The 84th *IEEE*
Vehicular Technology Conference

Final Programme

VTC2016-Fall
MONTRÉAL
A Connected World at your Fingertips

18 – 21 September 2016

Montréal, Canada

Welcome from the General Co-chairs

On behalf of the Organizing Committee, we welcome you to Canada and to IEEE VTC2016-Fall. VTC is coming back to the city of Montreal, 10 years after a very successful VTC edition in 2006. In order to make the event as enriching as possible, the organizing committee has put together a high quality program that is geared towards both academic and industry attendees.

The success of an event such as VTC depends highly on the efforts of many volunteers who have been hard at work in the last few months. Our heartfelt thanks go to all the colleagues who have contributed to these efforts. Technical Program Committee Co-chairs François Gagnon and Weihua Zhuang have coordinated the combined efforts of more than 35 Track Chairs, tens of TPC members and hundreds of reviewers to attract, review and select papers of the highest quality. The other program components have been coordinated by Tutorials Chair Pingzhi Fan, Workshops Co-chairs Claude Oestges and Olivier Renaudin, and Plenary Co-chairs Lajos Hanzo and Robert Schober. We hope you will enjoy the industry track that had been put together by our Industry Track Co-chairs Fan Bai, Christopher Cave and Zoran Zvonar. We are certain that you have seen emails coming from our Publicity Co-chairs Benoit Champagne and Chadi Assi in the weeks leading up to each of the conference deadlines. Finally, we would also like to acknowledge the important boots-on-the-ground work of our Local Arrangement Co-chairs George Kaddoum and Jean-Charles Grégoire.

The conference will take place at the Bonaventure hotel, in downtown Montreal, within walking distance from shopping, museums, and the Montreal Old Port. The latter will give you a taste or Europe in North America, and is one of the city's most famous tourist attractions. Montreal is a vibrant multicultural city, known for its hospitality, its food, its cultural scene and its numerous summer festivals. We hope you will have some time to enjoy the city and its surroundings.

We hope to see you all in Montreal, to meet old friends and make new acquaintances, network with scientists, researchers and engineers from around the world, and enrich our community's discussions.

Pierre Boucher and Fabrice Labeau
General Co-chairs, IEEE VTC2016-Fall

Welcome from the TPC Co-chairs

On behalf of the Technical Program committee, we welcome you to Montreal's fall Vehicular Technology Conference 2016. Montreal is an outstanding city to visit so make sure to try and experience fully its great dining. This year's high-level technical program was put together with invaluable assistance from 36 track co-chairs who have managed the review and selection process for close to 800 papers in conjunction with 579 TPC members who have obtained about 2200 reviews and required a minimum of three reviews per paper. The whole process was performed with professionalism, independence and devotion. The result is a strong and relevant program with an emphasis on issues which are currently followed by a wide audience. In addition to the obvious 5G mainstream trend, millimeter-wave, self-driving cars, green communication and spectrum access are issues that have growing interest.

We take this opportunity to thank all of the participating, talented authors and the passionate and hardworking people who have participated in the building of our technical program. We diligently recruited 36 track chairs who possessed both strong leadership and influence in their respective fields. They have invited a series of interesting papers, recruited TPC members, followed-up the paper submissions and review with attention. They were key in the resulting high-level program we now offer. The TPC members were assigned about 5 papers each, and they solicited a total of 2900 different individuals for reviews. We wish to acknowledge the tremendous amount of work they have all accomplished. We have followed their continuous and diligent work closely and it is quite apparent that our vehicular technology community is vibrant, hardworking and quite pleasant.

François Gagnon and Weihua Zhuang
TPC Co-chairs, IEEE VTC2016-Spring

Welcome from the VTS President

On behalf of the IEEE Vehicular Technology Society, it is with great pleasure that I welcome you to the IEEE 84th Vehicular Technology Conference in Montreal.

VTC2016-Fall will once more represent a key venue to discuss and help define the future of the mobile, wireless and vehicular industries. The conference will provide a unique opportunity for you to share your thoughts and ideas that will help shape what future 5G networks will be. This is an exciting time for our community considering the challenges cellular networks will face when applied to diverse vertical sectors.

VTC is coming back to Montreal 10 years after the successful 2006 edition. This shows how strong and vibrant the technical community is in Canada, and the strong presence of dedicated VTS volunteers who devote their time and efforts to the success of our Society. I would like to thank and recognize the remarkable work of General co-Chairs Professor Fabrice Labeau and Mr Pierre Boucher, whose leadership has been instrumental to create the conference program that you will enjoy. I would also like to express my gratitude to the Technical Program Co-chairs Professors Weihua Zhuang and François Gagnon. Their dedicated work, with the support of the Track Chairs and TPC members, has helped shape an outstanding technical program. My personal gratitude goes also to all the conference team and our VTS conference administrators for their continued support.

VTC is an excellent occasion for our members to meet with our Board of Governors, so don't hesitate to approach us if you would like to provide any feedback on the Society or to participate in its management. If you are a VTS member, join us at the VTS members' reception!

I hope that you will enjoy the conference and the city of Montreal.

Javier Gozalvez, *President*
IEEE Vehicular Technology Society

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Tianqi Yu
Xianghao Yu
Haifeng Yuan
Yazhou Yuan

Chau Yuen
Ammar Zafar
Alireza Zamani
Alberto Zanella
Shahram Zarei
Deze Zeng
Yong Zeng
Hans-Jürgen
 Zepernick
Chao Zhai
Jianyang Zhai
Aiqing Zhang
Andrew Zhang
Chao Zhang
Chiya Zhang
Haijun Zhang
Haijun Zhang
Hao Zhang
Haotian Zhang
Heli Zhang
Jun Zhang
Kecheng Zhang
Lan Zhang
Lei Zhang
Lei Zhang
Li Zhang
Liang Zhang
Lu Zhang
Ning Zhang
Ran Zhang
Ruonan Zhang
Shan Zhang
Shigeng Zhang
Wei Zhang
Wuxiong Zhang
Xiaoxu Zhang
Xing Zhang
Yang Zhang

Yi Zhang
Yongmin Zhang
Zhikun Zhang
Zhiyu Zhang
Dongmei Zhao
Guodong Zhao
Kanglian Zhao
Nan Zhao
Qun Zhao
Tianyu Zhao
Wanlong Zhao
Yuxin Zhao
Haifeng Zheng
Chengwei Zhou
Fuhui Zhou
Haibo Zhou
Mu Zhou
Xiong Zhou
Xun Zhou
Yong Zhou
Yuan Zhou
Yuchen Zhou
Zhenyu Zhou
Dalin Zhu
Hongzi Zhu
Li Zhu
Liang Zhu
Lina Zhu
Wei-Ping Zhu
Yanmin Zhu
Jie Zhuang
Weihua Zhuang
Dimitrios Zorbas
Marwen Zorgui
Deyue Zou
Jun Zuo

Registration

Registration will take place in Inscription, beside the escalators. Opening times are:
- Sunday 18 September 2016 07:30 - 17:30*
- Monday 19 September 2016 07:30 - 17:30
- Tuesday 20 September 2016   07:30 – 17:30
- Wednesday 21 September 2016   08:00 – 16:00

* After 18:00 on Sunday, you may pick up your badge and tickets at the reception – bags can be picked up on Monday.
(**Your registration receipt is required to pick up your registration at the reception.**)

Social Events

Coffee breaks will take place in Fontaine B. Lunches are included as part of the full registration and will be served in Ballroom: Outremont-Westmount-Mount Royal-Hampstead-Cote St-Luc. The welcome reception will be conducted on Sunday evening, in Salon Bonaventure. The banquet on the evening of Monday 19 September 2016 will begin at 18:00 in the Windsor Hotel.

Lunches, the reception and banquet require admission tickets to gain entry and these are included in your registration packet. Be sure to present the correct day's lunch ticket or you will not be served. You also may purchase tickets for these events at the registration desk.

VTS members are invited to a VTS member reception 18:00 to 20:00 on Tuesday 20 September 2016.

The IEEE Montreal Young Professionals Affinity Group and the IEEE Vehicular Technology Society will be hosting a special session on Publishing within IEEE Journals and Conferences on Tuesday evening. Admission is free for IEEE Young Professionals, but space is limited. Pre-registration is necessary through https://meetings.vtools.ieee.org/m/41031.

Patrons and Exhibitors

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Plenaries

Monday 19 September 2016, 9:00–10:00 (Ballroom: Outremont-Westmount)
5G Physical Layer: Technology Opportunities and Challenges
Reinaldo. A. Valenzuela, *Director, Communications Theory Research Dept., Bell Labs, Alcatel-Lucent*

The insatiable demand for media rich content and the increasing availability of advanced devices such as smart phones, tablets, etc., has forced the mobile communications eco system to start in earnest to consider the next generation solutions to address these needs. Some of the options being mentioned as ingredients for such 5th Generation mobile radio systems include Small Cells, HetNets, Carrier Aggregation, Machine-to-Machine, Internet-of-Things, Relays, Device-to-Device and operation in the millimeter wave spectrum range, among others. In this talk, I will review some of the background trends driving the evolution of broadband wireless access that will impact the technology choices beyond 2020. Then, I will consider in some detail some of the most intriguing options service providers may consider.

Reinaldo A. Valenzuela: Fellow IEEE. IEEE Eric E. Sumner Award. Bell Labs Fellow. WWRF Fellow, 2014 IEEE CTTC Technical Achievement Award, 2015 IEEE VTS Avant Garde Award. B.Sc. U. of Chile, Ph.D. Imperial College. Director, Communication Theory Department, Distinguished Member of Technical Staff, Bell Laboratories.

Engaged in propagation measurements and models, MIMO/space time systems achieving high capacities using transmit and receive antenna arrays, HetNets, small cells and next generation air interface techniques and architectures.

He has published 190 papers and 44 patents. He has over 24,000 Google Scholar citations and is a Highly Cited Author In Thomson ISI and a Fulbright Senior Specialist.

Tuesday 20 September 2016, 9:00–9:45 (Ballroom: Outremont-Westmount)
Channels and systems for wireless communications in high-mobility environments
Andy Molisch, *Professor of Electrical Engineering, University of Southern California*

As 5th generation wireless systems are emerging, it becomes clear that one of the main applications will be communication in high-mobility environments. Two scenarios draw particular attention: high-speed trains (HST) and V2X (vehicle-to-vehicle as well as vehicle-to-infrastructure) communications. V2X communications serve to increase safety and improve efficiency of vehicular traffic, e.g., warning of emergency stopping maneuvers, traffic jams, and road hazards. Furthermore, they will serve as a critical component of autonomous vehicles. HSTs are a major mode of long-distance passenger transportation in many areas of the world, and enabling passengers to access high-speed wireless links will increase their appeal to users. Furthermore, also HSTs can use wireless connections for improved safety and reliability.

This talk will start out with a review of these applications and the resulting requirements for 5G systems for V2X and HST. We will then discuss the particular properties of propagation channels in these environments, which are significantly different from many other cellular channels. We then discuss various approaches to dealing with the main channel effects such as high Doppler spreads, channel nonstationarities, and shadowing, and discuss transmission strategies that are well suited for these environments. We finally outline established (IEEE 802.11p) as well as emerging 5G (3GPP) system designs for these environments.

Andreas F. Molisch received his PhD and habilitation from TU Vienna in 1994 and 1999, respectively. He subsequently was at TU Vienna, FTW, AT&T (Bell) Labs, Lund University, and Mitsubishi Electric Research Labs. Since 2009 he has been Professor of Electrical Engineering at the University of Southern California, where he is also currently Director of the Communication Sciences Institute. His research interest is wireless communications, with emphasis on wireless propagation channels, multi-antenna systems, ultrawideband signaling and localization, novel cellular architectures, and cooperative communications. He is the author of four books, 18 book chapters, more than 450 journal and conference papers, as well as 80 patents. He is a Fellow of the National Academy of Inventors, Fellow of IEEE, AAAS, and IET, as well as Member of the Austrian Academy of Sciences and recipient of numerous awards.

Tuesday 20 September 2016, 9:45–10:30 (Ballroom: Outremont-Westmount)
Networked Society and 5G
Jaco du Plooy, *Head of Technology, Ericsson, Customer Unit Canada*

5G is the next step in the evolution of mobile communications and will be a key component of the networked society. In particular, 5G will accelerate the development of critical machine type communications (MTC) with

capabilities including very high achievable data rates, very low latency and ultra-high reliability – all of which are of critical importance as vehicular technology evolves on the road to 5G.

Jaco du Plooy is Head of Technology for Ericsson in Customer Unit Canada. He is responsible for the complete Ericsson portfolio including Network, IT, Cloud and Media products and services towards Ericsson customers in Canada and has 17 years of experience in the telecommunications industry.

du Plooy joined Ericsson US in 2004 and has spent over 12 years working with a large tier 1 operator in the US launching innovative services in wireless access (2G, 3G, 4G) and was also responsible for Network Function Virtualization, Software Defined Networking, IPTV, Voice/Packet core and IMS. In addition to these responsibilities, he provided technology leadership in Internet of Things and 5G before moving to Canada in June 2016.

Prior to joining Ericsson, he held various Network Planning, Engineering and consulting positions with mobile operators and consulting firms based in the UK and South Africa.

du Plooy holds a Bachelor degree in Electronic Engineering from Rand Afrikaans University, Johannesburg, South Africa.

Wednesday 21 September 2016, 9:00–9:45 (Ballroom: Outremont-Westmount)
Sustainable Spectrum Management for Vehicular Technology
Jean Luc Bérubé, *President, Communications Research Centre*

With the increasingly wireless connected society, spectrum regulators worldwide are facing relentless demand for more access to spectrum, be it from the latest applications, services or emerging technology like self-driving cars. While the current paradigm of assigning fixed frequencies for a given service is still relied upon, the prevailing view of the Canadian spectrum regulator is that this paradigm is not sustainable in the long run, both from the pace of spectrum release required to sustain innovation as well as which spectrum to release. This talk will present some of the issues faced by the Canadian spectrum regulator and the steps taken towards a sustainable spectrum management regime in Canada to support innovation.

Dr. Jean Luc Bérubé became President of the Communications Research Centre in 2011, after serving 17 months as a research vice-president. When he joined CRC in 2009, he brought a proven track record in managing the human and technological issues inherent in complex telecommunications R&D projects.

Dr. Bérubé is overseeing three research priorities including a foresight function for Innovation, Science and Economic Development Canada (ISED), and direct client support R&D. Chief among CRC's clients is ISED's Spectrum, Information Technologies and Telecommunications sector, followed by other government organizations, industry and academia. Rounding out CRC's research priorities is Grand Challenge R&D, tackling challenges of spectrum awareness, spectrum use and spectrum supply, all of which are central to meeting wireless demand for a modern digital economy.

