rio Grande do Sul (UFRGS), Brazil

**4 Performance Study of IEEE 802.11s PSM in FTP-TCP**
Mirza Nazrul Alam, Aalto University, Finland; Riku Jäntti, Aalto University, Finland; Jarkko Kneckt, Nokia Research Center, Finland; and Johanna Nieminen, Nokia Research Center, Finland

**5 Towards Improved QoS in 802.16e Mobile WiMAX**
Norman Beaulieu, Univ. of Alberta, Canada; Young Gil Kim, Univ. of Seoul, Korea, Republic of; and Mohamed Damen, Univ. of Waterloo, Canada

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## 5E: Positioning Systems I

**1 Neural Network-Based Accuracy Enhancement Method for WLAN Indoor Positioning**
Yubin Xu and Yongliang Sun, Communication Research Center, Harbin Institute of Technology, China

**2 FG-based Cooperative Group Localization for Next-generation Communication Networks**
Xuefei Zhang, Qimei Cui, Yulong Shi and Xiaofeng Tao, Beijing University of Posts and Telecommunications, China

**3 Cramer-Rao Lower Bounds for Hybrid Distance Estimation Schemes**
Stephan Sand, Wei Wang and Armin Dammann, German Aerospace Center (DLR), Germany

**4 AP Selection for Indoor Localization Based on Neighborhood Rough Sets**
Yujia Zhu, Beijing University of PostsTelecommunications, China; and Zhongliang Deng, Beijing University of Posts and Telecommunications, China

**5 The performance of Simulated Annealing Algorithms for Wi-Fi Localization using Google Indoor Map**
Xin Zheng, Guanqun Bao, Ruijun Fu, and Kaveh Pahlavan, Worcester Polytechnic Institute, United States

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## 5F: LTE Networks

**1 LTE FDD Physical Random Access Channel Dimensioning and Planning**
Carlos Ubeda, Ericsson, Spain; Salvador Pedraza, Ericsson, Spain; Miguel Regueira, Ericsson, Spain; and Javier Romero, Ericsson, Spain

**2 Comparison of LTE Performance Indicators and Throughput in Indoor and Outdoor Scenarios at 700 MHz**
Ching-pu Wu, University of Colorado at Boulder, United States; and Kenneth Baker, University of Colorado at Boulder, United States

**3 A High-efficient Algorithm Of Mobile Load Balancing in LTE System**
Ying Yang, University of Science and Technology of China, China; Pengfei Li, University of Science and Technology of China, China; Xiaohui Chen, University of Science and Technology of China, China; and Weidong Wang, University of Science and Technology of China, China

**4 Interference Evaluation for Distributed Collaborative Radio Resource Allocation in Downlink of LTE Systems**
Bahareh Jalili, University of Surrey, United Kingdom; Mahima Mehta, Indian Institute of Technology Bombay, India; Mehrdad Dianati, University of Surrey, United Kingdom; Abhay Karandikar, Indian Institute of Technology Bombay, India; and Barry G. Evans, University of Surrey, United Kingdom

**5 Optimal Configuration of Fractional Frequency Reuse System for LTE Cellular Networks**
Muhieddin Amer, Rochester Institue of Technology, United Arab Emirates

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## 5P: Transmission Technologies Posters

**1 IIR Lattice-Based Blind Equalization Algorithms**
Hsiao-Fu Lee, Fu Jen Catholic University, Taiwan; Jenq-Tay Yuan, Fu Jen Catholic University, Taiwan; and Tzu-Chao Lin, Fu Jen Catholic University, Taiwan

**2 Influence of HARQ with Unreliable Feedback on the Throughput of UMTS LTE**
Tobias Breddermann, RWTH Aachen University, Germany; Benedikt Eschbach, RWTH Aachen University, Germany; and Peter Vary, RWTH Aachen University, Germany

**3 Stop-and-Wait Hybrid-ARQ performance at IP level under imperfect feedback**
Sébastien Marcille, Thales Communications and Security, France; Philippe Ciblat, Telecom Paristech, France; and Christophe Le Martret, Thales Communications and Security, France

**4 The Quasi-Uniform Redundant Carrier Placement for UW-OFDM**
Heidi Steendam, Ghent University, Belgium

**5 Performance of DPPAM UWB Communication Systems over Indoor Fading Channels**
Tingting Lu, Ocean University of China, China; Hao Zhang, Ocean University of China, China; and Aaron Gulliver, University of Victoria, Canada

**6 Bi-directional DFEs for Plastic Optical Fiber based In-vehicle Infotainment System at 2-3Gbit/s**
Yixuan Wang, Institute of Telecommunications (INUE), University of Stuttgart, Germany; Lukas Mauch, Institute of Telecommunications (INUE), University of Stuttgart, Germany; and Joachim Speidel, Institute of Telecommunications (INUE), University of Stuttgart, Germany

**7 Throughput Performance of CF-Based Adaptive PAPR Reduction Method for Eigenmode MIMO-OFDM Signals with AMC**
Shoki Inoue, Tokyo University of Science, Japan; Teruo Kawamura, NTT DOCOMO, INC., Japan; and Kenichi Higuchi, Tokyo University of Science, Japan

**8 Performance Analysis of Spatial Modulation over Correlated Fading Channels**
Mutlu Koca, Bogazici University, Turkey; and Hikmet Sari, Supelec, France

**9 BER of Noncoherent MFSK with Postdetection Switch-and-Stay Combining in TWDP Fading**
Sasan Haghani, University of the District of Columbia, United States; and Hadis Dashtestani, University of the District of Columbia, United States

**10 Effects of Feedback Delay on the Performance of Multiple Relay Network over Nakagami-m Fading Channels**
Nuwan S. Ferdinand, University of Oulu, Finland; Nandana Rajatheva, University of Oulu, Finland; and Matti Latva-aho, University of Oulu, Finland

**11 Throughput-maximising link configuration for mutually interfering data terminals**
Virgilio Rodriguez, Universität Paderborn, Germany

**12 Effect of Channel Noise on Fractionally Spaced CMA and MMA**
Jenq-Tay Yuan, Fu Jen Catholic University, Taiwan; Jen-Hung Chao, Fu Jen Catholic University, Taiwan; and Tzu-Chao Lin, Fu Jen Catholic University, Taiwan

**13 Iterative Block Decision Feedback Equalizer for Time-Frequency Interleave Diversity Scheme**
Hongliang Mao, Tsinghua University, China; Yukui Pei, Tsinghua University, China; and Ning Ge, Tsinghua University, China

**14 A Novel Hybrid ARQ Scheme Based on LDPC Code Extension and Feedback**
Hamid Saber, Carleton University, Canada; and Ian Marsland, Carleton University, Canada

**15 Feedback in LT Codes for Prioritized and Non-Prioritized Data**
Jesper H. Sørensen, Aalborg University, Denmark; Petar Popovski, Aalborg University, Denmark; and Jan Østergaard, Aalborg University, Denmark

**16 The Smearing Filter Design Techniques for Data Transmission**
Grace Oletu, University of Greenwich, United Kingdom; Predrag Rapajic, University of Greenwich, United Kingdom; Kwashie Anang, University of Greenwich, United Kingdom; Ruiheng Wu, University of Greenwich, United Kingdom; and Titus Eneh, University of Greenwich, United Kingdom

**17 Superposition Coded Modulation for Cooperative Communications**
Hua Sun, University of Southampton, United Kingdom; Soon Xin Ng, University of Southampton, United Kingdom; and Lajos Hanzo, University of Southampton, United Kingdom

**18 Optimum Signal Shaping in OFDM-based Optical Wireless Communication Systems**
Svilen Dimitrov, The University of Edinburgh, United Kingdom; and Harald Haas, The University of Edinburgh, United Kingdom

**19 New Algorithms for Peak-to-mean Envelope Power Reduction of OFDM Systems Through Sign Selection**
M. Ghasemi Damavandi, University of British Columbia, Canada; A. Abbasfar, University of Tehran, Iran, Islamic Republic of; and D. G. Michelson, University of British Columbia, Canada

**20 Comparison of Coded Modulations for Trellis-Shaped Single-Carrier PSK with PAPR Reduction**
Yuuki Nishino, Yokohama National University, Japan; and Hideki Ochiai, Yokohama National University, Japan

**21 Analytical Study of Multi-Antenna Relaying Systems in the Presence of Co-Channel Interference**
Kasun Hemachandra, University of Alberta, Canada; and Norman Beaulieu, University of Alberta, Canada

**22 Performance Analysis of OFDM Systems over 60 GHz Indoor Channels**
Hsin-yueh Hsu, MediaTek Inc., Taiwan; Tzung-Hua Tsai, National Tsing Hua University, Taiwan; Wei-De Wu, MediaTek Inc., Taiwan; and Chi-chao Chao, National Tsing Hua University, Taiwan

**23 Bit Error Rate Performance of Generalized Frequency Division Multiplexing**
Nicola Michailow, Technische Universität Dresden, Germany; Stefan Krone, Technische Universität Dresden, Germany; Michael Lentmaier, Technische Universität Dresden, Germany; and Gerhard Fettweis, Technische Universität Dresden, Germany

**24 Performance Evaluation and Comparison between Iterative DS-CDMA and NDMA**
Francisco Ganhão, Universidade Nova de Lisboa, Portugal; Rui Dinis, Universidade Nova de Lisboa, Portugal; Luis Bernardo, Universidade Nova de Lisboa, Portugal; and Rodolfo Oliveira, Universidade Nova de Lisboa, Portugal

**25 Stochastic Optimization Assisted Joint Channel Estimation and Multi-User Detection for OFDM/SDMA**
Jiankang Zhang, Zhengzhou University, China; Sheng Chen, University of Southampton, United Kingdom; Xiaomin Mu, Zhengzhou University, China; and Lajos Hanzo, University of Southampton, United Kingdom

**26 Joint Optimization of Bit and Power Allocation for Multicarrier Systems with Average BER Constraint**
Ebrahim Bedeer, Memorial University, Canada; Octavia A. Dobre, Memorial University, Canada; Mohamed H. Ahmed, Memorial University, Canada; and Kareem E. Baddour, Communications Research Centre, Canada

**27 An Efficient Method of Constructing Quasi-Cyclic Low-Density Parity-Check Codes**
Zhanji Wu, Beijing University of Post and Telecommunication, China; and Jiao Cheng, Beijing University of Post and Telecommunication, China

**28 A New Genetics-Aided Message Passing Decoding Algorithm for LDPC Codes**
Jui-Hui Hung, National Chiao Tung University, Taiwan; Yi-De Lu, National Chiao Tung University, Taiwan; and Sau-Gee Chen, National Chiao Tung University, Taiwan

**29 A low-complexity distributed Inter-Cell Interference Coordination (ICIC) Scheme for emerging multi-cell HetNets**
Chrysovalantis Kosta, University of Surrey, United Kingdom; Bernard Hunt, University of Surrey, United Kingdom; Atta U. Quddus, University of Surrey, United Kingdom; and Rahim Tafazolli, University of Surrey, United Kingdom