Dr. Bérubé began his career in 1984 as a design engineer with Canadian Marconi Company. In 1993 he joined Nortel, leading teams designing advanced telecommunications equipment. He moved to Motorola in 1997, working to ensure that product planning and customer needs were tightly aligned. In 2000 Dr. Bérubé joined Altera Corporation, where he oversaw both applications and market development for the Canadian wireless and broadband network communications sectors.

Dr. Bérubé holds a Bachelor of Science degree from the University of New Brunswick (UNB), a Master of Applied Science degree from Montréal's École Polytechnique, and a Doctorate from UNB, all in electrical engineering.

Wednesday 21 September 2016, 9:45–10:30 (Ballroom: Outremont-Westmount)
Where is 5G leading us?

Moderator:	**Charles Despins**	*Ecole de Technologie Superieure*
Panelists:	**Peiying Zhu**	*Huawei Fellow, Wireless Technology Lab, Huawei*
	Håkan Andersson	*5G Strategy Responsible, Ericsson*

This panel will consider the future direction of 5G communications.

Charles Despins' career has spanned more than 30 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 Tele-communications (Canadian cellular operator) and later at Bell Nordiq Group as vice-president and chief technology officer. He has also worked as a consultant for wireless network deployments in India and China. From 2003 to 2016, he was also and CEO of Prompt inc., an ICT university-industry research and development consortium. He is now 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 a former recipient of the "Best Paper of the Year" award in IEEE Transactions on Vehicular Technology. He is currently a frequent advocate on issues regarding the opportunities ICT offer to achieve sustainability in the 21st century.

Peiying Zhu is a Huawei Fellow. She is currently leading 5G wireless system research in Huawei. The focus of her research is advanced wireless access technologies with more than 150 granted patents. She has been regularly giving talks and panel discussions on 5G vision and enabling technologies. She served as the guest editor for IEEE Signal processing magazine special issue on the 5G revolution and co-chaired for various 5G workshops. She is actively involved in IEEE 802 and 3GPP standards development. She is currently a WiFi Alliance Board member.

Prior to joining Huawei in 2009, Peiying was a Nortel Fellow and Director of Advanced Wireless Access Technology in the Nortel Wireless Technology Lab. She led the team and pioneered research and prototyping on MIMO-OFDM and Multi-hop relay. Many of these technologies developed by the team have been adopted into LTE standards and 4G products.

Peiying Zhu received the Master of Science degree and Doctor Degree from Southeast University and Concordia University in 1985 and 1993 respectively.

Håkan Andersson is "5G Strategy Responsible" and has been driving Ericsson's 5G Strategy at the company's Business Network Products since May 2014. Before the current position, he spent 5 year at the Ericsson Group Function for Technology, where he was responsible for driving the Ericsson Technology Strategies.

From 2003 and in the work leading up to the development and launch of 4G/LTE, Andersson had a similar role for LTE and was responsible for the development of the strategies and investment plans leading up to the establishment of a dedicated product line for LTE in 2007.

Dr. Andersson started in Ericsson Radio Research in 1990, and has since then held various positions both in Research and Technology, as well as Product Management, in different parts of the world. His career includes positions as head of Technology for Ericsson Philippines, Head of Industry Relations in Singapore, Director at Group Function Portfolio Management and CTO of the AT&T account in the US.

Andersson holds a Master´s degree in Electrical Engineering and a Doctors degree in Physics, both from the Royal Institute of Technology in Stockholm, Sweden.

Industry Track

Monday 19 September 2016, 11:00–12:30 (Salon Bonaventure et Terrace)
Customer, Service and Network Design in 5G: Operational and Management Challenges

Moderator:	**Haris Gacanin**	*Customer Experience Management, Applications and Analytics, Nokia*
Panelists:	**Benoit Pelletier**	*Member of Technical Staff, InterDigital*
	Said Zaghloul	*Director of Product Strategy, Sandvine*

The customer experience is raising up as the major design and deployment driver in 5G. Telecom operator's major revenues are strongly related to customer experience management which in 5G will be more than ever dependent on different technologies such as radio, networking, cloud, analytics, etc. The aim of this session is to bring different dimensions to the traditional thinking of the design and operational aspects, and focus to outline the associated research challenges related to service- and customer-centric designs in 5G. This session gives an overview of potential research directions related to aforementioned 5G service and network operational aspects and their implications to customer experience. We aim to outline different dimensions in comparison with the traditional network (technology)-centric thinking and focus on the associated research challenges.

Haris Gačanin received his Dipl.-Ing. degree in Electrical engineering from the Faculty of Electrical Engineering, University of Sarajevo in 2000. In 2005 and 2008, he received M.E.E. and Ph.D.E.E. from Tohoku University, Japan. He was with Tohoku University from April 2008 until May 2010 first as Japan Society for Promotion of Science postdoctoral fellow and then, as Assistant Professor. He is currently Research Director of Nokia's Wireless Analytics Research Lab in Belgium. His professional interests research management with strong emphasis on product/solution development through applied research projects: advanced signal processing and algorithms with focus on mobile/wireless and wireline physical (L1) and media access (L2) layer technologies and network architectures. He has more than 120 scientific publications (journals, conferences and patent applications) and invited/tutorial talks. He is senior member of IEEE and IEICE. He is an Associate Editor of IET Communications and IEICE Transactions on Communications. He acted as a chair, review and technical program committee member of various technical journals and conferences. He is a recipient of IEICE Communication System Study Group (2015) Award, the 2013 Alcatel-Lucent Award of Excellence, the 2012 KDDI Foundation Research Award, the 2009 KDDI Foundation Research Grant Award, the 2008 Japan Society for Promotion of Science (JSPS) Postdoctoral Fellowships for Foreign Researchers, the 2005 Active Research Award in Radio Communications, 2005 Vehicular Technology Conference (VTC2005-Fall) Student Paper Award from IEEE VTS Japan Chapter and the 2004 Institute of IEICE Society Young Researcher Award.

Dr. Benoît Pelletier received his Ph.D. degree in Telecommunications and Signal Processing in 2007 from McGill University, Montréal, Canada. As system design engineer for InterDigital Canada Ltée., he has contributed from 2007 to 2011 to the evolution of HSPA/HSPA+ systems, specializing in L1/L2 protocol design aspects. Now Member of Technical Staff, his current work focuses on the evolution of LTE and on the design of 5G wireless systems. In addition to being an author on numerous peer-reviewed journal and conference publications, he also holds over 40 granted patents and 100 patent applications. He co-organized the Device-to-Device Wireless Communications

for Mobile Cellular Network workshop at ICC 2015, acted as TPC for the Globecom Workshop on Device-to-Device (D2D) Communication With and Without Infrastructure and as a reviewer for IEEE conferences and journals. His current research interests include 5G system design, device-to-device communications, vehicular communications, Hybrid-ARQ and statistical signal processing.

Said Zaghloul is Director of Product Strategy at Sandvine. In his role, Said focuses on Sandvine's usage management and big data integration products and solutions. Said is also responsible for key OEM activities and works with other product managers to ensure roadmap alignment and implementation of product management best practices. Said has over 15 years of telecommunications industry and research experience. Prior to Sandvine, he served as product manager, systems architect, member of research staff, and design engineer for various institutions, including Flextronics, Redknee, Sprint, Siemens, and the Institute of Computer and Network Engineering at the Technical University of Braunschweig. Said received his PhD and MSc degrees from the Technical-University of Braunschweig, Germany and the University of Kansas, USA in 2010 and 2005 respectively. Said is a Fulbright Alumnus and author of over 20 refereed IEEE and ACM journal and conference articles, and industry patents.

Monday 19 September 2016, 14:00–15:30 (Salon Bonaventure et Terrace)
5G Architecture: From Research and Standardization to Implementation

Moderator:	**Simone Redana**	*Manager, Radio Research Nokia*
Panelists:	**Naseem Khan**	*Distinguished Member of Technical Staff, Verizon*
	Vincent D. Park	*Senior Director of Engineering, Qualcomm*

Mobile networks have become the main communication vehicle for the upcoming connected society. In addition to humans, billions of machines will be connected to the network in the future, leading to a massive traffic increase beyond 2020. However, such traffic increase does not necessarily lead to a similar increase in the revenue of mobile network operators, which need to make very high investments to manage this traffic. The challenge is thus to deploy a mobile network that can satisfy the requirements of the society and at the same time be sustainable for network operators.

A fundamental piece to address this challenge is the design of a novel mobile network architecture that provides the necessary flexibility to offer new services in an efficient way. This notably requires the sharing or distribution of infrastructure resources dynamically, such that operators can increase revenue through new services, while leveraging the efficiency of the architecture to do so in a cost-effective way.

Current mobile networks are not well suited to address the above challenge. While current architectures have been very successful in the last few years, they do not provide the required flexibility to cope with the service and traffic diversity targeted by 5G mobile networks nor do they address the current trends in terms of topologies.

Such trends (in terms of traffic and topologies) make networks increasingly heterogeneous and require tailored solutions to adapt to each specific scenario and service in an efficient way. The central goal of this panel is to discuss about future mobile network architectures that can flexibly adapt its operation to the specific characteristics and requirements of a given service and scenario. This panel explores, among others, the following novel concepts in the context of novel mobile network architecture for the 5G era:

- Flexible RAN architectures and C-RAN
- Functional split and function placement
- Multi-service architectures
- 5G wireless technologies
- Cloud-based 5G mobile architectures
- Network Function Virtualization NFV
- Multi-tenancy architectures
- Convergence of RAN and Core

Dr. Simone Redana received the MSc and Ph.D. degrees from the Politecnico di Milano, Milan, Italy, in 2002 and 2005 respectively. In 2006, he joined Siemens Communication in Milan. Since 2008, he has been with Nokia Networks in Germany, where he currently leads the Radio Research Group in Munich. He contributed to the relay concept design in the EU project WINNER II and the Eureka Celtic project WINNER+ as well as he led the work package on advanced relay concept design in the EU project ARTIST4G. He contributed to the business case analysis of relay deployments and to the standardization of Relays for Long Term Evolution (LTE) Release 10. He led research and standardization projects on Self-Organizing Network (SON) for LTE Release 11. His current research interests are on novel architecture solutions for 5G era;

Simone is coordinating the 5G NORMA (Novel Architecture for 5G era) project and chairing the 5G Architecture WG within the 5GPPP Initiative. He has been organizing the 5G Architecture workshop @ VTC Spring 2015 in Glasgow, and he has moderated the 5G Architecture panel @ ICC 2015 in London and @ GC 2015.

Naseem Khan is currently involved with wireless network strategy, architecture, planning, and standardization at Verizon focusing on 5G, SDN, NFV, IoT, mobile core, CPE, and spectrum sharing. His current responsibilities include defining 5G architecture and conducting 5G pre-commercial field trials. His previous work experience includes: wireless networks, network convergence, policy control/QoS, 3GPP IMS/VoLTE, IPTV, FTTP, and network performance, reliability, and management.

He has led technology planning, evaluation, and implementation, industry partnerships and RFP initiatives. He has served on a number of standards committees and boards in leadership roles. Previously, he held management and senior technical positions at companies including AT&T/Lucent Bell Labs and Motorola. He holds a Ph.D. in Computer Science, and MS and BS in Electrical Engineering, and has received numerous awards including Verizons Telecom Leaders Circle and Multiservice Forum Senior Fellow.

Vincent D. Park is a Senior Director of Engineering at Qualcomm Technologies Inc., where he conducts research on mobile network architectures and protocols. His present research efforts are focused on 5G mobile networks and include work in the areas of mobility management, mobile edge computing, information-centric networking, and vehicular networking. He was an early innovator in the area of proximity-aware internetworking and led the networking design of the FlashLinQ system that preceded the standardization of 3GPP Proximity Services for LTE as well as the specification of Wi-Fi Alliance Neighbor Awareness Networking. Prior to joining Qualcomm, he was a technical lead at Flarion Technologies Inc., where he was a key designer of the Flash-OFDM system, a truly all-IP cellular network. Prior to this, he was part of the Networks and Communications Systems Branch at the U.S. Naval Research Laboratory, where his research was primarily in the area of mobile ad hoc networking. He is an inventor of over 80 granted U.S. patents and has been a participant and contributor to various standards organizations, including both IETF and IEEE-SA. He received both his Bachelor's and Master's degrees in Electrical Engineering from the University of Maryland.

Monday 19 September 2016, 16:00–17:30 (Salon Bonaventure et Terrace)
LTE Advanced Pro

Moderator:	**Anthony Soong**	*Chief Scientist at Huawei Technologies*
Panelists:	**Robert W. Heath Jr.**	*UT Austin*
	Stefan Parkvall	*Principal Researcher, Ericsson*
	Eric Hardouin	*Director of Ambient Connectivity, Orange Labs*
	Chih-Lin I	*Chief Scientist of wireless technologies, China Mobile*

There is no dispute that the wide spread acceptance of smart phone has transformed our society. A critical enabler of this smart phone revolution is the wide spread deployment of 4G LTE systems. Currently there are 407 global LTE commercial networks in 142 countries serving half a billion subscribers. The LTE industry is growing rapidly and, in 2014, it grew at a rate of 142%. Given the enormous investments worldwide in LTE, there is a strong desideratum within the carrier community to continue to evolve their investments in order to meet the end-user experience expected in the foreseeable future and develop the LTE-Advanced Pro system. The panel of academic and industrial experts from both the vendor and carrier community will discuss the specific drivers and market needs, the technologies and capabilities, research directions as well as deployment strategies associated with LTE-Advanced Pro.

Anthony C. K. Soong received the B.Sc. degree in animal physiology and physics from the University of Calgary, and the B.Sc. degree in electrical engineering, the M.Sc. degree in biomedical physics and the Ph.D. degree in electrical and computer engineering from the University of Alberta. He is currently the Chief Scientist for Wireless Research and Standards at Huawei Technologies Co. Ltd, in the US. His research group is actively engaged in the research, development and standardization of the next generation cellular system. He is on the board of OPNFV and served as the chair for 3GPP2 TSG-C NTAH (the next generation radio access network technology development group) from 2007-2009 and vice chair for 3GPP2 TSG-C WG3 (the physical layer development group for CDMA 2000) from 2006-2011. Prior to joining Huawei, he was with the systems group for Ericsson Inc and Qualcomm Inc. His research interests are in statistical signal processing, robust statistics, wireless communications, spread spectrum techniques, multicarrier signaling, multiple antenna techniques, network virtualization, SDN and physiological signal processing.

Dr. Soong is a Fellow of the IEEE. He has published numerous scientific papers and has more than 80 patents granted or pending. He was the co-recipient, with his co-authors, of the 2013 IEEE Signal Processing Society Best Paper Award. He received the 2005 award of merit for his contribution to 3GPP2 and cdma2000 development. He is on the advisory broad of 2014 IEEE Communication Theory Workshop and has served on the technical program committee, as well as, chaired at numerous major conferences in the area of communications engineering. He has acted as guest editor for the IEEE Communications Magazine and IEEE Journal on Selected Areas in Communications.