**30 Reliable Data Aided Sparsity-Aware Approaches to Clipping Noise Estimation in OFDM Systems**
Junho Lee, University of ScienceTechnology, Korea, Republic of; and Seung-Hwan Lee, ETRI, Korea, Republic of

**31 Computationally Efficient PAPR Reduction schemesin OFDM-Based Satellite Communication Systems**
Emad Al-Dalakta, Newcastle University, United Kingdom; Charalampos Tsimenidis, Newcastle University, United Kingdom; Bayan Sharif, Newcastle University, United Kingdom; and Arafat Al-Dweik, Khalifa University, Sharjah, United Arab Emirates

**32 A Statistical Model for Uplink Intercell Interferencewith Power Adaptation and Greedy Scheduling**
Hina Tabassum, King Abdullah University of Science and Technology (KAUST), Saudi Arabia; Ferkan Yilmaz, King Abdullah University of Science and Technology (KAUST), Saudi Arabia; Zaher Dawy, American University of Beirut (AUB), Lebanon; and Mohamed Slim Alouini, King Abdullah University of Science and Technology (KAUST), Saudi Arabia

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## 6A: Impulsive Noise

**1 Efficient Nonlinear Detector of Binary Signals in Rayleigh Fading and Impulsive Interference**
Khodr Saaifan, Jacobs University Bremen, Germany; Khaled Hassan, German University in Cairo, Egypt; and Werner Henkel, Jacobs University Bremen, Germany

**2 An Efficient Technique for OFDM Systems over Fading Channels Impaired by Impulsive Noise**
Sabah Nayyef, Newcastle University, United Kingdom; Arafat Al-Dweik, Khalifa University, Sharjah, United Arab Emirates; Ali Hazmi, Tampere University of Technology, Finland; Bayan Sharif, Newcastle University, UK, United Kingdom; and Charalampos Tsimenidis, Newcastle University, UK, United Kingdom

**3 A Simplified LLR-Based Detector for Signals in Class-A Noise**
Tarik Shehata Saleh, Systems & Computer Engineering, Canada; Ian Marsland, Carleton University, Canada; and Mohamed El-Tanany, Carleton University, Canada

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## 6B: Mobile Satellite Systems

**1 TCP Performance Evaluation over GEO and LEO Satellite Links between Performance Enhancement Proxies**
Fei Peng, University of British Columbia, Canada; Ángel Salamanca Cardona, Universidad Politécnica de Madrid, Spain; Kaveh Shafiee, University of British Columbia, Canada; and Victor C.M. Leung, University of British Columbia, Canada

**2 End-to-End Performance of Satellite Mobile Communications with Multi-Beam Interference**
Fei Yang, University of ScienceTechnology of China, China; Meiyu Huang, University of ScienceTechnology of China, China; Sihai Zhang, University of ScienceTechnology of China, China; and Wuyang Zhou, University of Science and Technology of China, China

**3 Flexible Bandwidth Allocation Scheme based on Traffic Demands and Channel Conditions for Multi-beam Satellite Systems**
Un Hee Park, ETRI, South Korea; Hee Wook Kim, ETRI, South Korea; Dae Sub Oh, ETRI, South Korea; and Bon Jun Ku, ETRI, South Korea

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## 6C: Cognitive Radio Protocols and Algorithms

**1 Load-Balancing Spectrum Decision for Cognitive Radio Networks with Unequal-Width Channels**
Samer Talat, National Chiao Tung University, Taiwan; and Li-Chun Wang, National Chiao Tung University, Taiwan

**2 SWITCH: A Multichannel MAC Protocol for Cognitive Radio Ad Hoc Networks**
Mohamed Kalil, Ilmenau University of Technology, Germany; Andre Puschmann, Ilmenau University of Technology, Germany; and Andreas Mitschele-Thiel, Ilmenau University of Technology, Germany

**3 Dynamic Selection of Priority Queueing Discipline in Cognitive Radio Networks**
Arash Azarfar, École Polytechnique de Montréal, Canada; Jean-François Frigon, École Polytechnique de Montréal, Canada; and Brunilde Sansò, École Polytechnique de Montréal, Canada

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## 6D: Cooperative Sensing

**1 Optimal Cooperative Spectrum Sensing in Cognitive Radio with Taguchi Method**
Yingying Ma, University of Illinois at Chicago, United States; and Derong Liu, University of Illinois at Chicago, United States

**2 Goodness-of-Fit-based Malicious User Detection in Cooperative Spectrum Sensing**
Gosan Noh, Yonsei University, Korea, Republic of; Sungmook Lim, Yonsei University, Korea, Republic of; Seokwon Lee, Yonsei University, Korea, Republic of; and Daesik Hong, Yonsei University, Korea, Republic of

**3 Distributed Robust Channel Assignment for Multi-Radio Cognitive Radio Networks**
Maryam Ahmadi, University of Victoria, Canada; Yanyan Zhuang, University of Victoria, Canada; and Jianping Pan, University of Victoria, Canada

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## 6E: Coexistence of Multiple Radio Access Technologies

**1 Physical Cell Identity Assignment in Heterogeneous Networks**
Oumer Teyeb, Ericsson Research, Sweden; Gunnar Mildh, Ericsson Research, Sweden; and Anders Furuskär, Ericsson Research, Sweden

**2 Flow Splitting for Multi-RAT Heterogeneous Networks**
Xiao Ma, Min Sheng and Yan Zhang, Xidian University, China

**3 Effects and Implications of Beacon Collisions in Co-located IEEE 802.15.4 Networks**
Noorsalwati Nordin and Falko Dressler, University of Innsbruck, Austria

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### 6F: DVB and DAB techniques

**1 Comparison of Policy Realization Strategies for LTE Networks**
Usama Mir and Loutfi Nuaymi, Institut Mines Telecom, Telecom Bretagne, France

**2 Handheld Receivers Coverage by DVB-T2**
Muhammad Moiz Anis, Xavier Lagrange and Ramesh Pyndiah, Telecom Bretagne, France

**3 Spectrum Sensing for DVB-T Signals EmployingPilot Tones**
Ser Wah Oh, Ronghong Mo and Bo Wang, Institute for Infocomm Research, Singapore

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### 7A: Limited Feedback

**1 Hadamard Transform Based Codebook Design for Uniform Circular Arrays in Mobile Radio Communications**
Lu Wu, Research & Innovation Center, Alcatel-Lucent Shanghai Bell, China; Hongwei Yang, Research & Innovation Center, Alcatel-Lucent Shanghai Bell, China; and Dongyao Wang, Research & Innovation Center, Alcatel-Lucent Shanghai Bell, China

**2 A PMI Feedback Scheme for Downlink Multi-user MIMO Based on Dual-Codebook of LTE-Advanced**
Yongyu Dai, Southeast University, China; Shi Jin, Southeast University, China; Lei Jiang, NEC Laboratories, China; Xiqi Gao, Southeast University, China; and Ming Lei, NEC Laboratories, China

**3 Adaptive Bit Allocation in Rateless Coded MISO Downlink System with Limited Feedback**
Shaolei Chen, Department of Information Science and Electronic Engineering, Zhejiang University, China; Zhaoyang Zhang, Department of Information Science and Electronic Engineering, Zhejiang University, China; Xiaoming Chen, College of Electronic and Information Engineering, Nanjing University of Aeronautics and Astronautics, China; Huazi Zhang, Department of Information Science and Electronic Engineering, Zhejiang University, China; and Chau Yuen, Singapore University of Technology and Design (SUTD), Singapore

**4 Enhanced Index Assignment for Beamforming with Limited-rate Imperfect Feedback**
NOE YOON PARK, Chungbuk National University, South Korea; and YOUNG JU KIM, Chungbuk National University, South Korea

**5 Resource Allocation between Feedback and Forward MIMO Links and Energy Consumption**
Daniel Sacristán-Murga, Centre Tecnològic de Telecomunicacions de Catalunya (CTTC), Spain; Antonio Pascual-Iserte, Universitat Politècnica de Catalunya (UPC), Spain; and Víctor P. Gil Jiménez, Universidad Carlos III de Madrid, Spain

**6 A Compressed Analog Feedback Strategy for Spatially Correlated Massive MIMO Systems**
Junho Lee, University of ScienceTechnology, Korea, Republic of; and Seung-Hwan Lee, ETRI, Korea, Republic of

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### 7B: Amplify and Forward

**1 Inter-Relay Interference Cancellation for AF MIMO Two-Path Relay Systems**
Heesun Park, The Attached Institute of ETRI, Korea, Republic of; and Joohwan Chun, Korea Advanced Institute of Science and Technology, Korea, Republic of

**2 EM Algorithm based Channel Estimation for Amplify-and-Forward Relay Networks with Unknown Noise Correlation**
Chao Zhang, Xi'an Jiaotong University, China; Suhua Tang, ATR Adaptive Communications Research Laboratories, Japan; and Pinyi Ren, Xi'an Jiaotong University, China

**3 Asymptotic Outage Probability for Amplify-and-Forward CDMA Systems over Nakagami-m Fading Channels**
Ali Mehemed, Concordia University, Canada; and Walaa Hamouda, Concordia University, Canada

**4 Exact Error Analysis of Dual-Hop Fixed-Gain AF Relaying over Arbitrary Nakagami-m Fading**
Imène Trigui, INRS, Canada; Sofiène Affes, INRS, Canada; and Alex Stéphenne, INRS, Canada

**5 Channel Tracking for AF MIMO Relaying Systems**
Panagiota Lioliou, Chalmers University of Technology, Sweden; Daniel Svensson, Chalmers University of Technology, Sweden; and Mats Viberg, Chalmers University of Technology, Sweden

**6 Resource Allocation for Opportunistic Spectrum Sharing Based on Cooperative OFDM Relaying**
Wei Dang Lu, Zhejiang University of Technology, China; Yi Gong, Nanyang Technological University, Singapore; Xuan Li Wu, Harbin Institute of Technology, China; Han Qing Li, Harbin Institute of Technology, China; and Nai Tong Zhang, Harbin Institute of Technology, China

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### 7C: MIMO/OFDM-based Cognitive Radio

**1 Opportunistic Spatio-Frequency Access in CR-MIMO System Exploiting Primary Transmission Mode Information**
Zhao Li, Xidian University, China

**2 Optimal Resource Allocation Scheme in OFDM-Based Cognitive Radio Networks**
Mi Zhang, Beijing University of Technology, China; Pengbo Si, Beijing University of Technology, China; Yanhua Zhang, Beijing University of Technology, China; and Ruizhe Yang, Beijing University of Technology, China

**3 Performance Improvements of OFDM Signals Spectrum Sensing in Cognitive Radio**
Elena Guzzon, University of Roma Tre, Italy; Francesco Benedetto, University of Roma Tre, Italy; and Gaetano Giunta, University of Roma Tre, Italy

**4 A Novel Antenna Assignment Algorithm For Spectrum Underlay in Cognitive MIMO Networks**
Elmahdi Driouch, Université du Québec à Montréal, Canada; Wessam Ajib, Université du Québec à Montréal, Canada; and Taher Jalloul, Université du Québec à Montréal, Canada