Robert W. Heath Jr. received the Ph.D. in EE from Stanford University. He is a Cullen Trust for Higher Education Endowed Professor in the Department of Electrical and Computer Engineering at The University of Texas at Austin and Director of the Wireless Networking and Communications Group. He is also the President and CEO of MIMO Wireless Inc and Chief Innovation Officer at Kuma Signals LLC. He has been an associate editor for the IEEE Transactions on Vehicular Technology, an editor for the IEEE Transactions on Communications, and lead guest editor for special issues on limited feedback (JSAC), heterogeneous networks (JSTSP), and most recently millimeter wave signal processing (JSTSP).s Prof. Heath is a recipient of the 2012 Signal Processing Magazine Best Paper award, a 2013 Signal Processing Society best paper award, the 2014 EURASIP Journal on Advances in Signal Processing best paper award, and the 2014 Journal of Communications and Networks best paper award. He is a licensed Amateur Radio Operator, a registered Professional Engineer in Texas, and is a Fellow of the IEEE.

Stefan Parkvall (S'92-M'96-SM'05) is currently a principal researcher at Ericsson Research working with research on 5G and future radio access. He is one of the key persons in the development of HSPA, LTE and LTE-Advanced radio access and has been deeply involved in 3GPP standardization for many years. Dr Parkvall served as an IEEE Distinguished Lecturer 2011-2012, and is co-author of the popular books "3G Evolution

– HSPA and LTE for Mobile Broadband", "HSPA evolution – the Fundamentals for Mobile Broadband", and "4G – LTE/LTE-Advanced for Mobile Broadband". He has numerous patents in the area of mobile communication. In 2005, he received the Ericsson "Inventor of the Year" award, in 2009 the Swedish government's Major Technical Award for his contributions to the success of HSPA, and in 2014 he and colleagues at Ericsson was nominated for the European Inventor Award, the most prestigious inventor award in Europe, for their contributions to LTE. Dr Parkvall received the Ph.D. degree in electrical engineering from the Royal Institute of Technology in 1996. His previous positions include assistant professor in communication theory at the Royal Institute of Technology, Stockholm, Sweden, and a visiting researcher at University of California, San Diego, USA.

Dr. Eric Hardouin is the director of the "Ambient Connectivity" research domain of Orange Labs, which investigates future access and transport networks and technologies, as well as related business models. Eric received his Ph.D. degree in signal processing and telecommunications from Telecom Bretagne, France, in 2004. Since 2004, he has been with Orange Labs, where he has conducted or supervised research on interference mitigation for mobile networks. Between April 2008 and March 2009, Eric led the Innovations work package of the Celtic project WINNER+, whose goal was to propose innovative radio techniques for IMT-Advanced systems. Between 2008 and 2013 he represented Orange in the physical layer standardization group of 3GPP (RAN WG1) for HSPA, LTE and LTE-Advanced. From 2012 to 2015, Eric coordinated the research on wireless networks in Orange Labs. Eric had a leading role in the NGMN 5G White Paper, as co-lead of the work on 5G requirements. Eric is the author of the book "LTE et les réseaux 4G" (in French).

Chih-Lin I received her Ph.D. degree in electrical engineering from Stanford University. She has been working at multiple world-class companies and research institutes leading the R&D, including AT&T Bell Labs; Director of AT&T HQ, Director of ITRI Taiwan, and VPGD of ASTRI Hong Kong. She received the IEEE Trans. COM Stephen Rice Best Paper Award, is a winner of the CCCP National 1000 Talent Program, and has won the 2015 Industrial Innovation Award of IEEE Communication Society for Leadership and Innovation in Next-Generation Cellular Wireless Networks.

In 2011, she joined China Mobile as its Chief Scientist of wireless technologies, established the Green Communications Research Center, and launched the 5G Key Technologies R&D. She is spearheading major initiatives including 5G, C-RAN, high energy efficiency system architectures, technologies and devices; and green energy. She was an Area Editor of IEEE/ACM Trans. NET, an elected Board Member of IEEE ComSoc, Chair of the ComSoc Meetings and Conferences Board, and Founding Chair of the IEEE WCNC Steering Committee.

She was a Professor at NCTU, an Adjunct Professor at NTU, and currently an Adjunct Professor at BUPT. She is the Chair of FuTURE 5G SIG, an Executive Board Member of GreenTouch, a Network Operator Council Founding Member of ETSI NFV, a Steering Board Member of WWRF, a member of IEEE ComSoc SDB, SPC, and CSCN-SC, and a Scientific Advisory Board Member of Singapore NRF. Her current research interests center around "Green, Soft, and Open".

Tuesday 20 September 2016, 11:00–12:30 (Salon Bonaventure et Terrace)
LTE vs DSRC for Connected Vehicle: Competing or complementing?

Moderator:	**Sue Bai**	*Principal Engineer at Honda R&D*
Panelists:	**John Kenney**	*Director and Principal Researcher at Toyota InfoTechnology Center*
	Radovan Miucic	*Senior Intelligent Vehicle Engineer, Changan US R&D Center, Inc.*
	George Tsirtsis	*Sr Director of Engineering, Qualcomm*
	Anthony Soong	*Chief Scientist, Huawei Technologies*

This session will have industry experts from both DSRC and LTE side present the connected vehicle application needs, compare and contrast DSRC and LTE technology, and discuss the opportunity to co-exist and complement each other, vs one-or-the-other future direction.

Sue Bai is a principal engineer in the Automobile Technology Research department at Honda R&D Americas, Inc. Her area of research spans from in-vehicle navigation system with wireless communication, Telematics system design and development, to cooperative safety system research. Her current responsibilities are research on V2X communication systems for safety, mobility and automated vehicle systems. She has been the chair/vice chair woman of the SAE DSRC Vehicle Safety Technical Committee since for several years to develop the V2X over-the-air message standards including V2V, V2Infrastructure and V2Other road users such as pedestrian, cyclist and road workers.

Dr. John Kenney is Director of networking research and a Principal Researcher at the Toyota InfoTechnology Center in Mountain View, California. He represents Toyota in international standards organizations and industry research consortia. He also represents Toyota in DSRC Spectrum Sharing discussions with the US Government and the Wi-Fi industry. He served as General Co-Chair of the IEEE SmartVehicles workshops 2014-16, and of the ACM VANET workshops 2011-12. Prior to his work with Toyota, John was a member of the Tellabs Research Center and an Adjunct Professor at the University of Notre Dame. He has graduate degrees from Stanford and Notre Dame.

Dr. Radovan Miucic is a Senior Intelligent Vehicle Engineer at Changan US R&D Center, Inc.

Radovan Miucic received the B.S., M.S. and Ph.D. degrees in computer engineering from Wayne State University, Detroit MI, in 2001, 2002 and 2009, respectively. He worked as research engineer for Honda R&D Americas, Inc. (2007-2015) and as an embedded software engineer (2001-2007), working for Visteon, Delphi and Siemens. He joined Changan US R&D Center, Inc. in 2015, as a Senior Intelligent Vehicle Engineer in Connected and Autonomous Group. He is also Adjunct Professor of Electrical Engineering at Wayne State University from 2012. In his previous role he represented Honda in various U.S. Department of Transportation sponsored projects: Vehicle Infrastructure Integration (2007-2008), within Vehicle Safety Communication (VSC) consortium: VSC-Applications (2008-2009), VSC-

Interoperability (2010–2014), and VSC- Security (2013-2014). His previous research interest was in optimization of in-vehicle networks and embedded software architecture. His current research is in wireless communication, sensors for autonomous driving, and development of cooperative safety applications.

George Tsirtsis is a Senior Director of Technology at Qualcomm Inc with over 20 years of experience in the Internet and Cellular industries. Mr Tsirtsis studied Electronics in TEI Piraeus in Greece in 1994, and then received an MSc in Telecommunication and Information Systems from University of Essex in the UK. From 1996 to 2000, he was in BT Labs in the UK working on networking research, IPv4/v6 protocol and mobility design, at which time he participated in the Internet Engineering Task Force (IETF) authoring many RFCs. In 2000 he joint Flarion

Technology and became responsible for the mobility management system design of the Flash-OFDM solution (a pre-LTE 4G system). In 2006 Flarion Technologies was acquired by Qualcomm Inc where George started by transferring his expertise into the 4G/LTE design and specification in 3GPP Release 8 and 9. In 2007 he started working on Device to Device (D2D) discovery and communication research project, and in 2011 he took over the project to standardize the technology (3GPP Release 12/13) and to then productize it. Since 2015 George and his research team have been working on extensions to D2D for vehicular communications resulting into the Cellular V2X (C-V2X) standards evolving today in 3GPP R14 and beyond.

Anthony C. K. Soong's bio appears on page 16.

Tuesday 20 September 2016, 14:00–14:30 (Salon Bonaventure et Terrace)
Convergence of Broadcasting and Broadband Wireless System in 5G Environment
Yiyan Wu, *Principal Research Scientist, Communications Research Centre Canada*

Broadcasting, as an one-to-many communication system, has not been fully exploited in the current broadband wireless system. As the ever-increasing demands for high volumes of video over broadband services continue, there will be over-loading pressure on the core network of broadband wireless system. Broadcasting/multicasting is an efficient way to distribute the most watched video and multimedia services to a large number of audiences, which can reduce the pressure on network and preserve valuable spectrum resources. This presentation gives a brief introduction on the next generation digital TV system, a.k.a. ATSC 3.0, physical layer technologies, and the related R&D works conducted at CRC Canada. These technologies could greatly improve the LTE-Broadcast (eMBMS) and Point-to-Multipoint communication system in 5G ecosystem. In this presentation, the possible improvements of the eMBMS system are discussed. The future technology trends and possible road map toward the convergence of broadcasting system into a unified broadband wireless system are presented.

Dr. Yiyan Wu received PH. D. degree in Electrical Engineering from Carleton University, Ottawa, Canada in 1990. Currently, he is a principal research scientist with the Communications Research Centre Canada (CRC). His research interests include broadband multimedia communications, signal processing, and communication systems engineering. He is a Fellow of the IEEE, a Fellow of the Canadian Academy of Engineering, an adjunct professor of Carleton University, Ottawa, Canada, and Western University, London, Ontario, Canada. Dr. Wu is a member of the Advanced Television Systems Committee (ATSC) Board of Directors representing IEEE, and the Editor-in-chief of the IEEE Transactions on Broadcasting.

Tuesday 20 September 2016, 14:30–17:30 (Salon Bonaventure et Terrace)
Mission-Critical 5G for Vehicle IoT
Moderators: **Naseem Khan,** *Distinguished Member of Technical Staff, Verizon*
  Yin Liu, *Ericsson*
Panelists: **Chih-Lin I,** *Chief Scientist of wireless technologies, China Mobile*
  Stefan Parkvall, *Principal Researcher, Ericsson*
  Amitabha Ghosh, *Nokia Fellow and Head of Small Cell Research, Nokia Bell Labs*
  Vincent D. Park, *Senior Director of Engineering, Qualcomm*
  Shaun Kirby, *Chief Technologist for Rapid Prototyping, Cisco*
  Muthaiah Venkatachalam, *Director of System Architecture, Intel Corporation*

As the next gen cellular technology, 5G is expected to play an important role in meeting mission critical communication needs of Vehicle IoT, which includes extremely low latency and highly reliable communication (both V2V and V2X) with the objective of improving safety of drivers, passengers, and other near-by road participants as well as controlling congestion. This session will provide perspectives on the status of the related activities in the industry. It will focus on mission critical vehicular 5G requirements, findings from research and standards, possible architectures and deployment models, co-existence with other types of communication networks, business models, promises and challenges.

Naseem Khan's bio appears on Page 15.

Yin Liu works with Ericsson, and currently she is a Technical Subject Matter Expert on 5G aspects in Ericsson China. She is now the driver of 5G Technology activities in Ericsson China, including the 5G standardization, technology trials, 5G use case studies and customer engagement etc. Her focused areas include

5G RAN & Network architecture, V2X/ ITS, massive & mission-critical MTC etc. Dr. Liu joined Ericsson in 2005 and worked as Senior Researcher in Ericsson Research, Senior LTE Portfolio Manager in Region North East Asia. Her previous experiences include LTE standardization support, Regional LTE product planning and management, Network performance management. In addition, she has participated and driven technical sales support activities on LTE RAN for regional markets. She received the Ph.D degree from Dept. of Electrical Engineering of Technical University of Kaiserslautern, Germany, & the bachelor degree of Dept. of Automation, Tsinghua University, China.

Chih-Lin I's bio appear on Page 17.

Stefan Parkvall's bio appears on Page 16.

Amitabha (Amitava) Ghosh is Nokia Fellow and Head, Small Cell Research at Nokia Bell Labs. He joined Motorola in 1990 after receiving his Ph.D in Electrical Engineering from Southern Methodist University, Dallas. Since joining Motorola he worked on multiple wireless technologies starting from IS-95, cdma-2000, 1xEV-DV/1XTREME, 1xEV-DO, UMTS, HSPA, 802.16e/WiMAX and 3GPP LTE. Dr. Ghosh has 60 issued patents, has written multiple book chapters and has authored numerous external and internal technical papers. He is currently working on 3GPP LTE-Advanced and 5G technologies. His research interests are in the area of digital communications, signal processing and wireless communications. He is a Fellow of IEEE and co-author of the book titled "Essentials of LTE and LTE-A".

Vincent D. Park's bio appears on Page 16.

Shaun Kirby is Chief Technologist for Rapid Prototyping in the IoT Vertical Solutions Group at Cisco, responsible for sensing and evangelizing technology trends that will disrupt and transform business. Working across industries, he incubates game-changing solutions to propel customers ahead of the curve, while leading the interlock between the field and Cisco Engineering and Research and Development. Before joining Cisco, Kirby served as the Chief Architect for Vitria Professional Services team and has served as a trusted advisor to CIOs, CTOs, and other technology executives, beginning as a management consultant at Deloitte. He has authored articles and presentations on a wide range of topics, including sensor fusion, augmented reality, and contactless gesture interfaces and holds several patents and patents pending in these areas. Kirby holds a B.S. in Electrical Engineering and Engineering Physics from Princeton University, and a M.S. and Ph.D. in Physics from the California Institute of Technology.

Muthaiah Venkatachalam is a top technology innovator at Intel and the architect of the most successful Intel NPU. He is currently the director of technology management for Intel's 5G partnerships in the industry. He also leads Intel's standardization efforts in 3GPP SA/CT and adjacent SDOs driving network transformation.

Wednesday 21 September 2016, 11:00–12:30 (Salon Bonaventure et Terrace)
IoT/M2M integration and design in 5G: Service, Technology and Customer aspect
Moderator: **Haris Gacanin, Preben Mogensen,** *Nokia*
Panelists: **Sunil Vadgama** *Head of Future Networking Research, Fujitsu Laboratories of Europe*
Maziar Nekovee *5G Group Leader/Chief Engineer, Samsung*

The aim of this session is to bring different dimensions to the traditional thinking of the design and operational aspects of IoT/M2M integration and design in 5G networks. The session focus to outline the associated research challenges related to service, technology and customer designs of IoT/M2M in 5G networks. An overview of implementation timelines, key technologies, and future services for 5G networks related to IoT markets such as use cases of massive MTC and Ultra Reliable Low latency communication.

Haris Gačanin's bio appears on Page 14.

Preben Mogensen received his M.Sc. and Ph.D. degrees from Aalborg University in 1988 and 1996, respectively. Since 2000, he has been a professor at Aalborg University and leading the Wireless Communication Networks (WCN) Section. He has co-authored more than 300 papers in various domains of wireless communication. Since 1995 Preben Mogensen has also been part time associated with Nokia; currently in a position of Principal Engineer in Nokia – Bell Labs. His current research focus is on 5G and MTC/IoT.

Sunil Vadgama heads FLE's research in 5G and IoT . He is a member of Strategic Advisory Board of 5G Innovation Centre hosted at University of Surrey. Additionally, his responsibilities include a portfolio of EU H2020 collaborative research projects in smart energy, network edge computing, and internet of things. Previously, has led a number of diverse communications research projects including 3G, LTE, WiMAX, sensor networks and self-optimising networks at FLE. Over last 20 years has been an active participant in 3G and 4G standardisation committees of ETSI, 3GPP and IEEE. In addition to Fujitsu's own internal R&D projects, he has been actively involved in number of collaborative research projects both EU funded as well as UK/EPSRC funded projects & programmes. He graduated in 1984 from Univ of Surrey. In 1984 joined Philips Research Labs where he was engaged in R&D of energy efficient TV transmission systems and 3rd generation mobile communications systems. In 1991 joined Fujitsu (UK) where initial work focused on R&D of GSM handsets and Advanced Beam-forming Antenna Systems for 3G. From 2001 he moved to Fujitsu Laboratories of Europe.

Dr Maziar Nekovee is a Group Leader and Chief Engineer at Samsung Electronics R&D Institute UK (SRUK) where he leads Samsung's European Research and Collaborations in next generation mobile communication systems (5G), including industry-led research within the EU's Horizon 2020 5G PPP and UKs 5GIC initiative. He also represents the devices terminal and smart card sectors in the EUs 5G Infrastructure Association. Prior to joining Samsung in 2013 he was from 2001 with BT (British Telecom) where he pioneered and led research in cognitive radio, white space and dynamic spectrum sharing technologies, with applications to affordable broadband wireless access and M2M/IoT, and provided consultancy on wireless technologies and 4G spectrum auction to strategy and business units. In addition to his experience in telecom and mobile industry, Maziar has over 15 years of experience of leading and conducting university research, and collaborations with universities in the UK, Europe, the United States, China and Korea.

Wednesday 21 September 2016, 14:00–15:30 (Salon Bonaventure et Terrace)
Urban Mobility and Smart Cities

Moderator:	**Chris Borroni-Bird**	*VP, Strategic Development, Qualcomm*
Panelists:	**Susan Zielinski**	*Managing Director, SMART, University of Michigan*
	George Wong	*Director, Business Development, Smart Cities, Qualcomm*
	Jean-François Tremblay	*Mobility Innovation Group Leader, EY*
	Paul Pebbles	*Chief of Technology–Urban Active portfolio, General Motors*

Developments in electrification, connectivity and automation not only promise to transform the automobile but also mobility, particularly in urban environments. This session will address technological developments and the impact these may have on how people move around in future cities and how mobility and its associated infrastructure can be provided if the public and private sector work together.

Dr. Chris Borroni-Bird joined Qualcomm Technologies Inc. as a VP of Strategic Development in August 2012 and is responsible for developing and implementing a transportation vision around wireless technologies (both wireless power for electric vehicles and wireless communications between vehicles). Prior to this, Dr. Borroni-Bird was GM's Director of Advanced Technology Vehicle Concepts and Electric Networked Vehicle (EN-V) Program. The EN-V concepts are small battery powered urban mobility vehicles that can be driven autonomously and were demonstrated extensively at the 2010 Shanghai World Expo. Chris was selected as one of Automotive News' Electrifying 100 in 2011. He also led GM's Autonomy, Hy-wire and Sequel "skateboard" vehicle concepts. Before joining GM in 2000, he led Chrysler's gasoline fuel cell vehicle development and was inducted into the Automotive Hall of Fame as a Young Leader in 2000. Dr. Borroni-Bird is co-author of "Reinventing the Automobile: Personal Urban Mobility for the 21st Century", with Larry Burns and the late Bill Mitchell, that was published by MIT Press in 2010.

Susan Zielinski is Managing Director of SMART (Sustainable Mobility & Accessibility Research & Transformation) at the University of Michigan. In 2006 she was engaged to develop and fulfill SMART's mission to build research, education, tech transfer, and a multi-sector, multi-disciplinary learning community as catalyst for transforming transportation and the emerging New Mobility industry that supplies it. Before joining SMART she spent a year as a Harvard Loeb Fellow focused on New Mobility innovation and leadership. Before that, she spent 15 years at the City of Toronto developing programs and policies advancing innovative, integrative, sustainable transport; healthy cities, green tourism, and green industry and economic development. While at the City she developed "Moving the Economy" (MTE), a "link tank" advancing regional New Mobility integration, innovation, and economic development. There she initiated the first international MTE summit in 1998 and then commissioned the first formal open study on the emerging global New Mobility industry. She has worked with a wide range of groups and businesses, including Ford Motor Company, the World Economic Forum, the World Business Council on Sustainable Development, the OECD International Transport Forum Innovation Award jury, the National Academy of Sciences, the Transportation Research Board, and more.

George Wong is Director, Business Development, Smart Cities, at Qualcomm Technologies, Inc. In his role, he is responsible for transportation, energy and water related initiatives for the Smart Cities team. Wong joined Qualcomm Atheros in 2012 managing the latest advanced 802.11 ac Wi-Fi portfolio. Prior to Qualcomm, Wong led high density multi-Terabit Ethernet switch marketing for Broadcom.In addition to the extensive experience in the semiconductor space, Wong served in marketing and product management leadership roles at both startup and established system networking companies such as Juniper, Nortel and Coppercom. Wong holds an MBA from Pepperdine University, MS in Engineering from Cal State Los Angeles and BS in Engineering from University of Pennsylvania.

Jean-François Tremblay is part of the EY Global Automotive and Transportation Center initiative that focuses on issues and technologies gradually shifting the automotive industry towards a business addressing broader mobility needs. As team member of this initiative, Jean-François supports client projects with companies, cities, and governments around the world to identify current and prospective opportunities emerging from the automotive market transition principally driven by the introduction of vehicle connectivity. Jean-François leads EY's effort on the Urban Mobility Infrastructure (UMI) index, a tool designed to asses how cities can best articulate their mobility needs based on their strengths and weaknesses, thereby creating communication platform with vehicle manufacturers.

In his role, Jean-François comes across a broad range of new value propositions contributing to the evolving mobility value chain. For instance: revenue generating vehicle-to-grid applications, start ups proposing a white space solution, governments and city administrations implementing regional strategies to incentivize more energy and traffic friendly behaviours, vehicle manufacturers reconsidering their role in the world of transportation through the means of connected vehicle technologies. Jean-François holds an Executive MBA from the University of Michigan, USA (2012).

Paul Pebbles is the chief of technology for General Motors' Urban Active portfolio, leading development of mobile, web and vehicle technologies for the Maven car-sharing brand. Paul manages development of global connectivity roadmaps and evaluates technology for partnerships to develop GM's long-term vehicle connectivity strategy. Paul joined GM in 1999 and has held a series of positions in marketing, product development, IT implementation and program management. Paul led product development on a number of GM vehicle connectivity services including the OnStar RemoteLink App and MyVolt.com. Previously, he worked for Motorola on automotive control modules and managed engineering of the Iridium Satellite Phone, which connects to a system of 66 satellites for worldwide voice and data communication. Paul also worked at Amphenol engineering connectors for the International Space Station. Paul earned an associate's degree in engineering science from the Alfred State University of New York College of Technology and a bachelor's degree in mechanical engineering from Rensselaer Polytechnic Institute. He also earned a master's degree in business administration from Northwestern University's Kellogg School of Management in 1999. Paul holds several patents for vehicle connectivity solutions.

Unmanned Aerial Vehicles (UAVs or Drones): Challenges Towards Mass Adoption

Moderators: **Ravi Pragada, Tanbir Haque,** *InterDigital*

Panelists: **Kyle Snyder,** *Director, NGAT Center @ ITRE*

                    Paul McDuffee, *Vice President, Government Relations @ Insitu*

                    Kamesh Namuduri, *Associate Professor, University of North Texas*

                    Manish Kumar, *Associate Professor, University of Cincinnati*

Ravi Pragada is a Principal Engineer at InterDigital Labs where he is currently research related to unmanned systems and related technologies. He has actively contributed to and held leadership positions in various next generation cellular system projects viz., millimeter wave air-interface design and development, device-to-device communications, millimeter wave backhaul and beyond 4G architectures. He also held engineering positions in product development including lead software architect for HSPA/UMTS and LTE protocol stack development projects covering handset and infrastructure products. He is a recipient of numerous innovation awards and Lucy Mahjobian distinguished publication award. Prior to InterDigital he has part of Motorola team (Arlington Heights, IL) that has developed RNC and NodeB infrastructure for 3GPP UMTS system. He received his M.S. in computer science and engineering from the State University of New York at Buffalo (1999) and B.E. from Andhra University, India.

Tanbir Haque is a Principal Engineer with the Technology Evolution and Prototyping department at InterDigital Labs. His current responsibilities include technology incubation, technology road mapping and university relations development. During his 16 year tenure at InterDigital, Tanbir has developed numerous radio reference designs and technology platforms. His research interests include electronics, signal processing and system level techniques for communication and sensing applications. Prior to joining InterDigital in 2000, Tanbir was a Senior RF Engineer with the Wireless Technology Center at Motorola, Libertyville, IL and an Associate Staff Engineer with the Relativistic Heavy Ion Collider Department at Brookhaven National Laboratory, Upton, NY. Tanbir received the B.S. and M.S. degree in electrical engineering and the M.S. degree in applied mathematics from the State University of New York at Stony Brook, NY, Polytechnic University, Brooklyn, NY, and Columbia University, New York, NY. He holds 11 patents granted in the U.S. and several others under review.

In 2012 **Kyle Snyder** returned home to North Carolina to lead the development of an Unmanned Aircraft Systems (UAS) Ecosystem as part of an effort to transition the state to a modern air transportation system. Through his experiences in industry, academia, government, and the non-profit sector, Kyle has developed a unique perspective and skill set for transitioning new aviation technologies from research laboratories and prototype phases into operational products. In the role as the NGAT Program Director, Kyle is reaching across North Carolina to connect researchers and educators with industry and government offices that are preparing for future aviation capabilities. Having seen the initial Space Shuttle launches from his backyard as kid, to standing on the flight line for a couple of the last SR-71 flights at NASA Dryden, to being a driving force in the domestic integration of UAS for civil and commercial operations, Kyle continues to be inspired by science of flight and seeks to share those moments with those around him (especially his wife and young son!). Kyle received his M.B.A in Aerospace from University of Tennessee, M.S. in Mathematics from University of Tennessee Space Institute, Tullahoma and B.A. in Mathematics, Computer Science from Catawba College, Salisbury, NC.

Paul McDuffee is Insitu's vice president of government relations responsible for regulation shaping and development supporting Insitu's future in civilian and commercial use of unmanned aircraft. Paul serves as principal liaison with FAA in matters relating to regulatory matters for UAS operations and as advocate for UAS national airspace integration. Paul's involvement in UAS regulatory development is extensive. Prior to joining Insitu in 2006, he transitioned from a 30 year career in academia as a full professor, Chief Pilot and Vice President of Aviation Training at Embry Riddle Aeronautical University. He joined Insitu as Vice President of Flight Operations and Training before moving on to his current role. He currently serves on the AUVSI Board of Directors and is also AUVSI's technical representative to the ICAO RPAS Panel. Paul was a charter member of the FAA's small Unmanned Aircraft System Aviation Rulemaking Committee and is a current member of the FAA UAS Aviation Rulemaking Committee. He is currently serving as co-chair of RTCA Special Committee 228 chartered by FAA to establish performance standards for UAS command and control and detect and avoid solutions. Paul recently ended his term as chair of the Aeronautical Industries Association UAS Committee.

Paul is an active pilot holding Airline Transport Pilot and Flight Instructor Certificates, with jet type ratings, and has logged over 8000 flight hours. Paul holds both a Bachelors and Masters degree in Aeronautical Science from Embry-Riddle Aeronautical University.

Kamesh Namuduri received his B.S. degree in Electronics and Communication Engineering from Osmania University, India, in 1984, M.S. degree in Computer Science from University of Hyderabad in 1986, and Ph.D. degree in Computer Science and Engineering from University of South Florida in 1992. Currently, he is with the Electrical Engineering Department at University of North Texas as an Associate Professor. Over the past eight years, his research is focused on aerial networking and communications. Along with several colleagues, he has been organizing a series of workshops in this domain since 2011. He is serving as the chair for the newly formed IEEE Standards Working Group (IEEE 1920.1: Aerial Communications and Networking Standards). He is serving as a co-editor for an upcoming book on "Unmanned Aerial Vehicle Networks" that will be published by the Cambridge University Press in fall 2016. He has published over one hundred research articles during his career. He is leading the Smart and Connected Community project on "Deployable Communication Systems" in collaboration with the Government, public, and private organizations. This project has been demonstrated twice during the Global City Teams Challenge hosted jointly by the National Institute of Standards and Technology and US Ignite in 2015 and 2016.

Manish Kumar received his Bachelor of Technology degree in Mechanical Engineering from Indian Institute of Technology, Kharagpur, India in 1998, and his M.S. and Ph.D. degrees in Mechanical Engineering from Duke University, NC, USA in 2002 and 2004 respectively. After finishing his Ph.D., he served as a postdoctoral researcher in the Department of Mechanical Engineering and Materials Science at Duke University, the US Army Research Office, and General Robotics, Automation,

Sensing, and Perception (GRASP) laboratory at the University of Pennsylvania, PA, USA. Subsequently, he worked as an Assistant Professor in the School of Dynamic Systems at the University of Cincinnati, OH, USA where he directed the Cooperative Distributed Systems (CDS) Laboratory and co-directed the Center for Robotics Research. After working as Associate Professor in the Department of Mechanical, Industrial, and Manufacturing Engineering in the University of Toledo, OH, USA for three years, he returned back to the University of Cincinnati (UC) where he is currently Associate Professor in the Department of Mechanical and Materials Engineering. At UC, he directs Cooperative Distributed Systems lab and Collaboratory

for Medical Innovation and Implementation (CMII), and co-directs UAV Multi Agent Systems Research (UAV-MASTER) lab. He has served as a Principal Investigator on several National Science Foundation (NSF), Department of Defense (DoD), and industrial projects related to Unmanned Aerial Vehicles, robotics, decision-making and control in complex systems, multi-sensor data fusion, swarm systems, and multiple robot coordination and control. He is a member of the American Society of Mechanical Engineers (ASME), Co-chair of the Robotics Technical Committee of the ASME's Dynamic Systems and Control Division, and Associate Editor of ASME Journal of Dynamic Systems, Measurements and Control.