**5 Low-Complexity Spectral Precoding for Rectangularly Pulsed OFDM**
Wei Jiang, Huawei Technologies Co. Ltd., China; and Zhao Zhao, Leibniz University of Hannover, Germany

**6 Joint Relay and Receive Beamforming in Cognitive Relay Networks with Hybrid Relay Strategy**
Tao Yi, Beijing University of Posts and Telecommunications, China; Li Guo, Beijing University of Posts and Telecommunications, China; and Jiaru Lin, Beijing University of Posts and Telecommunications, China

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## 7D: Channel estimation

**1 Reed-Solomon Virtual Codes Based Novel Algorithm for Sparse Channel Estimation in OFDM Systems**
Fatma Abdelkefi, Sup'com, Tunisia; Jaouhar Ayadi, ECLEXYS, Switzerland; and Fatma Abdelkefi, Sup'com, Tunisia

**2 SVD-Based Channel Estimation for MIMO Relay Networks**
Xinwei Yu, University of Alberta, Canada; and Yindi Jing, University of Alberta, Canada

**3 2-Step Frequency-Domain Channel Estimation for Training Sequence Inserted Single-Carrier Block Transmission**
Tetsuya Yamamoto, Tohoku University, Japan; and Fumiyuki Adachi, Tohoku University, Japan

**4 Low Complexity Fast LMMSE-based Channel Estimation for OFDM Systems in Frequency Selective Rayleigh Fading Channels**
Shibo Hou, Beijing University of PostsTelecommunications, China; and Jiamo Jiang, Beijing University of Posts and Telecommunications, China

**5 Parametric Least Squares Estimation for Nonlinear Satellite Channels**
Lei Xiao, EURECOM, France; and Laura Cottatellucci, EURECOM, France

**6 Training Sequence Design for Channel Estimation with Nonlinear OQPSK-Type Modulations**
Rui Rodrigues, IT - Instituto de Telecomunicações/ISCTE - Instituto Universitário de Lisboa, Portugal; Rui Dinis, IT - Instituto de Telecomunicações/FCT - Universidade Nova de Lisboa, Portugal; and Francisco Cercas, IT - Instituto de Telecomunicações/ISCTE - Instituto Universitário de Lisboa, Portugal

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## 7E: VANETs

**1 Autonomous TDMA Alignment for VANETs**
Mohamed Mustafa, Chalmers University of Technology, Sweden; Marina Papatriantafilou, Chalmers University of Technology, Sweden; Elad Michael Schiller, Chalmers University of Technology, Sweden; Amir Tohidi, Chalmers University of Technology, Sweden; and Philippas Tsigas, Chalmers University of Technology, Sweden

**2 Hybrid Position-based and DTN Forwarding in Vehicular Ad Hoc Networks**
Lei Zhao, Beijing Institute of Technology, China; Fan Li, Beijing Institute of Technology, China; and Yu Wang, University of North Carolina at Charlotte, United States

**3 Fair Buffer Allocation Scheme for Integrated Wireless Sensor and Vehicular Networks using Markov Decision Processes**
Sheheryar Arshad, University of Eng. and Tech. Lahore, Pakistan; Muhammad Murtaza, University of Eng. and Tech. Lahore, Pakistan; and Muhammad Tahir, University of Eng. and Tech. Lahore, Pakistan

**4 Evaluation of VeMAC for V2V and V2R Communications Under Unbalanced Vehicle Traffic**
Hassan Aboubakr Omar, University of Waterloo, Canada; Weihua Zhuang, University of Waterloo, Canada; and Li Li, Communications Research Center, Canada

**5 Available Bandwidth-aware Routing in UrbanVehicular Ad-hoc Networks**
Carolina Tripp Barba, Universitat Politecnica de Catalunya (UPC), Spain; Ahmad Mohamad Mezher, Universitat Politecnica de Catalunya (UPC), Spain; Monica Aguilar Igartua, Universitat Politecnica de Catalunya (UPC), Spain; Isabelle Guerin-Lassous, Universite Claude Bernard, Lyon 1, LIP (UMR ENS Lyon - INRIA - CNRS - UCBL), France; and Cheikh Sarr, Universite de Thies, Senegal

**6 Condition of Constant Frequency of RICIAN Channel Variation Achieved During Inter-Vehicular Communication**
Muhammad Adeel, University of EngineeringTechnology Peshawar, Pakistan; Sahibzada Ali Mahmud, University of EngineeringTechnology Peshawar, Pakistan; and Gul Muhammad Khan, University of Engineering and Technology Peshawar, Pakistan

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## 7F: Spectrum Sensing

**1 Joint Spectrum Sensing and Power Allocation Algorithm for Spectrum Efficiency Optimization in Ultra Wideband Cognitive Radio Networks**
Liaoyuan Zeng, Intelligent Visual Information Processing and Communication Lab, University of Electronic Science and Technology of China, China; and Sean McGrath, Wireless Access Research Centre, University of Limerick, Ireland

**2 Analysis of Multiband Sensing-Time Joint Detection Framework for Cognitive Radio Systems**
Salma Zaineb Farooq, National University of Sciences and Technology, Pakistan; and Abdul Ghafoor, National University of Sciences and Technology, Pakistan

**3 A High-Efficiency Resource Allocation Scheme under the Interference Constraints in Cognitive Radio**
hong du, Beijing University of PostsTelecommunications, China; zaixue wei, Beijing University of PostsTelecommunications, China; yu wang, Beijing University of PostsTelecommunications, China; and dacheng yang, Beijing University of Posts and Telecommunications, China

**4 Analysis of Multiband Joint Detection Framework for Waveform-based Sensing in Cognitive Radios**
Maria Iqbal, National University of Sciences and Technology, Islamabad, Pakistan; and Abdul Ghafoor, National University of Sciences and Technology, Islamabad, Pakistan

**5 Automatic Modulation Classification for MIMO Systems Using Fourth-Order Cumulants**
Michael S. Mühlhaus, Karlsruhe Institute of Technology, Germany; Mengüc Öner, Isik University, Sile, Turkey; Octavia A. Dobre, Memorial University, St. John's, Canada; Holger U. Jäkel, Karlsruhe Institute of Technology, Germany; and Friedrich K. Jondral, Karlsruhe Institute of Technology, Germany

**6 An Efficient Spectrum Sensing Method based on Analog-to-Information Converter**
Wei-Chieh Huang, Industrial Technology Research Institute, Taiwan; Chia-Lung Tsai, Industrial Technology Research Institute, Taiwan; and Jen-Yuan Hsu, Industrial Technology Research Institute, Taiwan

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## 7G: Cooperation with Limited Feedback

**1 Channel Measurement and Channel Quality Reporting in LTE-Advanced Relaying Systems**
Su Yi, NEC Laboratories, China, China; Yu Zhang, NEC Laboratories, China, China; Zhennian Sun, NEC Laboratories, China, China; and Ming Lei, NEC Laboratories, China, China

**2 Downlink Scheduling in Network MIMO Using Two-Stage Channel State Feedback**
Li-Chuan Tseng, Xin Jin, Abdelwaheb Marzouki, Institut Mines-Telecom, Telecom SudParis, France; and ChingYao Huang, National Chiao-Tung University, Hsinchu, Taiwan

**3 Effect of Outdated CSI on the Performance of Opportunistic Relaying with ARQ**
Jinhyun Park and Jae Hong Lee, Seoul National University, Korea, Republic of

**4 Backhaul Constraint-based Cooperative Interference Management for In-building Dense Femtocell Networks**
Jiming Chen, Ranplan Wireless Network Design Ltd, United Kingdom; Jimin Liu, Ranplan Wireless Network Design Ltd, United Kingdom; Peng Wang, University of Bedfordshire, Luton, United Kingdom; and Jie Zhang, University of Sheffield, United Kingdom

**5 Performance Analysis of Distributed Beamforming in a Spectrum Sharing System**
Liang Yang, Jinan University, China; Mohamed-Slim Alouini, KAUST, Saudi Arabia; and Khalid Qaraqe, Texas A&M University at Qatar, Qatar

**6 Efficient Detection and Quantization Requirements for the Uplink of Base Station Cooperation Systems**
Filipe Casal Ribeiro, ISCTE-IUL, Portugal; Rui Dinis, IT - Instituto de Telecomunicações, Portugal; Francisco Cercas, IT - Instituto de Telecomunicações, Portugal; and Adão Silva, Universidade de Aveiro, Portugal

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## 7P: Wireless Networks Posters

**1 Efficient IP Mobility Management for Green Optical and Wireless Converged Access Networks**
S.H. Shah Newaz, Raja Usman Akbar, JunKyun Choi, University of Manouba, Tunisia; Gyu Myoung Lee and Noël Crespi, Institut Mines-Telecom, Telecom Sudparis, France

**2 Automatic Neighbor Relation Penetration Probability Prediction**
Yingzhe Li, Li Ji and Li Yang, Huawei, China

**3 Resource Allocation and Routing in MIMO-WPM Cognitive Radio Ad-Hoc Networks**
Xin Jin, Abdelwaheb Marzouki,; Djamal Zeghlache, Institut Mines-Telecom, Telecom SudParis, France; and Mathew Goonewardena, Institut national de la recherche scientifique (INRS), Canada

**4 Resource Management in 4G Wireless Communications at Vehicular Speeds: A Game Theory Solution**
Iftekhar Ahmad and Daryoush Habibi, Edith Cowan University, Australia

**5 Zero configuration adaptive paging (zCap)**
Per Kreuger, Daniel Gillblad, Swedish Institute of Computer Science (SICS), Sweden; and Åke Arvidsson, Ericsson AB, Sweden

**6 Secrecy Capacity of Space Keying with Two Antennas**
Sinan Sinanovic, University of Edinburgh, United Kingdom; Nikola Serafimovski, University of Edinburgh, United Kingdom; Marco Di Renzo, French National Centre for Scientific Research (CNRS), Ecole Superieure d'Electricite, France; and Harald Haas, University of Edinburgh, United Kingdom

**7 On the security of UWB secret key generation methods against deterministic channel prediction attacks**
Sana Tmar-Ben Hamida, Jean-Benoît Pierrot, Benoît Denis, CEA-LETI, Minatec Campus, France; Claude Castelluccia, INRIA Rhône-Alpes, France; and Bernard Uguen, IETR-UMR 6164, Université de Rennes 1, France

**8 Design and Quantitative Assessment of a Novel Hybrid Cloud Architecture for VANET Simulations**
Hector Agustin Cozzetti, Istituto Superiore Mario Boella, Italy; Giuseppe Caragnano, Istituto Superiore Mario Boella, Italy; Klodiana Goga, Istituto Superiore Mario Boella, Italy; Daniele Brevi, Istituto Superiore Mario Boella, Italy; Olivier Terzo, Istituto Superiore Mario Boella, Italy; and Riccardo Scopigno, Istituto Superiore Mario Boella, Italy

**9 The GTCF Method for Exact Analysis of Multihop AF Relaying Systems**
Norman Beaulieu, University of Alberta, Canada; and Samy Soliman, University of Alberta, Canada