Tutorials

A range of tutorials will be held on Sunday 18 September given by experts from industry and academia.

Sunday 18 September 2016 8:30–12:00 Fontaine D
T1: Stochastic Geometry-Based Modeling and Analysis of 5G Wireless Networks
Ekram Hossain (University of Manitoba, Canada)

Recently, stochastic geometry models have been shown to provide tractable and accurate performance bounds for cellular wireless networks including multi-tier and cognitive cellular networks, underlay device-to-device (D2D) communications, energy harvesting-based communication, coordinated multipoint transmission (CoMP) transmissions, full-duplex (FD) communications, etc. These technologies will enable the evolving fifth generation (5G) cellular networks. Stochastic geometry, the theory of point processes in particular, can capture the location-dependent interactions among the coexisting network entities. It provides a rich set of mathematical tools to model and analyze cellular networks with different types of cells (e.g., macro cell, micro cell, pico cell, or femto cell) with different characteristics, in terms of several key performance indicators such as SINR coverage probability, link capacity, and network capacity. This tutorial will provide an extensive overview of the stochastic geometry modeling approaches for next-generation cellular networks, and the state-of-the-art research on this topic. After motivating the requirement for spatial modeling for the evolving 5G cellular networks, the basics of stochastic geometry modeling tools and the related mathematical preliminaries will be discussed. Then, a comprehensive survey on the literature related to stochastic geometry models for single-tier as well as multi-tier and cognitive cellular networks and underlay D2D communications will be presented. Then, a taxonomy of the stochastic geometry modeling approaches based on the target network model, the point process used, and the performance evaluation technique will be discussed.

Ekram Hossain (F'15) is currently a Professor in the Department of Electrical and Computer Engineering at University of Manitoba, Winnipeg, Canada. His current research interests include modeling, design, and analysis of wireless networks with emphasis on 5G cellular networks, cooperative and cognitive wireless systems, and green radio communications. He is an author/editor of several books in these areas. He has been selected as a Distinguished Lecturer of the IEEE Vehicular Technology Society for the term 2016-2017.

Sunday 18 September 2016 8:30–12:00 Fontaine E
T3: Rate Splitting for MIMO Wireless Networks: A Promising PHY-Layer Strategy for 5G
Bruno Clerckx, Hamdi Joudeh (Imperial College London, UK)

MIMO processing plays a central part towards the recent increase in spectral efficiencies of wireless networks. MIMO has grown beyond the original point-to-point channel and nowadays refers to a diverse range of centralized and distributed deployments. The fundamental bottleneck towards enormous spectral efficiencies in multiuser MIMO networks lies in a huge demand for accurate channel state information at the transmitter (CSIT). This has become increasingly difficult to satisfy due to the increasing number of antennas and access points in 5G networks relying on dense heterogeneous networks and

transmitters equipped with a large number of antennas. CSIT inaccuracy results in a multi-user interference problem that is the primary bottleneck of MIMO wireless networks. Looking backward, the problem has been to strive to apply techniques designed for perfect CSIT to scenarios with imperfect CSIT. This tutorial departs from this conventional approach and introduces the audience to a promising strategy based on rate-splitting. Rate-splitting relies on the transmission of common messages (decoded by multiple users) and private messages (decoded by their corresponding users). This strategy is shown to provide significant benefits in terms of spectral efficiencies, reliability and CSI feedback overhead reduction over conventional strategies used in LTE-A and exclusively relying on private messages. The benefits of rate-splitting will be further demonstrated in a wide range of scenarios: multi-user MIMO, massive MIMO, multi-cell MIMO, overloaded systems, Non-Orthogonal Multiple Access (NOMA), multigroup multicast and caching. Open problems, impact on standard specifications and operational challenges will also be discussed.

Bruno Clerckx is a Senior Lecturer (Associate Professor) in the Electrical and Electronic Engineering Department at Imperial College London (London, United Kingdom). He received his M.S. and Ph.D. degree in applied science from the Université catholique de Louvain (Louvain-la-Neuve, Belgium) in 2000 and 2005, respectively. From 2006 to 2011, he was with Samsung Electronics (Suwon, South Korea) where he actively contributed to 3GPP LTE/LTE-A and IEEE 802.16m and acted as the rapporteur for the 3GPP Coordinated Multi-Point (CoMP) Study Item. Since 2011, he has been with Imperial College London, first a Lecturer (Assistant Professor) and now as a Senior Lecturer. Since March 2014, he also occupies an Associate Professor position at Korea University, Seoul, Korea. He also held visiting research positions at Stanford University (CA, USA), EURECOM (Sophia-Antipolis, France) and National University of Singapore (Singapore).

He is the author of 2 books, 110 peer-reviewed international research papers, 150 standard contributions and the inventor of 75 issued or pending patents among which 15 have been adopted in the specifications of 4G (3GPP LTE/LTE-A and IEEE 802.16m) standards. Dr. Clerckx served as an editor for IEEE Transactions on Communications from 2011-2015 and is currently an editor for IEEE Transactions on Wireless Communications. His area of expertise is communication theory and signal processing for wireless networks.

Hamdi Joudeh is a post-doctoral research associate in the Communications and Signal Processing (CSP) Group, Department of Electrical and Electronic Engineering at Imperial College London. He obtained his BSc in Electrical Engineering from the Islamic University of Gaza in 2010 and his MSc and PhD in Communications and Signal Processing from Imperial College London in 2011 and 2016, respectively. During the autumn of 2011, he was with the Mobile Communication Division at Samsung Electronics, Suwon, South Korea, as an engineering intern. His research interests include signal processing and optimization for wireless communication systems, and communication theory.

T4: Non-orthogonal Multiple Access: Evolution towards 5G and B5G Cellular Networks
Zhiguo Ding (Lancaster University, UK)

Multiple access in 5G mobile networks is an emerging research topic, since it is key for the next generation network to keep pace with the exponential growth of mobile data and multimedia traffic. Non-orthogonal multiple access (NOMA) has recently received considerable attention as a promising candidate for 5G multiple access. The key idea of NOMA is to exploit the power domain for multiple access, which means multiple users can be served concurrently at the same time, frequency, and spreading code. Instead of using water-filling power allocation strategies, NOMA allocates more power to the users with poorer channel conditions, with the aim to facilitate a balanced tradeoff between system throughput and user fairness. Recent industrial demonstrations show that the use of NOMA can significantly improve the spectral efficiency of mobile networks. Because of such a superior performance, NOMA has been also recently proposed for downlink scenarios in 3rd generation partnership project long-term evolution (3GPP-LTE) systems, and the considering technique was termed multiuser superposition transmission (MUST). In this tutorial, we will provide a progress review for NOMA, including an information theoretic perspective of NOMA, the interaction between cognitive radio and NOMA, the design of MIMO and cooperative NOMA, and the impact of practical constraints, such as imperfect channel state information and limited feedback, on the performance of NOMA.

Zhiguo Ding received his B.Eng in Electrical Engineering from the Beijing University of Posts and Telecommunications in 2000, and the Ph.D degree in Electrical Engineering from Imperial College London in 2005. From Jul. 2005 to Aug. 2014, he was working in Queen's University Belfast, Imperial College and Newcastle University. Since Sept. 2014, he has been with Lancaster University as a Chair Professor in Signal Processing. From Sept. 2012 to Sept. 2016, he is also an academic visitor in Princeton University working with Prof. Vincent Poor.

Dr Ding' research interests are 5G networks, game theory, cooperative and energy harvesting networks and statistical signal processing. He is serving as an Editor for IEEE Transactions on Communications, IEEE Transactions on Vehicular Networks, IEEE Wireless Communication Letters, IEEE Communication Letters, and Journal of Wireless Communications and Mobile Computing. He was the TPC Co-Chair for the 6th IET International Conference on Wireless, Mobile & Multimedia Networks (ICWMMN2015), Symposium Chair for International Conference on Computing, Networking and Communications (ICNC 2016), and the 25th Wireless and Optical Communication Conference (WOCC), and Co-Chair of WCNC-2013 Workshop on New Advances for Physical Layer Network Coding. He received the best paper award in IET Comm. Conf. on Wireless, Mobile and Computing, 2009 and the 2015 International Conference on Wireless Communications and Signal Processing (WCSP 2015), IEEE Communication Letter Exemplary Reviewer 2012, and the EU Marie Curie Fellowship 2012-2014.

T5: Enabling Technologies for Next Generation Mobile Communications
Lajos Hanzo (University of Southampton, UK) and Lingyang Song (Peking University, China)

Mobile data traffic, especially mobile video traffic and small-size IoT packets, has dramatically increased in recent years with the emergence of smart phones, tablets, and various new applications. It is hence crucial to increase network capacity to accommodate these bandwidth consuming applications and services. New technologies such as multicarrier communications, cooperative relaying, full-duplex radios, and device-to-device communication networks, have been recently introduced, such that the mobile users can obtain satisfactory services. The main of this tutorial is to present the basic concepts/theories, address research advances on key technologies, and deliver the state-of-the-art of research and development for next generation mobile communication systems.

Lajos Hanzo, Royal Society Wolfson Fellow, 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 40-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 100+ PhD students, co-authored 20 John Wiley/IEEE Press books on mobile radio communications totalling in excess of 10 000 pages, published 1500+ 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.

Lingyang Song received his PhD from the University of York, UK, in 2007, where he received the K. M. Stott Prize for excellent research. He worked as a postdoctoral research fellow at the University of Oslo, Norway, and Harvard University, until rejoining Philips Research UK in March 2008. In May 2009, he joined the School of Electronics Engineering and Computer Science, Peking University, China, as a full professor. He wrote 6 text books, and is co-inventor of a number of patents (standard contributions). He received eight paper awards in IEEE international conferences including IEEE WCNC 2012, ICC 2014, Globecom 2014, and ICC 2015. He is currently on the Editorial Board of IEEE Transactions on Wireless Communications. He is the recipient of 2012 IEEE Asia Pacific (AP) Young Researcher Award. Dr. Song is a senior member of IEEE, and IEEE ComSoc distinguished lecturer since 2015.

T7: Fog Networks for Vehicular Applications and Low-Latency 5G IoT
Hung-Yu Wei (National Taiwan University) Tao Zhang (Cisco Systems) Ai-Chun Pang (National Taiwan University)

Low-latency applications have been envisioned to play key roles in the 5G environments. The ultra low-latency operations of communications and computing enable many potential mission-critical IoT applications and thus have gained widespread attention. Emerging 5G services, such as Tactile Internet, intelligent transportation system, and augment reality, require low latency support from communications infrastructure. Providing low end-to-end latency communications require integrated system design approach. Pushing communication and computing processing to network edge leads lower latency. Fog networking is a promising approach to provide low-latency services. In this tutorial, we will first discuss some of the system architecture. Recent research advances in MEC (Mobile Edge Computing) and Fog-RAN (Fog-based Radio Access Network) applied computing paradigm along with the next generation RAN design to meet the low-latency application demands in 5G. Edge computing resource in RAN could be used to for low latency computation jobs. Moreover, diverse application requirements are expected in the 5G era. Flexible radio access network design is needed to serve mixed low-latency and delay-tolerant traffic. An adaptive Fog-RAN resource allocation scheme is proposed for efficient utilization of edge computing resource in diverse traffic scenarios. In the emerging mission-critical IoT services, secure system design will be very important. Additionally, we will discuss the security threats and countermeasures in the new Fog Networking paradigm. Secure fog networking design paradigm will be illustrated in the vehicular communications and intelligent transportation systems.

Hung-Yu Wei is currently a Professor with the Department of Electrical Engineering and Graduate Institute of Communication Engineering at National Taiwan University. He was a consulting member of the Acts and Regulation Committee of the National Communications Commission during 2008-2009. He actively participates in wireless communications standardization activities. He was the recipient of KT Li Young Researcher Award from ACM Taipei Chapter and IICM, CIEE Excellent Young Engineer Award and the NTU Excellent Teaching Award. Currently, he is the chair of IEEE Vehicular Technology Society Taipei Chapter. He also serves as an associate editor for IEEE IoT journal.