**10 Pareto Optimal Power Control Scheduling for OFDMA Networks**
Harald Burchardt, University of Edinburgh, United Kingdom; Sinan Sinanovic, University of Edinburgh, United Kingdom; Gunther Auer, DOCOMO Euro-Labs, Germany; and Harald Haas, University of Edinburgh, United Kingdom

**11 Optimization of Scheduling and Routing in Wireless Ad-Hoc Networks Using Cubic Games**
Ebrahim Karami, Memorial University of Newfoundland, Canada; and Savo Glisic, University of Oulu, Finland

**12 Spectral Efficiency and Fairness Tradeoffs in Cellular Networks with Realtime and Nonrealtime Traffic Mix using Stochastic Petri Nets**
Rainer Schoenen, Akram Bin Sediq, Halim Yanikomeroglu, University of Manouba, Tunisia; Gamini Senarath, Zhijun Chao and Ho Ting Cheng, Huawei Technologies, Canada

**13 Dual Type Communication Range Recognition Method(D-CRR) for Indoor Position Estimation of Passive RFID Tags**
Yuki Oda, Kansai University, Japan; Atsuki Inada, Kansai University, Japan; Emi Nakamori, Kansai University, Japan; Manato Fujimoto, Kansai University, Japan; Tomotaka Wada, Kansai University, Japan; Kouichi Mutsuura, Shinshu University, Japan; and Hiromi Okada, Kansai University, Japan

**14 Resource allocation for Multicast Services with Joint FGS Video Coding and UEP RS Coding Scheme in Single Frequency Networks**
Lei Chen and Xiaoxiang Wang, Beijing University of Posts and Telecommunications, China

**15 Performance evaluation of dual carrier feature in the uplink of HSPA+ systems**
Amal Abdel Razzac, Lebanese University, Lebanon; Salah Eddine Elayoubi, Ammar El Falou, Orange Labs, France; and Bachar El Hassan, Lebanese University, Lebanon

**16 BEP and Throughput Analysis of Incremental Selective Relaying in DS-CDMA Systems**
Hela Hakim, Universite de Quebec a Montreal, Canada; Hatem Boujemaa, Carthage University, Higher School of Communication of Tunis, Tunisia; and Wessam Ajib, Universite de Quebec a Montreal, Canada

**17 Coalition Network Elements for Base Station Cooperation**
Jie Zhang, SCIE, UESTC, China; Rong Zhang, Univ. of Southampton, United Kingdom; Guangjun Li, SCIE, UESTC, China; and Lajos Hanzo, Univ. of Southampton, United Kingdom

**18 Exact Analytical Solution for Dual-Hop and Opportunistic Dual-Hop AF Relaying Systems**
Samy Soliman and Norman Beaulieu, University of Alberta, Canada

**19 Channel- and delay-aware scheduling and packet dropping for real time traffic over WiMAX networks**
Rudzidatul Dziyauddin, Dritan Kaleshi and Angela Doufexi, University of Bristol, United Kingdom

**20 Distributed Resource Allocation Scheme for Multicell OFDMA Networks Based on Combinatorial Auction**
Seyed Mohamad Alavi, Illinois Institute of Technology, United States; Chi Zhou, Illinois Institute of Technology, United States; and Wan Wang Gen, Shanghai University, China

**21 Multitone Jamming Rejection of Frequency Hopped OFDM Systems in Wireless Channels**
Arafat Al-Dweik, Khalifa University, United Arab Emirates; and Abdallah Shami, Western University, Canada

**22 Mobile Relay Based Fast Handover Scheme in High-Speed Mobile Environment**
Qing Huang, Jianmei Zhou, Cheng Tao, Beijing Jiaotong University, China; Su Yi, NEC laboratories, China; and Ming Lei, NEC laboratories, China

**23 AHP-based Relay Selection Protocol for Flexible Resource Management**
Inchul Yoo, Korea Advanced Institute of Science and Technology (KAIST), Korea, Republic of; Yeejung Kim, LG Electronics, Korea, Republic of; Jinyoung Oh and Youngnam Han, Korea Advanced Institute of Science and Technology (KAIST), Korea, Republic of

**24 SecAT-Dist: A Novel Secure AT-Dist Localization Scheme for Wireless Sensor Networks**
Amal Abdelkarim, University of Manouba, Tunisia; Abderrahim Benslimane, University of Avignon, France; Issam Mabrouki and Abdelfettah Belghith, University of Manouba, Tunisia

**25 On the Performance of Relay Selection in Cognitive Radio Networks**
Zoubeir Mlika, Wessam Ajib, Universite de Quebec a Montreal, Canada; Wael Jaafar and David Haccoun, Ecole Polytechnique de Montreal, Canada

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## 8A: HetNet II

**1 A Dynamic Resource Assignment Method for Uncoordinated Wireless Networks**
Serkan Uygungelen and Zubin Bharucha, DOCOMO Euro-Labs, Germany

**2 Inter Technology Load Balancing Algorithm for Evolved Packet System**
Marek Skowron, University of Oulu, Finland; Suneth Namal, University of Oulu, Finland; Jani Pellikka, University of Oulu, Finland; and Andrei Gurtov, University of Oulu, Finland

**3 Small Cells – Effective Capacity Relief Option for Heterogeneous Networks**
Michael Hughes, Crown Castle, United States; and Vladan Jovanovic, Newfield Wireless, United States

**4 Flexible Spectrum Sharing and Interference Coordination for Low Power Nodes in Heterogeneous Networks**
Carlo Galiotto, Nicola Marchetti and Linda Doyle, CTVR, Trinity College, Dublin, Ireland

**5 Radio Resource Allocation for Single-network and Multi-homing Services in Heterogeneous Wireless Access Medium**
Muhammad Ismail, University of Waterloo, Canada; Weihua Zhuang, University of Waterloo, Canada; and Ming Yu, Com Dev, Canada

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## 8B: Channel Characterization and Modeling

**1 Effect of antenna type on the capacity ofbody-to-body capacity when using uniformpower allocation**
Khalida Ghanem, CDTA, Algeria

**2 Characterization of large-scale fading for the 2.4 GHz channel in obstacle-dense indoor propagation topologies**
Theofilos Chrysikos, University of Patras, Greece; and Stavros Kotsopoulos, University of Patras, Greece

**3 5 GHz Intra-Vehicle Channel Characterization**
David Matolak, Ohio University, United States

**4 Modeling of Vehicle-to-Vehicle Channels in the Presence of Moving Scatterers**
Alireza Borhani and Matthias Paetzold, University of Agder, Norway

**5 A Generalized Analysis of Three-Dimensional Anisotropic Scattering in Mobile Wireless Channels-Part II: Second-Order Statistical Characterization**
Petros Karadimas, University of Bedfordshire, United Kingdom; and Jie Zhang, University of Sheffield, United Kingdom

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## 8C: WSN Design and Deployment

**1 Censoring for Type-Based Multiple Access Scheme in Wireless Sensor Networks**
Mohammed Karmoose, Alexandria University, Egypt; Karim Seddik, American University in Cairo, Egypt; and Hassan El Kamchouchi, Alexandria University, Egypt

**2 Redeployment of Randomly Deployed Wireless Mobile Sensor Nodes**
Khalil Mougou, ENSI, Tunisia; Saoucene Mahfoudh, Telecom SudParis, France; Pascale Minet, INRIA, France; and Anis Laouiti, Telecom SudParis, France

**3 Dynamic Sensors Selection for Overlapped Multiple-Target Tracking using Eagerness**
Farzaneh Razavi Armaghani, Iqbal Gondal and Joarder Kamruzzaman, Monash University, Australia

**4 Throughput maximization for a wireless energy harvesting node considering the circuitry power consumption**
Maria Gregori, CTTC, Spain; and Miquel Payaró, CTTC, Spain

**5 Movement Direction Based Path Selection Strategy in Converged Cellular and Wireless Sensor Networks**
Zhenhong Li, Renesas Mobile Corporation, China; Haifeng Wang, Renesas Mobile Corporation, China; Jingfeng Qu, University of Tongji, China; Fei Yin, Renesas Mobile Corporation, China; FuQiang Liu, University of Tongji, China; and Ping Wang, University of Tongji, China

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## 8D: Cooperation in LTE

**1 Experimental Evaluation of Reference Signal Interference Canceller for Multi-BS Cooperative Transmission Control in LTE**
Atsushi Nagate, Daigo Ogata and Teruya Fujii, Softbank Mobile, Japan

**2 Uplink Coordinated Scheduling Based on Resource Sorting**
Gaofeng Cui, Sixing Lu, Weidong Wang, Yinghai Zhang, Chaowei Wang and Xiuhua Li, Beijing University of Posts and Telecommunications, China

**3 Performance Evaluation and Analysis on Group Mobility of Mobile Relay for LTE Advanced System**
Wenyu Li, Chao Zhang, Xiaoyu Duan, Shucong Jia, Yu Liu and Lin Zhang, Beijing University of Posts and Telecommunications, China

**4 Low-Complexity Channel Estimation for CoMP Multi-user Systems**
Xin Wang, Xiaohui Li and Yongqiang Hei, Xidian University, China

**5 Throughput Analysis for Multi-Point Joint Transmission with Quantized CSI Feedback**
Behrooz Makki, Jingya Li, Thomas Eriksson and Tommy Svensson, Chalmers University of Technology, Sweden

*Thursday 6 September 2012 14:00-15:30 206B*

## 8E: Intelligent Transportation Systems

**1 Energetic Optimization of the Driving Speed based on Geographic Information System Data**
Sousso Kelouwani, UQTR, Canada; Kodjo Agbossou, UQTR, Canada; Yves Dubé, UQTR, Canada; and Loic Boulon, UQTR, Canada

**2 Context-Aware Mobile Intelligent Transportation Systems**
Minh Quang Tran, Shibaura Institute of Technology, Japan; Muhammad Ariff Baharudin, Shibaura Institute of Technology, Japan; and Eiji Kamioka, Shibaura Institute of Technology, Japan

**3 Robust Traffic Assignment in Transportation Networks Using Network Criticality**
Agop Koulakezian, Hazem Soliman, Tang Tang and Alberto Leon-Garcia, University of Toronto, Canada

**4 Effects of ACC and FCW on Speed, Fuel Consumption, and Driving Safety**
Mohamed Benmimoun, Andreas Pütz, Adrian Zlocki and Lutz Eckstein, Institut für Kraftfahrzeuge, RWTH Aachen University, Germany

**5 Priority Management of Emergency Vehicles at Intersections Using Self-organized Traffic Control**
Wantanee Viriyasitavat and Ozan Tonguz, Carnegie Mellon University, United States

*Thursday 6 September 2012 14:00-15:30 2104A*

## 8F: Space-time Coding

**1 Collision Warning System in Dynamic Cooperative Environment with Alamouti STBC Algorithm**
Chirag Warty, University of Illinois Chicago, United States; and Richard Wai Yu, NAVSEA, United States

**2 An Improved Detection Scheme for Distributed IDM-STCs in Relay-Systems**
Florian Lenkeit, University of Bremen, Germany; Dirk Wübben, University of Bremen, Germany; and Armin Dekorsy, University of Bremen, Germany

**3 Power Allocation in Cooperative Space-Time Coded Wireless Relay Networks**
Aasem N. Alyahya, King Saud University, Saudi Arabia; and Jacek Ilow, Dalhousie University, Canada

**4 Decoding of Distributed Alamouti STBC in DF Based Cooperative System**
Ankur Bansal, Manav R. Bhatnagar, Indian Institute of Technology Delhi, India; and Are Hjørungnes, University of Oslo, Norway

**5 Experimental Verification of PER Performance of STBC-based Multi-hop Cooperative Relaying**
Makoto Miyagoshi, Hidekazu Murata, Susumu Yoshida, Koji Yamamoto, Kyoto University, Japan; Daisuke Umehara, Kyoto Institute of Technology, Japan; Satoshi Denno, Okayama University, Japan; and Masahiro Morikura, Kyoto University, Japan

*Thursday 6 September 2012 14:00-15:30 208AB*

## 8G: Energy Efficiency

**1 Energy Efficiency and Optimal Power Allocation in Virtual-MIMO Systems**
Jing Jiang, University of Surrey, United Kingdom; Mehrdad Dianati, University of Surrey, United Kingdom; Muhammad Imran, University of Surrey, United Kingdom; and Yan Chen, Huawei Technologies, Co. Ltd., China

**2 On the Energy Efficiency of Hybrid Relaying Schemes in the Two-way Relay Channel**
Yinan Qi, University of Surrey, United Kingdom; Muhammad Ali Imran, University of Surrey, United Kingdom; and Rahim Tafazolli, University of Surrey, United Kingdom

**3 Collaborative Relay-based Multiuser Beamforming in Cellular Systems**
Chen Chen, State Key Laboratory of Advanced Optical Communication Systems and Networks, School of Electronics E, China; Lin Bai, School of Electronic and Information Engineering, Beihang University, China; Da Wang, State Key Laboratory of Advanced Optical Communication Systems and Networks, School of Electronics E, China; Ye Jin, State Key Laboratory of Advanced Optical Communication Systems and Networks, School of Electronics E, China; and Jinho Choi, Swansea University, United Kingdom

**4 On the Energy Efficiency-Spectral EfficiencyTrade-Off of the 2BS-DMIMO System**
Oluwakayode Onireti, Fabien Heliot and Muhammad Imran, University of Surrey, United Kingdom

**5 Energy Efficient Comparison between Distributed MIMO and Co-located MIMO in the Uplink Cellular Systems**
Chunlong He, Bin Sheng, Pengcheng Zhu, and Xiaohu You, SoutheastUniversity, China

*Thursday 6 September 2012 14:00-15:30 2000C*

## 8P: Multiple Access Posters

**1 Achievable Net-Rates in Multi-User OFDMA with Partial CSI and Finite Channel Coherence**
Peter Rost, NEC Laboratories Europe, Germany

**2 Model Predictive Zooming Power Control in Future Cellular Systems Under Coarse Quantization**
Mauricio Cea, University of Newcastle, Australia; Graham Goodwin, University of Newcastle, Australia; and Torbjorn Wigren, Ericsson AB, Sweden

**3 Self-optimization of Downlink Transmission Power in 3GPP LTE-A Heterogeneous Network**
Yupeng Wang, Dongyao Wang, Jiyong Pang and Gang Shen, Alcatel-Lucent Shanghai Bell Co. Ltd., China

**4 Bargaining Solutions for Multicast Subgroup Formation in LTE**
Leonardo Militano, Massimo Condoluci, Giuseppe Araniti and Antonio Iera, University Mediterranea of Reggio Calabria, Italy

**5 A MU-MIMO CQI estimation method for MU-MIMO UEs in LTE systems**
Hung T. Nguyen, Aalborg University, Denmark; and Istvan Kovacs, Nokia Siemens Networks, Denmark

**6 Link Adaptation Control in LTE Uplink**
Pierre Bertrand, Texas Instruments Inc, France; Anthony Ekpenyong, Texas Instruments Inc, United States; and Jing Jiang, Texas Instruments Inc, United States

**7 A Simple Scheduling Restriction Scheme for Interference Coordinated Networks**
Moo Ryong Jeong, DOCOMO Innovations, Inc., United States; and Nobuhiko Miki, NTT DOCOMO, INC., Japan

**8 On the Dependence between FPC and ICIC in SC-FDMA Cellular Systems**
Javier Lafuente-Martínez, Ángela Hernández-Solana and Antonio Valdovinos, University of Zaragoza, Spain

**9 Distributed Resource Allocation with Inter-cell Interference Coordination in OFDMA Uplink**
Shuhui Liu, Yongyu Chang and Dacheng Yang, Beijing University of Posts and Telecommunications, China

**10 A Proposal for Radio Resource Allocation of TDM Inter-Cell Interference Coordination to Heterogeneous Networks with Pico Cells in LTE-Advanced**
Noriaki Miyazaki, Xiaoqiu Wang, Masashi Fushiki, Yosuke Akimoto and Satoshi Konishi, KDDI R&D Laboratories Inc., Japan

**11 MAI and MI Performance of the Orthogonal Complementary Code Based DS-BPAM UWB System**
Zhiquan Bai, Fang Zhao, Yongjie Xu, Dongfeng Yuan and Kyungsup Kwak, Inha University, South Korea

**12 Efficient Paging Control for Carrier Aggregation in LTE-A System**
Chie Ming Chou and Ching Yao Huang, NCTU, Taiwan

**13 Impact of Backhaul Subframe Misalignment on Uplink System Performance of LTE-Advanced Relay Networks**
Ömer Bulakci, Nokia Siemens Networks, Germany; Andrei Stefan Nedelcu, Technische Universität München (TUM), Germany; Abdallah Bou Saleh, Aalto University School of Electrical Engineering, Finland; Simone Redana, Nokia Siemens Networks, Germany; and Jyri Hämäläinen, Aalto University School of Electrical Engineering, Finland

**14 Joint Utility Maximization in Two-tier Networks by Distributed Pareto-Optimal Power Control**
Duy Ngo, McGill University, Canada; Long Le, Institut National de la Recherche Scientifique (INRS-EMT), Universite du Quebec, Canada; and Tho Le-Ngoc, McGill University, Canada

**15 Performance Analysis and Parameter Optimization of Random Access Backoff Algorithm in LTE**
Xiao-Bin Yang, University of Calgary, Canada; Abraham Fapojuwo, University of Calgary, Canada; and Emeka Egbogah, University of Calgary, Canada

**16 Performance of Power Saving Modes in IEEE 802.16e System**
Fuad M. Abinader Jr., Instituto Nokia de Tecnologia (INdT), Brazil; Vicente A. de Souza Jr., Universidade Federal do Rio Grande do Norte (UFRN), Brazil; Anderson S. B. Fernandes, Universidade Federal do Rio Grande do Norte (UFRN), Brazil; Adaildo G. D'Assunção, Universidade Federal do Rio Grande do Norte (UFRN), Brazil; Nibia S. Bezerra, GTEL - UFC, Brazil; and Pekko Orava, Nokia, Finland

**17 A Novel QoE-Based Carrier Scheduling Scheme in LTE-Advanced Networks with Multi-Service**
Fei Liu, Beijing University of Posts & Telecommunications, China; Wei Xiang, University of Southern Queensland, Australia; Yueying Zhang, Beijing University of Posts & Telecommunications, China; Kan Zheng, Beijing University of Posts & Telecommunications, China; and Hui Zhao, Beijing University of Posts & Telecommunications, China

**18 Fast Adaptive S-ALOHA Scheme for Event-driven Machine-to-Machine Communications**
Huasen Wu, Beihang University, China; Chenxi Zhu, University of Maryland, United States; Richard La, University of Maryland, United States; Xin Liu, University of California, Davis, United States; and Youguang Zhang, Beihang University, China

**19 Subchannel and Transmission Mode Scheduling for D2D Communication in OFDMA Networks**
Min-Hong Han, Yonsei University, South Korea; Byung-Gook Kim, Yonsei University, South Korea; and Jang-Won Lee, Yonsei University, South Korea

**20 Scheduling for Frequency Hopped Access with Randomized Frame Lengths**
Bill Kiki-Sagbe and François Gagnon, LACIME-ÉTS-Montréal, Canada

**21 A Hybrid Approach of Time-Frequency Domain Interference Coordination for QoS Guarantee in Macro-Femto Co-channel Deployment**
Zhenguo Du, USTC, China; Peilin Hong, USTC, China; Kaiping Xue, USTC, China; and Hao Tang, USTC, China

**22 Study of the Degree of Fairness for a Parallel Relay 2-hop OFDMA Virtual Cellular Network**
Gerard J. Paraison and Eisuke Kudoh, Tohoku Institute of Technology, Japan

**23 Resource Allocation for Downlink OFDMA Relay Networks with Imperfect CSI**
Jaeho Lee, LG Electronics, Inc., South Korea; Hanmok Shin, Seoul National University, South Korea; and Jae Hong Lee, Seoul National University, South Korea

**24 Study on The Uplink Sum Capacity of Single Cell Cellular Systems With Minimum SINR Constraint**
Qiuping Huang, Beijing University of Posts and Telecommunications, China; Xiaofeng Liu, China Academy of Telecommunications Research, MITT, China; and Hongwen Yang, Beijing University of Posts and Telecommunications, China

**25 DownLink Resource Allocation for LTE-Advanced networks with Type1 Relay Nodes**
ZhuYan Zhao, Jian Wang, Nokia Siemens Networks, China; Simone Redana and Bernhard Raaf, Nokia Siemens Networks, Germany

**26 Cross-Layer Handoff Design in Communication-Based Train Control (CBTC) Systems Using WLANs**
Li Zhu, Beijing Jiaotong University, China; F. Richard Yu, Carleton University, Canada; Bin Ning, Tao Tang and Hongwei Wang, Beijing Jiaotong University, China

**27 A Novel Opportunistic Scheduling Algorithm in Coordinated Multi-Point Transmission Scenario**
Hao Wang, Zhihang Li, Nan Liu, Zhiwen Pan and Xiaohu You, Southeast University, China

**28 Dynamic Load Balancing in 3GPP LTE Multi-Cell Fractional Frequency Reuse Networks**
Zhihang Li, Hao Wang, Zhiwen Pan, Nan Liu and Xiaohu You, Southeast University, China

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***Thursday 6 September 2012 16:00-17:30 2103***

## 9A: Femto II

**1 Heterogeneous Deployment to Meet Traffic Demand in a Realistic LTE Urban Scenario**
Claudio Coletti, Aalborg University, Denmark; Huan Nguyen, Aalborg University, Denmark; Liang Hu, Aalborg University, Denmark; István Kovács, Nokia Siemens Networks, Denmark; Benny Vejlgaard, Nokia Siemens Networks, Denmark; Ralf Irmer, Vodafone Group, United Kingdom; and Neil Scully, Vodafone Group, United Kingdom

**2 Pareto Optimal SINR Scheduling for Femto-cell Deployment in Wireless Networks**
Harald Burchardt, University of Edinburgh, United Kingdom; Sinan Sinanovic, University of Edinburgh, United Kingdom; Gunther Auer, DOCOMO Euro-Labs, Germany; and Harald Haas, University of Edinburgh, United Kingdom