Time	#	LaSalle (A)	Loungueuil (B)	Fontaine C (C)	Fontaine D (D)	Fontaine E (E)	Fontaine F (F)	Fontaine G (G)	Fontaine H (H)	Fundy (I)	Fontaine A & B (P)	Salon Bonaventure et Terrace (Industry Track)
SUNDAY 18 September												
7:30-17:30		Registration (Inscription)										
8:30-17:00		Tutorials and Workshops (SEE SEPARATE PROGRAM)										
18:00-20:00		Welcome Reception (Salon Bonaventure)										
MONDAY 19 September												
7:30-17:30		Registration (Inscription)										
8:30-9:30		Welcome: Pierre Boucher and Fabrice Labeau, General Co-chairs, François Gagnon and Weihua Zhuang, TPC Chairs, Javier Gozalvez, VTS President (Ballroom Outremont-Westmount-Mount Royal-Hampstead-Cote St-Luc)										
9:30-10:30		Keynote: **5G Physical Layer: Technology Opportunities and Challenges.** Reinaldo. A. Valenzuela Director, Communications Theory Research Dept. Bell Labs, Alcatel-Lucent										
10:30-11:00		Refreshments (Fontaine B)										
11:00-12:30	(1)	5G I	D2D I	TV White Space	Multiuser Detection	Vehicular Communications	OFDM	Resource Allocation I	MIMO I	WWRF Workshop: the Internet of Everything (Verdun)	Signal Transmission and Reception Posters I	Customer, Service and Network Design in 5G
12:30-14:00		Lunch (Ballroom: Outremont-Westmount-Mount Royal-Hampstead-Cote St-Luc)										
14:00-15:30	(2)	Small Cells	Cognitive Radio Networks	RF Systems and Design	Vehicular Networks - MAC	Radio Access	Optical and Visible Light Communication	Massive MIMO I	**MathWorks Workshop: Wireless Design with MATLAB**	WWRF Workshop: the Internet of Everything (Verdun)	Signal Transmission and Reception Posters II	5G Architecture: to Implementation
15:30-16:00		Refreshments & Exhibits (Fontaine B)										
16:00-17:30	(3)	Cooperative Communication I	Energy Harvesting and Efficiency	Blind Sensing	Green Wireless Networking I	Vehicular Networks - Network Layer	Heterogeneous Networks I	Modulation	Full-Duplex Communication	WWRF Workshop: the Internet of Everything (Verdun)	Signal Transmission and Reception Posters III	LTE Advanced Pro
18:00-21:30		VTC2016-Fall Banquet, Windsor Hotel										
TUESDAY 20 September												
7:30-17:30		Registration (Inscription)										
9:00-9:45		Keynote: **Channels and systems for wireless communications in high-mobility environments.** Andy Molisch, USC (Ballroom Outremont-Westmount-Mount Royal-Hampstead-Cote St-Luc)										
9:45-10:30		Keynote: **Networked Society and 5G.** Jaco du Plooy, Ericsson (Ballroom Outremont-Westmount-Mount Royal-Hampstead-Cote St-Luc)										
10:30-11:00		Refreshments & Exhibits (Fontaine B)										
11:00-12:30	(4)	Millimeter Wave Communication	LTE I	Positioning and Tracking I	Spectrum Sensing I	Network Security	SDN	Network Performance Evaluation	Wireless Power Transfer	Coding	Vehicular Networks Posters	Future Connected Vehicles: 5G vs. DSRC V2X
12:30-14:00		Awards Luncheon (Ballroom: Outremont-Westmount-Mount Royal-Hampstead-Cote St-Luc)										
14:00-15:30	(5)	Channel characterization	5G II	Spectrum Management I	Cooperative communication II	Positioning and Tracking II	Beamforming I	Non-orthogonal Multiple Access	Resource Allocation II		Wireless Networks Posters I	5G Broadcast Convergence / 5G for Vehicle IoT
15:30-16:00		Refreshments & Exhibits (Fontaine B)										
16:00-17:30	(6)	Multiuser MIMO	D2D II	Transmission Performance Analysis	Green Wireless Networking II	Vehicular Networks - Positioning	Content Distribution	Diversity	Routing		Wireless Networks Posters II	Mission-Critical 5G for Vehicle IoT
17:30-19:30		Young Professionals Publication Seminar (Ballroom Outremont-Westmount-Mount Royal-Hampstead-Cote St-Luc). Registration required - see https://meetings.vtools.ieee.org/m/41031										
18:00-20:00		Exclusive Reception for VTS Members										
WEDNESDAY 21 September												
7:30-17:30		Registration (Inscription)										
9:00-9:45		Keynote: **Sustainable Spectrum Management for Vehicular Technology.** Jean-Luc Berube, CRC (Ballroom Outremont-Westmount-Mount Royal-Hampstead-Cote St-Luc)										
9:45-10:30		Panel: **Where is 5G Leading Us?** Moderator: Charles Despins; Panelists: Håkan Andersson, Ericsson; Peijing Zhu, Huawei										
10:30-11:00		Refreshments & Exhibits (Fontaine B)										
11:00-12:30	(7)	Full Duplex Systems	Channel modeling	Spectrum Sensing II	Energy Efficient Transmission	Cloud and Smart Grid	Vehicular Networks - Protocols	Vehicular Electronics and Machines	Cellular Networks	Positioning in Transportation	Multiple Antenna Systems & Cooperative Comms Posters	IoT/M2M integration & design in 5G: Service, Technology & Customers
12:30-14:00		Lunch (Ballroom: Outremont-Westmount-Mount Royal-Hampstead-Cote St-Luc)										
14:00-15:30	(8)	Massive MIMO II	Beamforming II	Spectrum Management II	Heterogeneous Networks II	M2M	LTE II	Vehicle Sensing and Perception	Resource Allocation III	Localization in Ad Hoc Networks	Radio Access Posters	Urban Mobility and Smart Cities
15:30-16:00		Refreshments (Fontaine B)										
16:00-17:30	(9)	5G III	Cooperative Communication III	Wideband Sensing	MIMO II	3D and Spatial Channel Modeling	Physical Layer Security	Vehicle Control for Traffic Safety	Vehicular Networks - Applications	Indoor Localization and Tracking		Unmanned Aerial Vehicles

Dr. Tao Zhang, an IEEE Fellow and Cisco Distinguished Engineer, joined Cisco in 2012 as the Chief Scientist for Smart Connected Vehicles, and has since also been leading initiatives to develop strategies, architectures, technology, and eco-systems for the Internet of Things (IoT) and Fog Computing. Prior to Cisco, he was Chief Scientist and Director of Mobile and Vehicular Networking at Telcordia Technologies (formerly Bell Communications Research or Bellcore). For over 25 years, Tao has been in various technical and executive positions, directing research and product development in vehicular, mobile, and broadband networks and applications. He is serving on the Board of Governors and as the CIO of the IEEE Communications Society. He was a founding Board Director of the Connected Vehicle Trade Association (CVTA). He was a co-founder of the IEEE Communications Society Technical Sub-Committee on Vehicular Networks and Telematics Applications and served as its Chair from 2013 – 2015. He is a founding steering committee member of the IEEE Symposium on Edge Computing and the IEEE International Conference on Collaboration and Internet Computing. He is IEEE VTS Distinguished Lecturer.

Ai-Chun Pang is now Professor and the Director of the Graduate Institute of Networking and Multimedia (INM) in National Taiwan University. Her research interests include the design and analysis of wireless and multimedia networking. She is a co-author of the book Wireless and Mobile All-IP Networks published by Wiley. She received the Outstanding Teaching Award at NTU, the Investigative Research Award of Pan Wen Yuan Foundation, Wu Ta You Memorial Award of NSC, Excellent Young Engineer Award from CIEE. She also receives the Republic of China Distinguished Women Medal in 2009.

Sunday 18 September 2016 13:30–17:00 Fontaine H
T10: Vehicular Networks – The Story Today and Tomorrow
Harita Joshi, WMG, University of Warwick, UK

The modern automotive depends on fast, reliable and robust Vehicular Networks for delivering high end performance, features and functionalities. The evolution in electrical architecture of the vehicle along with developments in Advanced Driver Assist Systems (ADAS) and Connected Car technologies demand a unique set of characteristics from automotive communication systems.

In this tutorial, we start off with an aim to explore the state-of-the-art in automotive networks, various factors affecting the choice of a particular network technology and identifying an optimum network architecture for a vehicle with a given set of high end features.

Building up on current vehicular communication platforms, we then lead on to new concepts and potential developments for future Vehicular Networks including Automotive Ethernet alongside role of wireless communication technologies including DSRC, LTE and beyond for ADAS and Connected Car applications. We also explore applications of some niche communication technologies such as optical wireless within the automotive domain.

The tutorial is designed to be an actively engaging session with example case scenarios to illustrate the concepts.

Dr Harita Joshi is a member of Energy and Electrical Systems Group led by Prof Paul Jennings at WMG, The University of Warwick. With a PhD in Optical Wireless Communications alongside several research projects focusing on secure wireless communications in collaboration with industrial partners such as Thales and Qinetiq, Harita is currently looking into advanced automotive networks and minimal-latency highly-reliable communications around the Connected Car.

Sunday 18 September 2016 13:30–17:00 Loungueil
T12: Millimeter Wave Communications for Connected Vehicles
Takayuki Shimizu (TOYOTA InfoTechnology Center), Robert W. Heath Jr. (University of Texas at Austin)

Communication at millimeter wave (mmWave) frequencies is defining a new era of wireless communication. The mmWave band relieves spectral gridlock at lower frequencies by offering much higher bandwidth communication channels than presently used in commercial wireless systems. The next generation of wireless local area networks is exploiting

the mmWave unlicensed band at 60 GHz to provide multi-gigabit-persecond data rates. There is also growing interest in using mmWave licensed spectrum for 5G cellular systems at other mmWave frequencies. The potential for mmWave is immense.

The large spectral channels at mmWave frequencies provide a means of achieving much higher data rates in vehicular communication systems. High data rates can be used for exchanging low-level sensing data (i.e., without much processing) or for infotainment applications to improve traffic safety and efficiency as well as user experience onboard.

This tutorial provides an overview of mmWave vehicular communication with an emphasis on results on channel measurements, the physical (PHY) layer, and the medium access control (MAC) layer. The main objective is to summarize key findings in each area, with special attention paid to identifying important topics of future research. In addition to surveying existing work, some new simulation results are also presented to give insights on the effect of directionality and blockage, which are the two distinguishing features of mmWave vehicular channels. A main conclusion is that given the renewed interest in high rate vehicle connectivity, many challenges remain in the design of a mmWave vehicular network.

Takayuki Shimizu is a Researcher of TOYOTA InfoTechnology Center, U.S.A., Inc. (Toyota ITC US). Since he joined Toyota ITC US in 2012, he has been working on the research of wireless vehicular communications and the development of smart grid systems for plug-in electric vehicles. He received the B.E., M.E., and Ph.D. degrees from Doshisha University, Kyoto, Japan, in 2007, 2009, and 2012, respectively. From 2009 to 2010, he was a visiting researcher at Stanford University, CA, USA. His current research interests include millimeter wave vehicular communication, vehicular communications for automated driving, and LTE/5G for vehicular applications. He is a co-author of the recently published NOW monograph entitled "Millimeter Wave Vehicular Communications: A Survey" published by NOW Publishers in 2016. He is a 3GPP standardization delegate in RAN WGs and SA1 WG. He is a member of the IEEE, IEICE, and SAE.

Robert W. Heath Jr. received the Ph.D. in EE from Stanford University. He is a Cullen Trust for Higher Education Endowed Professor in the Department of Electrical and Computer Engineering at The University of Texas at Austin and a Member of the Wireless Networking and Communications Group. He is also the President and CEO of MIMO Wireless Inc. Prof. Heath is a recipient of the 2012 Signal Processing Magazine Best Paper award, a 2013 Signal Processing Society best paper award, the 2014 EURASIP Journal on Advances in Signal Processing best paper award, and the 2014 Journal of Communications and Networks best paper award, the 2016 IEEE Communications Society Fred W. Ellersick Prize, and the IEEE Communications Society and Information Theory Society Joint Paper Award. He is a co-author of the book "Millimeter Wave Wireless Communications" published by Prentice Hall in 2014 and sole author of Digital Wireless Communication: Physical Layer Exploration Lab Using the NI USRP, National Technology and Science Press., 2012. He is a licensed Amateur Radio Operator, a registered Professional Engineer in Texas, and is a Fellow of the IEEE.

The following tutorials have been cancelled:
T2: Green Heterogeneous Wireless Networks
Muhammad Ismail, Erchin Serpedin and Khalid Qaraqe (Texas A&M University at Qatar and USA)
T6: Security for Next Generation Mobile Wireless Networks
Yi Qian (University of Nebraska-Lincoln, USA)
T8: Towards Spectrum Efficient, Energy Efficient and QoE Aware 5G Wireless Systems
Rose Qingyang Hu (Utah State University, USA)
T9: Software-Defined Radio with GNU Radio: Theory and Application
Sofiane Bounaffaa, Francois Gagnon and Georges Kaddoum, (École de technologie supérieure)

Workshops

Monday, 19 September 2016 14:00-15:30 Fontaine H

Special MathWorks' Workshop on
5G, LTE, WLAN and V2X: Wireless Design with MATLAB

Houman Zarrinkoub, *Product Manager, LTE, WLAN and Communications Systems, MathWorks*

In this workshop, you will learn about 5G, LTE, WLAN and V2X analysis and design capabilities with MATLAB.

In the first section, we use models in MATLAB to learn about various 5G technologies including
- New proposed modulation waveforms
- Multi-user MIMO designs
- Massive MIMO simulations
- Hybrid beamforming

In the 2nd section, we show how you can model, simulate and test LTE and WLAN standards in MATLAB and use these existing standards as a starting-point for development of future 5G technologies.

Finally, we will show how to use MATLAB for active areas of research such as Vehicle-to-Vehicle (V2V) and Vehicle-to-Infrastructure (V2I) applications.

Dr. Houman Zarrinkoub is a senior product manager at MathWorks, based in Massachusetts, USA. During his 15 years at MathWorks he has also served as a development manager and has been responsible for multiple signal processing and communications software tools. Prior to MathWorks, he was a research scientist in the Wireless Group at Nortel Networks, where he contributed to multiple standardization projects for 3G mobile and voice coding technologies. He has been awarded multiple patents on topics related to computer simulations of signal processing applications. Houman is the author of the book Understanding LTE with MATLAB: From Mathematical Modeling to Simulation and Prototyping (Wiley, 2014). He holds a B.Sc. degree in electrical engineering from McGill University and M.Sc. and Ph.D. degrees in telecommunications from the Institut National de la Recherche Scientifique, in Canada.

Monday, 19 September 2016 11:00-17:30 Verdun

W1: Wireless Technologies & Applications for the Internet of Everything

The Internet of Everything (IoE) is expected to bring billions of dollars in business opportunity over the next decade. The current market for communication systems enabling IoE is highly fragmented, and the revenues are being shared among multiple incumbents, many of those operating in the small and medium enterprise space. The IoE market is served by a number of wireless technology domains from Wireless Personal Area Network (WPAN) technologies for health, automation and other personal area applications, but also by wide area technologies. Both standardized and proprietary wireless solutions utilizing unlicensed Industrial, Science and Medical (ISM) bands are in use. Organized by the Wireless World Research Forum (WWRF), the goal of this workshop is to bring together the representative industry views from different wireless domains for discussion and debate on the roles, co-existence and collaboration of these wireless domains.

Program

Monday, 19 September 2016 11:00-12:30 Verdun
Session 1
Workshop Introduction
Shalini Periyalwar, Workshop Co-Chair

WWRF and IoE
Sudhir Dixit, WWRF Steering Board Member, CEO and Co-Founder, Skydoot

Spectrum Issues for IOE From International Perspective
Veena Rawat, O.C., Communications Technologies Consultant

OneNET, Big Connection
Chih-Lin I, China Mobile Chief Scientist, Wireless Technologies, China Mobile Research Institute

Monday, 19 September 2016 14:00-16:00 Verdun
Session 2
Keynote
Thierry LeStable, Vice Chair, The LoRa Alliance
Technology & Innovation Manager, SAGEMCOM

Keynote
Georgios Karagiannis, AIOTI WG-3 Co-Chair
Huawei Standardization & Industry Dept.

5G IoT Devices and System Design Considerations
Qian (Clara) Li, Standards and Advanced Technology, Intel

Coexistence of D2D/V2V with Cellular Transmissions and Multi-Link Synchronization Solutions
Konstantinos Manolakis, Huawei German Research Center

Monday, 19 September 2016 16:00-18:00 Verdun
Session 3
Integrating IOT services into end-to-end cloud-based applications
Alberto Leon-Garcia, University of Toronto

The IoT Revolution in 5G and Beyond
Halim Yanikomeroglu, Carleton University

Panel: IoE – Roles, Co-existence and Collaboration of Wireless Technologies for IoE
Moderator: Sudhir Dixit

W2: Cellular Internet of Things - Emerging Trends and Enabling Technologies

The Internet of Things (IoT) will bring about tremendous improvements in user experience and system efficiency. An estimated 50 billion connected devices will be deployed by 2020 and the total IoT revenue is expected to grow to $1.2 trillion in 2022. As a result, IoT services are expected to be a key driver for growth in the cellular industry.

The goal of the workshop is to bring together researchers from both industry and academia, cellular service providers, and industrial partners to explore IoT requirements, business case, emerging trends, potential applications, and enabling technologies. The focus of the workshop will be on the evolution of cellular technologies to support low-power wide-area IoT services, related requirements, commercial use cases, field experiments and performance results.

Organizing Committee:
Amitava Ghosh, Nokia Bell Labs
Jin Yang, Verizon Wireless
Rapeepat Ratasuk, Nokia Bell Labs

Technical Program Committee:
Aman Jassal, Huawei
Anna Lukowa, Nokia Bell Labs
Debdeep Chatterjee, Intel
Dennis Ogbe, Purdue University
Parth Amin, Ericsson
Istvan Z. Kovacs, Nokia Bell Labs
Jie Chen, Nokia Bell Labs
Johan Bergman, Ericsson
Jun Tan, Nokia Bell Labs
Kathy Mao, Nokia Bell Labs

Kiran Venugopal, University of Texas at Austin
Krzysztof Bakowski, Nokia Bell Labs
Martin Beale, Sony
Michel Robert, Nokia Bell Labs
Mo Kim, Virginia Tech
Nitin Mangalvedhe, Nokia Bell Labs
Rapeepat Ratasuk, Nokia Bell Labs
Ryan Keating, Northwestern University
Sassan Iraji, Aalto University
Shin Horng Wong, Sony
Venkatkumar Venkatasubramanian, Nokia Bell Labs
Xingqin Lin, Ericsson
Yanji Zhang, Nokia Bell Labs
Yuantao Zhang, Nokia Bell Labs
Zexian Li, Nokia Bell Labs

Program

Sunday, 18 September 2016 8:30-10:00 Verdun
Session 1
Keynote 1:
    Vehicle-to-X Communication Using Millimeter Waves
    Robert Heath, University of Texas at Austin

Keynote 2:
    An Overview of 4G and 5G IoT Standardization in 3GPP
    Hao Xu, Qualcomm

1 **On the Achievable Coverage and Uplink Capacity of Machine-Type Communications (MTC) in LTE Release 13**
    Vidit Saxena, Anders Wallen, Tuomas Tirronen, Ericsson Research; Hazhir Shokri, Johan Bergman, Yufei Blankenship, Ericsson AB

Sunday, 18 September 2016 10:30-12:00 Verdun
Session 2
2 **A Computationally Efficient Adaptive Resource Allocation Scheme for M2M Communications**
    Yali Wu, Ningbo Zhang, Guixia Kang, Beijing University of Posts and Telecommunications, China

3 **Coverage and Capacity Analysis of LTE-M and NB-IoT in a Rural Area**
    Mads Lauridsen, Aalborg University; Istvan Z. Kovacs, Nokia Networks; Preben E. Mogensen, Aalborg University; Mads Sorensen, Steffen Holst, Telenor Danmark

4 **Performance Analysis of Low-Complexity Simply-Differential Time Synchronization Approach for MTC over LTE Systems**
    Leila Nasraoui, Leila Najjar, Mohamed Siala, SupCom, Tunisia

5 **Performance Evaluation of NB-IoT Coverage**
    Ansuman Adhikary, Xingqin Lin, Y.-P. Eric Wang, Ericsson

6 **Data Channel Design and Performance for LTE Narrowband IoT**
    Rapeepat Ratasuk, Nokia Networks; Nitin Mangalvedhe, Jorma Kaikkonen, Michel Robert, Nokia

7 **Energy States Aided Relay Selection for Cognitive Relaying Transmission**
    Minghua Xia, Sun Yat-sen University; Tang Dong, Dandan Jiang, Guangzhou University; Chengwen Xing, Beijing Institute of Technology

Sunday, 18 September 2016 13:30-15:00 Verdun
Session 3
Keynote 3
    Amin Arbabian, Stanford University

Panel
    Panelists: Jin Yang, Robert Heath, Hao Xu, Amin Arbabian

8 **Channel coding for ultra-reliable low-latency communication in 5G systems**
    Michal Sybis, Krzysztof Wesolowski, Poznan University of Technology; Keeth Jayasinghe, Nokia Bell Labs; Venkatkumar Venkatasubramanian, Nokia NET; Vladimir Vukadinovic, Nokia Bell Labs

Sunday, 18 September 2016 15:30-17:00 Verdun
Session 4
9. **D2D Neighbor Discovery and Resource Scheduling Through Demodulation Reference Signal**
    Huan Tang, University of California, Davis; Zhi Ding, UC Davis; Bernard C. Levy, University of California, Davis

10 **Research on Overlay D2D Resource Scheduling Algorithms for V2V Broadcast Service**
    Zhang Xiguang, Yong Shang, Peking University

11 **Distributed Slot Allocation in Capillary Gateways for Internet of Things Networks**
    Fatima Hussain, Alexander Ferworn, Ryerson University

12 **Edge Selection-Based Low Complexity Detection Scheme for SCMA System**
    Yudan Wang, Ling Qiu, University of Science and Technology of China

13 Efficiency Gain for RoHC Compressor Implementations with Dynamic Configuration
Mate Tomoskozi, Budapest University of Technology and Economics; Patrick Seeling, Central Michigan University; Peter Ekler, Budapest University of Technology and Economics; Frank Fitzek, TU Dresden

14 A survey on intelligent MAC layer jamming attacks and countermeasures in the context of WSNs
Taieb Hamza, Ecole de Technologie Superieure; Georges Kaddoum, University of Quebec, Ecole de Technologie Superieure; Aref Meddeb, National Engineering School of Sousse, Tunisia; Georges Matar, Ecole de Technologie Superieure

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Sunday, 18 September 2016 8:30-15:00 Lachine

W3: Vehicular Information Services for the Internet of Things (VISIT 2016)

The Internet of Things (IoT) has recently gained great attention from both academia and industry. Connecting billions of devices for communication and service provisioning shapes the main target of the IoT. Among the key enablers of IoT, smart vehicles have been promising solutions for providing on-road communication and ubiquitous information services. In-vehicle sensors, diversified communication modules, and an on-board unit with high computing and storage capabilities enable the smart vehicle to become a mobile resource provider. The real value of vehicular resources is much realized when translated into information services that put these resources into action. Expanding the smart vehicle-based services/applications beyond the intelligent transportation services requires research and development efforts to explore new service scopes, create innovative system architectures, and design enabling technologies. The VISIT workshop is intended to create a platform for researchers, developers, and practitioners from academia and industry in the areas of IoT and vehicular technologies, service provisioning, and ubiquitous computing to share and discuss their ideas, experiences, challenges, and practical implementations.

Workshop Co-Chairs
Sherin Abdelhamid, Ain Shams University, Egypt
Khalid Elgazzar, Carnegie Mellon University, USA

Technical Program Committee
Damla Turgut, University of Central Florida, USA
Robert Benkoczi, Lethbridge University, Canada

Walaa Hamouda, Concordia University, Canada
Kaoutar El Maghraoui, IBM T. J. Watson Research Center, USA
Amr El Mougy, German University in Cairo, Egypt
Ayman Radwan, Instituto de Telecomunicações-Aveiro, Portugal
Tamer Abdelkader, Ain Shams University, Egypt
Karim Emara, Technische Universität München, Germany
Mervat AbuElkheir, Mansoura University, Egypt

Program

Sunday, 18 September 2016 8:30-10:00 LaSalle
Session 1

1 Keynote
Soumaya Cherkaoui, Université de Sherbrooke, Canada

2 Link Activation with Parallel Interference Cancellation in Multi-hop VANET
Meysam Azizian, Soumaya Cherkaoui, Université de Sherbrooke, Canada; Abdelhakim Hafid, University of Montreal, Canada

3 Performance Evaluation of Multicast Video Distribution using LTE-A in Vehicular Environments
Jayashree Thota, Berna Bulut, Angela Doufexi, Simon Armour, Andrew Nix, University of Bristol, United Kingdom

Sunday, 18 September 2016 10:30-12:00 LaSalle
Session 2

1 Generic Geo-Social Mobility Model for VANET
Nardine Basta, University of Ulm; Amal ElNahas, British University in Egypt; Hans Peter Großmann, University of Ulm; Slim Abdennadher, German University in Cairo

2 Dynamic Mapping of Road Conditions using Smartphone Sensors and Machine Learning Techniques
Shahd Abdel Gawad, Amr El Mougy, Menna El Meligy, German University in Cairo

3 Integrating Vehicular Data into Smart Home IoT Systems using Eclipse Vorto
Jeroen Laverman, Bosch Software Innovations GmbH; Dennis Grewe, Robert Bosch GmbH; Olaf Weinmann, Bosch Software Innovations GmbH; Marco Wagner, Sebastian Schildt, Robert Bosch GmbH

Sunday, 18 September 2016 13:30-15:00 LaSalle
Session 3

1 Modelling of Communication Reliability for Platooning Applications for Intelligent Transport System
Gaurav Pathak, Eindhoven University of Technology; Hong Li, NXP Semiconductors; Chetan Belagal Math, Sonia Heemstra de Groot, Eindhoven University of Technology

2 Risk Assessment for Traffic Safety Applications with V2V Communications
Chetan Belagal Math, Eindhoven University of Technology; Hong Li, NXP Semiconductors; Sonia Heemstra de Groot, Eindhoven University of Technology

3 Intelligent Traffic Signal Duration Adaptation using Q-Learning with an Evolving State Space
Vinayak Gaikwad, Sanket Shirish Kadarkar, Gaurav S. Kasbekar, Indian Institute of Technology Bombay

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Sunday, 18 September 2016 13:30-17:00 Fontaine C

W4: 5G Millimeter-Wave Channel Models

Both industry and the research community urgently require accurate characterization of wireless channels in the bands above 6 GHz. While there are many groups currently working on 5G channel measurements and modeling (e.g., METIS2020, COST1004, IEEE 802.11ay, ETSI mmWave SIG, NYU Wireless), many of these efforts are focused on developing channel models for specific wireless systems and may be short-lived once initial standards are in place.

In response to this need, the U.S. National Institute of Standards and Technology (NIST) has recently begun to coordinate a 5G mmWave Channel Model Alliance of companies, academia, and government organizations that is supporting the development of more accurate, consistent, and predictive channel models.

This workshop will be a venue for all members of the 5G and cm/mmWave channel modelling communities to brainstorm and to identify emerging concepts, technologies, and analytical tools in this important area.

Program

Sunday, 18 September 2016 13:30-15:00 LaSalle
Session 1

1 **Keynote: Recent Accomplishments of the 5G mmWave Channel Model Alliance**
David G. Michelson, University of British Columbia, Canada

2 **Keynote: Some Practical Observations on mmWave Measurements**
David Steer, Huawei Technologies, Canada

3 **Indoor Channel Measurements Using a 28GHz Multi-Beam MIMO Prototype**
Akbar M. Sayeed, John Brady, Peng Cheng, Usman Tayyab, University of Wisconsin

Sunday, 18 September 2016 15:30-17:00 LaSalle
Session 2

1 **mmWave Channel Characterization at Helsinki Airport in the 15, 28, and 60 GHz Bands**
Joni Vehmas, Jan Jarvelainen, Sinh Nguyen, Reza Naderpour, Katsuyuki Haneda, Aalto University

2 **Multi-Zone Propagation in Millimeter-Wave Bands for Indoor Hotspot Deployment**
Jian Li, Shanghai Huawei Technologies Co., Ltd.; David Steer, Wen Tong, Huawei Technologies Canada Co., Ltd.; Jia He, Huawei Technologies; Ziming Yu, Huawei Technologies, Co., Ltd.

3 **Characterization of Multipath Persistence in Device-to-Device Scenarios at 30 GHz**
Badrun Naher Liya, David G Michelson, University of British Columbia, Canada

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Sunday, 18 September 2016 13:00-17:00 LaSalle
W5: First International Workshop on Vehicular Security (V-SEC 2016)

The objective of the International Workshop on Vehicular Security (V-SEC 2016) is to bring together members of the vehicular security community (industry, government, academia) at the 2016 84th IEEE Vehicular Technology Conference. At this first workshop, the latest research findings in this emerging area will be shared and new research opportunities will be identified through the exchange of ideas among the IEEE attendees.

The half day V-SEC 2016 workshop will include an in-depth instructional session on CAN Bus security, two plenary talks by internationally renowned experts in vehicle security, and a panel discussion on the future of vehicle security and privacy.

Workshop Chairs:
Alexander M. Wyglinski, Worcester Polytechnic Institute
Rich Pietravalle, The MITRE Corporation

Perry Engle, The MITRE Corporation
Joe Chapman, The MITRE Corporation

Program

Sunday, 18 September 2016 13:00-15:00 LaSalle
Session 1

1 **Instructional Session on CAN Bus Security**
Hristos Giannopoulos, The MITRE Corporation

2 **Secure Communications for the Connected Car**
John Cotner, NXP Semiconductors

Sunday, 18 September 2016 15:30-17:00 LaSalle
Session 2

1 **How-To Guide for Car Hacking**
Craig Smith, Theia Labs

2 **Panel Discussion:**
Emerging Threats to Automotive Security & Privacy
Panelists: Hristos Giannopoulos, John Cotner, Craig Smith

VTC2016-Fall Technical Program

Monday 19 September 2016

Monday, 19 September 2016 11:00-12:30 La Salle
1A: 5G I
Chair: Hai Lin, Osaka Prefecture University, Japan

1 **Carrying MTC Services in 5G - A Network Management Perspective**
Xu Li, Jaya Rao, Hang Zhang, Sophie Vrzic, Huawei Technologies Canada, Canada

2 **Downlink Transmission Scheme Based on Virtual Cell Merging in Ultra Dense Networks**
Chiyang Xiao, Jie Zeng, Xin Su, Jing Wang, Xibin Xu, Lu Ge, Li Zhang, Tsinghua University

3 **GFDM with Different Subcarrier Bandwidths**
Yuta Akai, Yuka Enjoji, Yukitoshi Sanada, Keio University; Ryota Kimura, Ryo Sawai, Sony Corporation

4 **HARQ Enriched Feedback Design for 5G Technology**
Saeed R. Khosravirad, Klaus I. Pedersen, Luke Mudolo, Krzysztof Bakowski, Nokia - Bell Labs

5 **5G Experimental Trial Achieving Over 20 Gbps Using Advanced Multi-antenna Solutions**
Kiichi Tateishi, Daisuke Kurita, Atsushi Harada, Yoshihisa Kishiyama, NTT DOCOMO, INC.; Shoji Itoh, Ericsson Japan K.K.; Hideshi Murai, Ericsson Japan; Stefan Parkvall, Johan Furuskog, Ericsson Research; Peter Nauclér, Ericsson