**3 Hybrid Access Design for Femtocell Networks With Dynamic User Association and Power Control**
Vu Ha and Long Le, INRS-EMT, University of Quebec, Canada

**4 An MDP-Based Handover Decision Algorithm in Hierarchical LTE Networks**
Jun Pan and Wenyi Zhang, University of Science and Technology of China, China

**5 Overload Control for Machine Type Communications with Femtocells**
Ang-Hsun Tsai, Li-Chun Wang, Jane-Hwa Huang, National Chi Nan University (NCNU), Taiwan; and Tzu-Ming Lin, Industrial Technology Research Institute (ITRI), Taiwan

*Thursday 6 September 2012 16:00-17:30 207*

## 9B: PHY/MAC for Ad Hoc Networks

**1 T-TMAC: Energy Aware Sensor MAC Protocol for Health-care Monitoring**
Youssouf Zatout, Eric Campo, and Jean-François Llibre, CNRS, France

**2 Spatial Multiplexing with Opportunistic Multiuser Scheduling in Ad Hoc Networks**
Xianling Wang, Jian Geng, Xin Zhang and Dacheng Yang, Beijing University of Posts and Telecommunications, China

**3 Collision-Balancing Frequency Hopping in Single-Hop Mobile Ad Hoc Networks**
Ralph Tanbourgi, Karlsruhe Institute of Technology, Germany; Xevi Pujol i Molist, Technical University of Catalonia (UPC), Spain; and Friedrich K. Jondral, Karlsruhe Institute of Technology, Germany

**4 Event-driven MAC Protocol For Dual-Radio Cooperation**
Arash Khatibi, Research Asistant, United States; Yunus Durmus, PhD student in Embedded Software Group, Netherlands; and Ertan Onur, Asistant Prof at Embedded Software Group, Netherlands

**5 BER Analysis with an Appropriate Friis Formula for Multi-hop ALOHA Dense Ad Hoc Networks**
Pabblo Ghobad, University of Brasília (UnB), Brazil; and Renato Moraes, University of Brasília (UnB), Brazil

*Thursday 6 September 2012 16:00-17:30 2105*

## 9C: Equalization

**1 Pilot-Aided Equalization with a Constrained Noise-Estimation Filter**
Maurizio Magarini, Politecnico di Milano, Italy; Arnaldo Spalvieri, Politecnico di Milano, Italy; and Luca Barletta, Politecnico di Milano, Italy

**2 Iterative Frequency Domain Equalization for Single Carrier Signals with Magnitude Modulation Techniques**
Marco Gomes, Instituto de Telecomunicações, DEEC-Univ. de Coimbra, Portugal; Rui Dinis, Instituto de Telecomunicações, FCT-UNL, Portugal; Vitor Silva, Instituto de Telecomunicações, DEEC - Universidade de Coimbra, Portugal; Francisco Cercas, Instituto de Telecomunicações, ISCTE-IUL, Portugal; and Martin Tomlinson, University of Plymouth, United Kingdom

**3 Frequency-Domain Scrambling Differential Detection and Equalization for DFT Scrambling Vector OFDM System**
Gao Zhou, Southwest Jiaotong University, China; Pingzhi FAN, Southwest Jiaotong University, China; and Li HAO, Southwest Jiaotong University, China

**4 A Pragmatic Design of Frequency-Domain Equalizers for Offset Modulations**
Miguel Luzio, FCT - Universidade Nova de Lisboa, Portugal; Rui Dinis, IT - Instituto de Telecomunicações, Portugal; and Paulo Montezuma, UNINOVA - Instituto de Desenvolvimento de Novas Tecnologias, Portugal

**5 Frequency-Domain Turbo Equalisation in Coded SC-FDMA Systems: EXIT Chart Analysis and Performance**
Jiayi Zhang, Lie-Liang Yang and Lajos Hanzo, University of Southampton, United Kingdom

*Thursday 6 September 2012 16:00-17:30 2101*

## 9D: OFDM

**1 Optimum and Sub-Optimum Receivers for OFDM Signals with Iterative Clipping and Filtering**
João Guerreiro, FCT, Portugal; Rui Dinis, Instituto de Telecomunicações, Portugal; and Paulo Carvalho, FCT, Portugal

**2 Iterative Intercarrier Interference Mitigation for Pilot-Aided OFDM Channel Estimation Based on Channel Linearizations**
Ingmar Groh, Intel Mobile Communications, Germany; Christian Gentner and Stephan Sand, German Aerospace Center (DLR), Germany

**3 Multi-User Aware Frame Structure for OFDMA Based System**
Alphan Sahin and Huseyin Arslan, University of South Florida, United States

**4 Subcarrier Power Allocation in OFDM with Low Precision ADC at Receiver**
Tapan Shah and Onkar Dabeer, Tata Institute of Fundamental Research, India

**5 Performance Evaluation of DFT-Spread OFDM and DCT-Spread OFDM for Underwater Acoustic Communication**
Prashant Kumar and Preetam Kumar, Indian Institute of Technology Patna, India

*Thursday 6 September 2012 16:00-17:30 206B*

## 9E: Power Control I

**1 Base-Station Duty-Cycling and traffic buffering as a means to achieve Green Communications**
Rohit Gupta and Emilio Calvanese Strinati, CEA-LETI, France

**2 Optimization of Discontinuous Reception (DRX) for Mobile Internet Applications over LTE**
Ali Taha Koc, Satish Chandra Jha and Rath Vannithamby, Intel Corporation, United States

**3 Uplink interference protection as a non-cooperative game over OFDMA networks**
Rodrigo A. Vaca Ramirez, The University of Edinburgh, United Kingdom; John Thompson, The University of Edinburgh, United Kingdom; and Victor M. Ramos R., Universidad Autonoma Metropolitana (UAM), Mexico

**4 A Novel Power Ramping Scheme of M2M for WCDMA Random Access Channel**
Lingling Xu, Hui Tian, Ziqiang Liu, Yao Huang, Key Laboratory of Universal Wireless Communications, Ministry of Education, Wireless Technology Innovation Institute, WTI, Beijing University of Posts and Telecommunications, China; and Haidong Yan, Huawei Technologies Co., Ltd., China

**5 LTE UE Power Consumption Model - For System Level Energy and Performance Optimization**
Anders Riis Jensen, Aalborg University, Denmark; Mads Lauridsen, Aalborg University, Denmark; Preben Mogensen, Aalborg University, Denmark; Troels B. Sørensen, Aalborg University, Denmark; and Per Jensen, Agilent Technologies, Denmark

*Thursday 6 September 2012 16:00-17:30 2104A*

## 9F: Modulation and Detection

**1 Reduced-Complexity Soft-Decision Aided PSK Detection**
Chao Xu, University of Southampton, United Kingdom; Dandan Liang, University of Southampton, United Kingdom; Shinya Sugiura, Toyota Central R&D Labs, Japan; Soon Xin Ng, University of Southampton, United Kingdom; and Lajos Hanzo, University of Southampton, United Kingdom

**2 Near ML Modulation Classification**
Dongwoon Bai, Samsung, United States; Jungwon Lee, Samsung, United States; Sungsoo Kim, Samsung, United States; and Inyup Kang, Samsung, United States

**3 Iterative Overlap TD-QRM-ML Block Signal Detection for Single-Carrier Transmission without CP Insertion**
Hideyuki Moroga, Tohoku University, Japan; Tetsuya Yamamoto, Tohoku University, Japan; and Fumiyuki Adachi, Tohoku University, Japan

**4 A Low Complexity Blind Data Detector for OFDM Systems**
Yi-Syun Yang, National Taiwan University, Taiwan; Wei-Chieh Huang, Industrial Technology Research Institute, Taiwan; Chih-Peng Li, National Sun Yat-Sen University, Taiwan; and Hsueh-Jyh Li, National Taiwan University, Taiwan

**5 Optimal Amplitude Design for Pulse Position Amplitude Modulation**
Wei-Chieh Huang, Chia-Lung Tsai and Pang-An Ting, Industrial Technology Research Institute, Taiwan

***Thursday 6 September 2012 16:00-17:30 208AB***

## 9G: Power Allocation

**1 Joint Power Allocation for Coherent Downlink Coordinated Transmission**
Shiyuan Li, Beijing University of Posts and Telecommunications (BUPT), China; Qimei Cui, Beijing University of Posts and Telecommunications (BUPT), China; Harald Haas, University of Edinburgh, United Kingdom; Xiaofeng Tao, Beijing University of Posts and Telecommunications (BUPT), China; and Xin Chen, Beijing University of Posts and Telecommunications (BUPT), China

**2 QoS Aware Scheduling with Optimization of Base Station Power Allocation in Downlink Cooperative OFDMA Systems**
Xiao Zhang, Xiaoming Tao and Jianhua Lu, Tsinghua University, China

**3 Amplify-and-Forward MIMO Y Channel: Power Allocation Based Signal Space Alignment**
Yuping Su, State Key Lab of ISN, Xidian University, China; Ying Li, State Key Lab of ISN, Xidian University, China; and Jinliu Liu, Hua wei Technologies, Beijing, China

**4 Capacity and Power Allocation of Dual-Hop AF Relaying over Rayleigh Fading Channels**
Leonardo Jimenez Rodriguez, McGill University, Canada; Nghi Tran, University of Akron, United States; and Tho Le-Ngoc, McGill University, Canada

***Thursday 6 September 2012 16:00-17:30 2000C***

## 9P: Cooperative Communications Posters

**1 Degrees of Freedom of Signal Alignment forGeneralized MIMO Y Channel with General SignalDemands**
Jiaju She, Shanzhi Chen, State Key Laboratory of Networking and Switching Technology, Beijing University of Posts and Telecommunications, and State Key Laboratory of Wireless Mobile Communications, China Academy of Telecommunications Technology, China; Bo Hu, State Key Laboratory of Networking and Switching Technology, Beijing University of Posts and Telecom, China; Yingmin Wang, State Key Laboratory of Wireless Mobile Communications, China Academy of Telecommunications Technolo, China; Weiguo Ma, State Key Laboratory of Wireless Mobile Communications, China Academy of Telecommunications Technolo, China; and Xin Su, State Key Laboratory of Wireless Mobile Communications, China Academy of Telecommunications Technolo, China

**2 Joint Design of Linear Relay and Destination Processing for Two-hop MIMO Multi-relay Networks**
Youhua Fu, Nanjing University of PostsTelecommunications, China; Wei_Ping Zhu, Concordia University, Canada; and Chen Liu, Nanjing University of Posts and Telecommunications, China

**3 Distributed Auction for Self-Optimization in Wireless Cooperative Networks**
Lei Zhong, National Institute of Information and Communications Technology (NICT), Japan; Yusheng Ji, National Institute of Informatics (NII), Japan; and Noboru Sonehara, National Institute of Informatics (NII), Japan

**4 Outage Performance and DMT Analysis of DF Parallel Relaying in FSO IM/DD Communications**
Sahar Molla Aghajanzadeh, University of Waterloo, Canada; and Murat Uysal, Ozyegin University, Turkey

**5 User Pairing for Capacity Maximization in Cooperative Wireless Network Coding**
Talha Rasheed, Memorial University of Newfoundland, Canada; Mohamed Ahmed, Memorial University of Newfoundland, Canada; and Octavia Dobre, Memorial University of Newfoundland, Canada

**6 High Power Efficiency Transmission Based on Game Theory for AF Cooperative Communication**
Takuya Yamada and Tomoaki Ohtsuki, Keio University, Japan

**7 Joint Transmit/Receive MMSE-FDE for MIMO Analog Network Coding in Single-Carrier Bi-Directional Relay Communications**
Hiroyuki Miyazaki, Tohoku University, Japan; Masayuki Nakada, Tohoku University, Japan; Tatsunori Obara, Tohoku University, Japan; and Fumiyuki Adachi, Tohoku University, Japan

**8 Distributed Beamforming for Wireless Sensor Networks in Local Scattering Environments**
Slim Zaidi, INRS, Canada; and Sofiène Affes, INRS, Canada

**9 Spectral Efficiency of Distributed Antenna Network Using MIMO Spatial Multiplexing**
Shinya Kumagai, Ryusuke Matsukawa, Tatsunori Obara, Tetsuya Yamamoto and Fumiyuki Adachi, Tohoku University, Japan

**10 A Novel Network Coding Multi-User Coordinated Multipoint Downlink Transmission Scheme**
Wei Zhou, Ying Li, Yue Sun, Xidian University, China; and Dengkui Zhu, ZTE Corporation, China

**11 Threshold-Triggered Selective Phase-Forward of Differential PSK in Cooperative Communication**
Huai Tan and Paul Ho, Simon Fraser University, Canada

**12 Low Complexity Detectors for Cooperative WirelessSensor Networks**
Qasim Zeeshan Ahmed, KAUST, Saudi Arabia; Mohamed-Slim Alouini, KAUST, Saudi Arabia; and Sonia Aissa, INRS, University of Quebec, Canada

**13 Clique-based Capacity Analysis of Wireless Ad-hoc Networks with Cooperative Relaying in Multi-flow Scenario**
Salah Abdulhadi, Ryerson University, Canada; Muhammad Jaseemuddin, Ryerson University, Canada; Alagan Anpalagan, Ryerson University, Canada; and Alagan Anpalagan, Ryerson University, Canada

**14 An Interference Coordination Scheme for Device-to-Device Multicast in Cellular Networks**
Dongyu Wang, Beijing University of Posts and Telecommunications, China; Xiaoxiang Wang, Beijing University of Posts and Telecommunications, China; and Yuan Zhao, Beijing University of Posts and Telecommunications, China

**15 An Optimized Cooperative Transmission Scheme for Interference Mitigation in Heterogeneous Downlink Network**
Kai Huang, Tsinghua University, China; Songtao Lu, Beihang University, China; and Jingbo Guo, Tsinghua University, China

**16 On the Capacity Gap of Gaussian Multi-Way Relay Channels**
Moslem Noori, University of Alberta, Canada; and Masoud Ardakani, University of Alberta, Canada

# 2W: Workshop on Green Information and Communications

*Monday 3 September 2012*

**1 First Survey Results of Quantified User Behavior in User-in-the-Loop Scenarios for Sustainable Wireless Networks**
Rainer Schoenen, Carleton University, Ottawa, Canada; Gurhan Bulu, Hacettepe University, Turkey; Amir Mirtaheri, Tamer Beitelmal and Halim Yanikomeroglu, Carleton University, Ottawa, Canada

**2 Spectrum Reorganization and Bundling for Power Efficient Mobile Networks**
Gilbert Micallef, Aalborg University, Denmark; Preben Mogensen, Nokia Siemens Networks, Denmark; and Hans-Otto Scheck, Nokia Siemens Networks, Sweden

**3 Game Theory Based Power Allocation Algorithm in High-Speed Mobile Environment**
Lina Mao, Shaoyi Xu, Tianhang Fu and Qing Huang, Research Institute of Broadband Wireless Mobile Communications, School of Electronics and Information Engineering, China

**4 Distributed Energy-Saving Mechanism for Self-Organizing Femto LTE Networks**
Raymond Kwan, Ubiquisys, United Kingdom

**5 Traffic Routing Guidance Algorithm based on Backpressure with a Trade-off between User Satisfaction and Traffic Load**
Rui Zhang, Zhijun Li, Cheng Feng and Shouxu Jiang, Harbin Institute of Technology, China

**6 Combined Hop Count and Received Signal Strength Routing Protocol for Mobility-enabled WSNs**
João M. Ferro and Fernando J. Velez, Instituto de Telecomunicações, Universidade da Beira Interior, Portugal

# 3W: Workshop on Wireless World 2020

*Tuesday 4 September 2012 13:30-16:10 2104B*

## W31: Invited Talks

*Chair: Angeliki Alexiou (University of Piraeus)*

**1 Welcome and Introduction**
Nigel Jefferies, Chair WWRF

**2 How Spectrum Regulation will lose to Technology**
JeanLuc Berube, CRC President

**3 HW vision of LTE-B and 5G**
Peiying Zhu, Huawei

**4 Status and Challenges in Spectrum Sharing: Past, Today, and in 2020**
Vahid Tarokh, Harvard

**5 Network evolution Beyond 4G & Future Forum's activity**
Guan Hao, Future Forum

**6 Access Networks: Is there a difference between wireless and wireline?**
Tod Sizer, Bell Labs , Alcatel Lucent

**7 The Pros and Cons of Cooperative Communications**
Lajos Hanzo, University of Southampton

*Tuesday 4 September 2012 16:15-17:50 2104B*

## W32: Paper presentations

*Chair: Jing Yao (Huawei)*

**1 Latency-Reduced Equalizer with Model-Based Channel Estimation for Vehicle-to-Vehicle Communications**
Xin Gao, Xianbin Wang and Md. Jahidur Rahman, The University of Western Ontario, Canada

**2 User Classifying-based Hybrid Spectrum Allocation in Two-tier OFDMA Femtocell Networks**
Sainan Li, Hailun Xia, Zhimin Zeng, Zhenglei Huang and Hao Wu, Beijing University of Posts and Telecommunications, China

**3 A Compressed HARQ Feedback for Device-to-Device Multicast Communications**
Jinling Du, Shanghai Research Center for Wireless Communications, China; Wensheng Zhu, Shanghai Research Center for Wireless Communications, China; Jing Xu, Shanghai Research Center for Wireless Communications; Shanghai Institute of Microsystem and Informat, China; Zhenhong Li, Wireless Modem R&D Renesas Mobile Corporation, Finland; and Haifeng Wang, Wireless Modem R&D Renesas Mobile Corporation, Finland

**4 Utility-based Dynamic Spectrum Aggregation Algorithm in Cognitive Radio Networks**
Haeyoung Lee, Seiamak Vahid and Klaus Moessner, University of Surrey, United Kingdom

**5 Future Evolution in Wireless Network Architectures: Towards a 'Cloud of Antennas'**
Matthew Webb, Zhaojun Li, Paul Bucknell, Timothy Moulsley and Sunil Vadgama, Fujitsu Laboratories of Europe Ltd, United Kingdom

**6 Downlink Transmission Optimization Framework**
Ngọc-Dũng Đào, Aaron Callard, Hang Zhang and Ho Ting Cheng, Huawei Technologies Canada, Canada

**7 A Novel Downlink ICIC Method Based on User Position in LTE-Advanced Systems**
Dengkun Xiao, Beijing Institute, Huawei Technologies Co., Ltd., China; Xiaoyu Yu, China University of Geoscience, China; and Dongkai Yang, School of Electronics and Information Engineering, Beihang University, China

**8 Step-Wise Optimal Low Power Node Deployment in LTE Heterogeneous Networks**
Ho Ting Cheng, Aaron Callard, Gamini Senarath, Hang Zhang and Peiying Zhu, Huawei Technologies Canada, Canada

**9 A Novel Adaptive Fusion Scheme For Cooperative Spectrum Sensing**
Imen Nasr and Sofiane Cherif, SUP'COM, Tunisia

*Concluding remarks (Nigel Jefferies)*

# Context-aware Proactive Systems CAPS2012

*Wednesday 5 September 2012 11:00-12:30 2104B*

### 4H: Context-aware Proactive Systems

1 **Activity recognition with implicit context classification**
Stephan Sigg, Lei Zhong, and Yusheng Ji, National Institute of Informatics (NII) Tokyo, Japan

2 **Activity recognition from Radio Frequency data: Multi-stage recognition and features**
Shuyu Shi, Stephan Sigg, Yusheng Ji National Institute of Informatics (NII) Tokyo, Japan

3 **Device Discovery in Future Service Platforms through SIP**
Yuan Chen, Suparna De, Ralf Kernchen, Klaus Moessner, University of Surrey, UK

4 **Legal assessment of context prediction techniques**
Christian Voigtmann, Klaus David, Hendrik Skistims and Alexander Roßnagel, University of Kassel, Germany

*Wednesday 5 September 2012 14:00-15:30 2104B*

### 5H: Context-aware Vehicular Applications

1 **Evaluation of a collaborative-based filter technique to proactively detect pedestrians at risk**
Christian Voigtmann, Sian Lun Lau and Klaus David, University of Kassel (ComTec), Germany

2 **A Comparison of Reactive, Grid and Hierarchical Location-based Services for VANETs**
Marwane Ayaida, Hacène Fouchal, Lissan Afilal, University of Reims, France; and Yacine Ghamri-Doudane, Université Paris-Est and ENSIIE, France

3 **VECADS: VEhicular Context-Aware Downstream Scheduling for Drive-thru Internet**
Tan Hing Hui, Wing Cheong Lau and Onching Yue, The Chinese University of Hong Kong, Hong Kong

# Tutorials

A range of tutorials will be held throughout the conference given by experts from industry and academia.

*Monday 3 September 2012, 09:00–12:30*

### T1: Mobile Radio Channel Sounding, Data Analysis, & Radio Channel Modelling

*Robert Bultitude (CRC, Canada), Sana Salous (U. Durham, UK)*

This tutorial begins with an overview by Dr. Bultitude of channel sounding basics. This will be followed by an outline of best practices for the analysis of channel sounding data and statistical channel modelling. If time permits, an introduction to more advanced work in the area of double directional channel sounding and spatial channel modelling will also be given. Professor Salous will discuss passive and active measurement techniques using both standard test equipment and custom designed radio channel sounders. The tutorial will end with the presentation of examples showing measured data, and results from the analysis thereof.

*Robert Bultitude, BSc. E. E., 1975 ( U. New Brunswick) worked on mobile systems in British Columbia, then undertook graduate studies, completing a Master's in 1979, and a Part-Time Ph.D in 1987, (both E.Eng., Carleton U.). From 1986-1999, he was Manager of Land Mobile and Indoor Radio Propagation Research at Canada's Communications Research Centre, and is now a research leader in the same division. Robert is an Adjunct Professor at Carleton University, and a Senior Member of the IEEE.*

*Sana Salous, B. E. Eng. 1978 (A.U. Beirut), Master's (Radio Coms and PhD, U. Birmingham). In 1984 she joined Yarmouk University, Jordan as assistant Professor. In 1989 after being a research fellow at Liverpool University, she joined the University of Manchester (UMIST), as a lecture, holding the positions of Senior Lecturer and Reader in 2000 and 2002. In 2003 she took up the Chair in Communications Engineering at Durham University, and is Director of the Centre for Communications Systems. Sana is a fellow of the IET and Senior Member of the IEEE.*

*Monday 3 September 2012, 13:30–17:00*

### T2: The Art of Mobile Radio Channel Modelling

*Matthias Paetzold (University of Agder, Norway)*

This tutorial provides a comprehensive overview of the modelling, analysis, and simulation of mobile radio channels. It offers a detailed understanding of fundamental issues and examines state-of-the-art techniques in mobile radio channel modelling.

Important classes of mobile fading channels will be presented, including terrestrial and satellite channels, various types of wideband channels, advanced MIMO channels, mobile-to-mobile channels, vehicle-to-vehicle channels, and channel models for cooperative communication systems. The tutorial strives for providing a fundamental understanding of many issues currently being investigated in the field.

*Matthias Paetzold, Dipl.-Ing. and Dr.-Ing., El. Eng.,1985 and 1989 (Ruhr University Bochum), received the habil. degree in Communications Engineering (Technical University of Hamburg-Hamburg) in 1998. From 1990 to 1992, he was with ANT Nachrichtentechnik GmbH, Backnang, where he was engaged in digital satellite communications. From 1992 to 2001, he was with the Department of Digital Networks at the Technical University Hamburg-Harburg. In 2001, he joined the University of Agder, Grimstad, Norway, where he is a full professor for Mobile Communications and the Head of the Mobile Communications Group. Matthias is a Senior Member of the IEEE.*

*Monday 3 September 2012, 09:00–17:00*

### T12: Mobile Radio Channel Sounding, Measured Data Analysis, and Channel Modelling

*Robert Bultitude (CRC, Canada), Sana Salous (U. Durham, UK), Matthias Paetzold (U. Agder, Norway)*

This tutorial will be presented in two half-day parts, T1 and T2, neither of which is pre-requisite for the other. For details and biographies please see the individual descriptions of T1 and T2 above.

***Monday 3 September 2012, 09:00–12:30***

## T3: Cooperative Communications

*Lajos Hanzo (U. Southampton)*

This overview introduces the principles of cooperative communication, commencing with the introduction of the basic MIMO types of

1. Beamforming;
2. Space-time coding;
3. Spatial Division Myltiplexing;
4. Spatial Division Multiple Access;

The limitations of MIMOs relying on co-located array-elements arehighlighted and it is shown, how the single-antenna-aided cooperative mobiles may circumvent these limitations by forming MIMOs having distributed elements. This concept is also referred to a Virtual Antenna Arrays (VAA). Then the corresponding amplify-forward and decode-forward protocols as well as their hybrids are studied. Channel coding has to be specifically designed for the VAAs in order to prevent avalanche-like error-propagation. Hence sophisticated three-stage-concatenated iterative channel coding schemes are proposed and it is argued that in the absence of accurate channel information at the relays the best way forward might be to use multiple-symbol differential detection. Indeed, it is rather unrealistic to expect that an altrustically relaying handset would also accurately estimate the source-relay channel for the sake of high-integrity coherent detection. EXIT-chart-aided designs are used for creating near-capacity solutions and a range of future research directions as well as open problems are stated.

*Lajos Hanzo (http://www-mobile.ecs.soton.ac.uk) FREng, FIEEE, FIET, Fellow of EURASIP, DSc received his degree in electronics in 1976 and his doctorate in 1983. In 2009 he was awarded the honorary doctorate 'Doctor Honaris Causa' by the Technical University of Budapest. During his 35-year career in telecommunications he has held various research and academic posts in Hungary, Germany and the UK. Since 1986 he has been with the School of Electronics and Computer Science, University of Southampton, UK, where he holds the chair in telecommunications. He has successfully supervised in excess of 70 PhD students, co-authored 20 John Wiley/IEEE Press books on mobile radio communications totalling in excess of 10 000 pages, published 1250+ research entries at IEEE Xplore, acted both as TPC and General Chair of IEEE conferences, presented keynote lectures and has been awarded a number of distinctions. Currently he is directing an academic research team, working on a range of research projects in the field of wireless multimedia communications sponsored by industry, the Engineering and Physical Sciences Research Council (EPSRC) UK, the European IST Programme and the Mobile Virtual Centre of Excellence (VCE), UK. He is an enthusiastic supporter of industrial and academic liaison and he offers a range of industrial courses. He is also a Governor of the IEEE VTS. Since 2008 he has been the Editor-in-Chief of the IEEE Press and since 2009 a Chaired Professor also at Tsinghua University, Beijing. For further information on research in progress and associated publications please refer to http://www-mobile.ecs.soton.ac.uk*

***Monday 3 September 2012, 13:30–17:00***

## T4: Cognitive Radio and Software Defined Radio

*Huseyin Arslan (U. South Florida)*

Today's wireless services and systems have come a long way since the rollout of the conventional voice-centric cellular systems. The demand for wireless access in voice and multi-media applications has been increasing. As a result of the convergence of computing, content, and entertainment with communication, radio equipment has become part of our daily lives. It came to a point where we cannot live without them anymore. We cannot interact, chat, find our direction, have fun or sometimes even think without them. We can leave everything behind, but, cannot go anywhere without them. The fun is actually just starting. Wait until when you see the intelligence is added to these radios. Equipped with the capability and flexibility of software defined radios and combined with the machine learning a new concept which is referred as Cognitive Radio (CR) has emerged in the wireless world. This tutorial targets to discuss the cognitive radio, software defined radio, and adaptive radio concepts from several aspects. Adaptive resource management, adaptive transmission technologies and receiver adaptations techniques for the evolution of wireless communication systems will be reviewed. The enabling techniques for these adaptations that requires sensing and measurements of some radio and interference parameters, like Doppler spread estimation, link quality estimation, signal-to-noise ratio estimation, interference temperature measurement, post-processing channel quality estimations (CRC estimation, Bit-error-rate estimation, frame erasure rate estimation) etc., will be covered.

*Huseyin Arslan has received his PhD. degree in 1998 from Southern Methodist University (SMU), Dallas, Tx. From January 1998 to August 2002, he was with the research group of Ericsson Inc., NC, USA, where he was involved with several project related to 2G and 3G wireless cellular communication systems. Since August 2002, he has been with the Electrical Engineering Dept. of University of South Florida. In addition, he has worked as part time consultant for various companies and institutions including Anritsu Company, The Scientific and Technological Research Council of Turkey- TUBITAK, Lecroy, and XG technologies.*

*Dr. Arslan's research interests are related to advanced signal processing techniques at the physical and medium access layers, with cross-layer design for networking adaptivity and Quality of Service (QoS) control. He is interested in many forms of wireless technologies including cellular radio, wireless PAN/LAN/MANs, fixed wireless access, aeronautical networks, underwater networks, in-vivo networks, and specialized wireless data networks like wireless sensors networks and wireless telemetry. The current research interests are on cognitive radio, femtocells, powerline communications, smart grid, UWB, OFDM(A) based wireless technologies with emphasis on WIMAX and IMT-Advanced, TV-White space radio, co-existence issues on heterogeneous networks with emphasis on unlicensed bands, aeronautical (High Altitude Platform) communications, and underwater acoustic communications. He has served as technical program committee chair, technical program committee member, session and*

*symposium organizer, and workshop chair in several IEEE conferences. He is a member of the editorial board for IEEE Transactions on Communications, Physical Communication Journal by Elsevier, Wireless Communication and Mobile Computing Journal by Wiley, and Journal of Electrical and Computer Engineering by Hindawi Publishing Corporation. Dr. Arslan is a senior member of IEEE.*

***Monday 3 September 2012, 09:00–12:30***

## T5: Stochastic Geometry and Random Graphs for the Modeling, Analysis, and Design of Wireless Networks

*Martin Haenggi (University of Notre Dame)*

Modern wireless systems are increasingly interference-limited. To get an analytical handle on the interference, a model is needed for the spatial distribution of the nodes.

This tutorial is about such spatial models and their use in wireless networks. It presents the techniques to average network performance over all likely network realizations, which yields general results that permit a fair comparison of different architectures and protocols. Applications include ad hoc, sensor, cellular, vehicular, and cognitive networks.

*Martin Haenggi is a Professor of Electrical Engineering and a Concurrent Professor of Applied Mathematics and Statistics at the University of Notre Dame. Over the last decade, he has conducted extensive research on the use of stochastic geometry for the analysis and design of wireless systems and published two books and over a 100 journal and conference articles on this subject. For one of the papers, he received the 2010 IEEE Communication Society Best Tutorial Paper Award.*

***Monday 3 September 2012, 13:30–17:00***

## T6: Cross-Layer Design for Spectrum- and Energy-Efficient Wireless Networks

*Guowang Miao (KTH) and Jens Zander (KTH)*

This tutorial introduces cross-layer technologies to improve both spectral and energy efficiencies from different perspectives of wireless networks. We will first discuss the basic wireless channel properties and the methodologies needed to enable high-performance wireless networks. Then we introduce state-of-art spectral and energy efficient communication technologies for both individual- and multi-user networks. To be more specific, our treatment will cover not only centralized wireless networks like cellular access networks, but also distributed ones like ad hoc and sensor networks. We will discuss in detail the relation between SE and EE in different types of wireless networks and introduce new guidelines that will significantly improve SE and EE for future network design.

*Guowang Miao received a B.S. and a M.S. degree, in 2003 and 2006, in electronic engineering from Tsinghua University, Beijing, China, and a M.S. degree and a Ph.D. degree, both in 2009, in electrical and computer engineering from Georgia Institute of Technology, Atlanta, GA, USA. He is now an assistant professor in the Department of Communications Systems, KTH - The Royal Institute of Technology, Stockholm, Sweden.*

*Jens Zander received the Ph.D Degree in Electrical Engineering from Linköping University, Sweden, 1985 respectively. He is now a professor in Radio Communications at KTH - The Royal Institute of Technology, Stockholm, Sweden. He is also a co-founder and the long-time director of Wireless@KTH, the Center for Wireless Systems at KTH. In addition, he heads the department for Communication Systems at the School of ICT at KTH. He is also the Director for Post-Graduate (Doctoral) Studies at the School of ICT.*

## Tutorial T7: Voice over LTE, by K. Daniel Wong (Daniel Wireless LLC, Palo Alto) and Vijay Varma (Applied Comm. Sciences, Red Bank, NJ) has been cancelled.

## Tutorial T8: V2V Safety Communications: An Overview and Examination of Technical Challenges, by John B. Kenney and Gaurav Bansal (Toyota InfoTechnology Center) has been cancelled.

## Tutorial T9: Economic modeling for novel spectrum management approaches: secondary markets and private commons, by Luis Guijarro (Universitat Politecnica de Valencia, Spain) has been cancelled.