1B: D2D I
Chair: Cailian Chen, Shanghai Jiao Tong University, China

1 **Energy-Efficient Power Control for Device-to-Device Communications with Max-Min Fairness**
Kai Yang, Beijing Institute of Technology; Jinsong Wu, Universidad de Chile; XiaoZheng Gao, Xiangyuan Bu, Beijing Institute of Technology; Song Guo, The University of Aizu

2 **Exploiting Geographical Context in D2D Communications**
Afef Feki, Huawei Technologies Co. Ltd., France; Melissa Duarte, Huawei Technologies Co. Ltd., France; Stefan Valentin, Huawei Technologies Co. Ltd., France; Luca Rose, Huawei Technologies Co. Ltd., France

3 **Joint Resource Block Reuse and Power Control for Multi-Sharing Device-to-Device Communication**
Kuo-Yi Chen, National Tsing Hua University, Taiwan; Jung-Chun Kao, National Tsing Hua University, Taiwan; Si-An Ciou, National Tsing Hua University, Taiwan; Shih-Han Lin, National Tsing Hua University, Taiwan

4 **Auction based Energy-Efficient Resource Allocation and Power Control for Device-to-Device underlay communication**
Wei Wei, Qiang Wang, Lina Yang, Xin Hu, Beijing University of Posts and Telecommunications, China

5 **Bio-Inspired Resource Allocation for Relay-Aided Device-to-Device Communications**
Christoforos Vlachos, Kings College London, United Kingdom; Hisham Elshaer, Vodafone Group R&D, United Kingdom; Jian Chen, Northeastern University, China; Vasilis Friderikos, Mischa Dohler, Kings College London, United Kingdom

1C: TV White Space
Chair: Feifei Gao, Tsinghua University, China

1 **A Hybrid Power Line and TV White Space MIMO System for Indoor Broadband Communications**
Mohammad Heggo, Xu Zhu, University of Liverpool, United Kingdom; Sun Sumei, Institute for Infocomm Research Agency for Science, Engineering and Research, Singapore; Yi Huang, University of Liverpool, United Kingdom

2 **Demonstration of RF Digitising Concurrent Dual-Band Receiver for Carrier Aggregation over TV White Spaces**
Ravinder Singh, Qiang Bai, Timothy O'Farrell, Kenneth Lee Ford, Richard Langley, The University of Sheffield, United Kingdom

3 **Experimental Verification of Spectrum Superposing in Two Different Systems by Blind Adaptive Array with Subcarrier Transmission Power Assignment**
Hideya So, Kazuki Maruta, Jun Mashino, Kouhei Suzaki, Nippon Telegraph and Telephone Corporation, Japan

4 **Implementation of Compressive Sensing with Real-Time Signals over TV White Space Spectrum in Cognitive Radio**
Yue Gao, Zhijin Qin, Queen Mary University of London, United Kingdom

5 **TV White Space Network Provisioning with Directional and Omni-directional Terminal Antennas**
Qianyun Zhang, Xingjian Zhang, Yue Gao, Queen Mary University of London, United Kingdom; Oliver Holland, Mischa Dohler, Kings College London, United Kingdom; Jean-Marc Chareau, Pravir Chawdhry, Joint Research Centre of the European Commission, Italy

1D: Multiuser Detection
Chair: Alex Stephenne, Ericsson

1 **Bayesian Inference Algorithms for Multiuser Detection in M2M Communications**
Xiaoxu Zhang, University of Electronic Science and Technology of China, China; Ying-Chang Liang, University of Electronic Science and Technology of China, China; Jun Fang, University of Electronic Science and Technology of China, China

2 **Virtual Pilot-based Channel Estimation and Multiuser Detection for Multiuser MIMO in LTE-Advanced**
Sunho Park, Seoul National University, South Korea; Jun Won Choi, Hanyang University, South Korea; Ji-Yun Seol, Samsung Electronics Co., Ltd., South Korea; Byonghyo Shim, Seoul National University, South Korea

3 **On the Performance of MC-CDMA Cellular Systems Employing Multiuser Decorrelating Detector and Antenna Array**
Henry Ramiro Carvajal Mora, Nathaly Veronica Orozco Garzon and Celso de Almeida, State University of Campinas (UNICAMP), Brazil

4 **Successive Interference Canceller with CSI Weighting Combining scheme**
Hajime Katsuda, Seiji Ohmori, Kazunori Akabane, Nippon Telegraph and Telephone Corporation, Japan

5 **A Novel Multiuser Detection Algorithm in Uplink UFMC-IDMA Systems with Carrier Frequency Offsets**
Chongbin Wu, Ming Lei, Minjian Zhao and Ming-min Zhao, Zhejiang University, China

1E: Vehicular Communications
Chair: Yumeng Gao, Nanyang Technological University, Singapore

1 **Fading Statistics of Voice Channel for The European Union Emergency Call**
Yunrui Li, Wayne State University, United States; John Liu, Wayne State University, United States

2 **Measurement-based Analysis of Relaying Performance for Vehicle-to-Vehicle Communications with Large Vehicle Obstructions**
Ruisi He, Beijing Jiaotong University, China; Andreas Molisch, University of Southern California, United States; Fredrik Tufvesson, Lund University, Sweden; Rui Wang, University of Southern California, United States; Tingting Zhang, Harbin Institute of Technology, China; Zheda Li, University of Southern California, United States; Zhangdui Zhong, Beijing Jiaotong University, China; Bo Ai, Beijing Jiaotong University, China

3 **Network Coding based BSM Broadcasting at Road Intersection in V2V Communication**
Yumeng Gao, G. G. Md. Nawaz Ali, Nanyang Technological University, Singapore; Peter Han Joo Chong, Auckland University of Technology, New Zealand; Yong Liang Guan, Nanyang Technological University, Singapore

4 **Time Synchronization for Multi-Link D2D/V2X Communication**
Konstantinos Manolakis, Wen Xu, Huawei Technologies, Germany

5 **A Primer on Vehicle-to-Barrier (V2B) Communications: Effects of Roadside Barriers, Encroachment, and Vehicle Braking**
Samil Temel, Turkish Air Force NCO College, Turkey; Mehmet Vuran, Ronald Faller, University of Nebraska-Lincoln, United States

1F: OFDM
Chair: Hai Lin, Osaka Prefecture University, Japan

1 **CP-OFDM and UF-OFDM in the Presence of Phase Noises and Their Mitigations**
Xiaoming Chen, Andreas Wolfgang, Qamcom Research & Technology AB, Sweden; Ali Zaidi, Ericsson Research, Sweden

2 **Theoretical Shannon Capacity Performance of Nonlinearly Amplified Uplink OFDMA Signals in the Presence of Terminal Mobility**
Takahiro Yamaguchi, Waseda University, Japan; Kei Nishimura, Waseda University, Japan; Fumiaki Maehara, Waseda University, Japan

3 **Wavelet-Coded OFDM for Next Generation Mobile Communications**
Lucas Cavalcante, DTU, Denmark; Rui Dinis, Universidade Nova de Lisboa, Portugal; Luiz G. de Q. Silveira Junior, Luiz F. de Q. Silveira, Universidade Federal do Rio Grande do Norte, Brazil; J. J. Vegas Olmos, Idelfonso T. Monroy, DTU, Denmark

4 **Time-Interleaved Block-Windowed Burst OFDM**
Telmo Fernandes, Marco Gomes, Vitor Silva, Rui Dinis, Instituto de Telecomunicações, FCT-UNL, Portugal

5 **Towards PHY-aided Authentication via Weighted Fractional Fourier Transform**
Xiaojie Fang, Xuejun Sha, Harbin Institute of Technology, China; Ning Zhang, University of Waterloo, Canada; Xuanli Wu, Harbin Institute of Technology, China; Xuemin (Sherman) Shen, University of Waterloo, Canada

1G: Resource Allocation I
Chair: Rung-Hung Gau, National Chiao Tung University, Taiwan

1 **Redundancy Adaptation for Multi-Path Intra-Flow Network Coding in Wireless Mesh Networks**
Paul-Louis Ageneau, Telecom ParisTech, France; Chuchu Wu, UCLA, United States; Nadia Boukhatem, Telecom ParisTech, France; Mario Gerla, UCLA, United States

2 **Power Allocation using Geometric Water Filling for OFDM-based Cognitive Radio Networks**
Ajmery Sultana, Lian Zhao, Xavier Fernando, Ryerson University, Canada

3 **A New Performance Evaluation Metric for Radio Resource Management in Wireless Local Area Networks**
Hassan Halabian, Mike Skof, Afshin Sahabi, Ericsson Canada, Canada

4 **Proactive Location-Based Scheduling of Delay-Constrained Traffic Over Fading Channels**
Antonious M. Girgis, Amr El-Keyi, Mohammed Nafie, Nile University, Egypt; Ramy Gohary, Carleton University, Canada

5 **Distributed Load Balancing User Association and Self-Organizing Resource Allocation in HetNets**
Atefeh Hajijamali Arani, Isfahan University of Technology, Iran; Abolfazl Mehbodniya, Tohoku University, Japan; Mohammad Javad Omidi, Isfahan University of Technology, Iran; Fumiyuki Adachi, Tohoku University, Japan

1H: MIMO I
Chair: Walaa Hamouda, Concordia University, Canada

1 **A Low-Complexity MIMO Detector Based on Fast Dual-lattice Reduction Algorithm**
Changle Jing, Xin Wang, Bin Chen, Yue Ma, Jibo Wei, National University of Defence Technology, China

2 **Energy-Efficient Power Allocation for Cognitive MIMO Channels**
Lokman Sboui, KAUST, Saudi Arabia; Zouheir Rezki, KAUST, Saudi Arabia; Mohamed-Slim Alouini, KAUST, Saudi Arabia

3 **Coverage Performance of MIMO-MRC in Heterogeneous Networks: A Stochastic Geometry Perspective**
Mohammad Ghadir Khoshkholgh, The University of British Columbia, Canada; Keivan Navaie, Lancaster University, United Kingdom; Kang G. Shin, The University of Michigan, United States; Victor C. M. Leung, The University of British Columbia, Canada

4 **Large-Scale MIMO Systems with Practical Power Constraints**
Rami Hamdi, École de Technologie Supérieure, Canada; Elmahdi Driouch, Wessam Ajib, Universite du Quebec a Montreal, Canada

5 **On Normalization of Matched Filter Belief in GaBP for Large MIMO Detection**
Takumi Takahashi, Osaka University, Japan; Shinsuke Ibi, Osaka University, Japan; Seiichi Sampei, Osaka University, Japan

1P: Signal Transmission and Reception Posters I
Chair: Chin-Liang Wang, National Tsing Hua University, Taiwan

1 **Linear Physical-layer Network Coding for the fading Y-channel without Transmitter Channel StateInformation**
Jiajia Guo, UNSW, Australia; Tao Yang, UTS, Australia; Jinhong Yuan, UNSW, Australia; Jian Zhang, Data61, Australia

2 **Variable-Rate Anytime Transmission with Feedback**
Leefke Grosjean, Ragnar Thobaben, Lars K. Rasmussen, Mikael Skoglund, KTH Royal Institute of Technology, Sweden

3 **A Different Approach in Transceiver Design for Full-Duplex MIMO Systems**
Ali Cagatay Cirik, University of British Columbia, Canada; Omid Taghizadeh, RWTH Aachen University, Germany; Lutz Lampe, University of British Columbia, Canada; Tharmalingam Ratnarajah, University of Edinburgh, United Kingdom

4 **Multi-stage Message Passing Algorithm for SCMA downlinkReceiver**
Han Zhang, Shuai Han, Wei-Xiao Meng, Harbin Institute of Technology, China

5 **Improved decoder likelihoods for 3G cellular uplinkover asynchronous multi-path fading channels**
Shady Elbassiouny, AUC, Egypt; Ayman Elezabi, AUC, Egypt

6 **Capacity Analysis of PLC over Rayleigh Fading Channels with Colored Nakagami-m Additive Noise**
Yun Ai, Michael Cheffena, Norwegian University of Science and Technology, Norway

2A: Small Cells
Chair: Vuong Mai, The University of Aizu, Japan

1 **Small Cells Deployment for Cost Reduction of Hybrid-Energy Cellular Networks**
Hussein Al Haj Hassan, Loutfi Nuaymi, Alexander Pelov, Telecom Bretagne, France

2 **Initial Cell Search Method Based on Two-Step Frequency Offset Estimation for Small Cells in Heterogeneous Networks**
Naoki Noguchi, Mamoru Sawahashi, Tokyo City University, Japan; Satoshi Nagata, Yoshihisa Kishiyama, NTT DOCOMO, Japan

3 Bi-SON: Big-Data Self Organizing Network for Energy Efficient Ultra-Dense Small Cells
Li-Chun Wang, Shao-Hung Cheng, National Chiao Tung University, Taiwan; Ang-Hsun Tsai, Chung Cheng Institute of Technology, National Defense University, Taiwan

4 Effects of Hyper-Dense Small-Cell Network Deployments on a Realistic Urban Environment
Dennis M. Rose, Thomas Kürner, Technische Universität Braunschweig, Germany

5 Partial Critical Path Based Greedy Offloading in Small Cell Cloud
Pengtao Zhao, Hui Tian, Bo Fan, Beijing University of Posts and Telecommunications, China

Monday, 19 September 2016 14:00-15:30 Loungueuil
2B: Cognitive Radio Networks
Chair: Yue Gao, Queen Mary University of London, UK

1 A Sparsity-Aware Approach for NBI Estimation and Mitigation in Large Cognitive Radio Networks
Ala Gouissem, Ridha Hamila, Sebti Foufou, Qatar University, Qatar; Naofal Al-Dhahir, UT Dallas, United States

2 Transmission Protocol Design in Cognitive Cellular Heterogeneous Networks
Yinglei Teng, Ying Wang, Ya'nan Xiao, Mei Song, Beijing University of Posts and Telecommunications, China

3 On the Achievable Rate and Average Sum Capacity of Spread Spectrum Underlay CR Networks
Saed Daoud, David Haccoun, Christian Cardinal, École Polytechnique de Montréal, Canada

4 Fundamental Capacity Limits of Spectrum-Sharing in Hoyt (Nakagami-q) Fading Channels
Juan Romero-Jerez, F. Javier Lopez-Martinez, Universidad de Malaga, Spain

5 Proactive Cognitive Networks with Predictable Demand
Rana Ahmed, Nile University, Giza, Egypt; John Tadrous, Rice University, Texas, United States; Amr El-Keyi, Carleton University, Canada; Mohamed Nafie, Nile University, Giza and Cairo University, Giza, Egypt

Monday, 19 September 2016 14:00-15:30 Fontaine C
2C: RF Systems and Design
Chair: Christina Larsson, Ericsson AB

1 Design of A wideband and dual-polarized CPW-Fed Monopole Antenna for Future 5G Communications
Haiyang Zhang, Huan Sun, Tao YANG, Nokia Shanghai Bell Co. Ltd., China; Yann Mahe, Tchanguiz Razban, LUNAM Université, Université de Nantes, France

2 Radiation Pattern Analysis of Single and Multi-Antenna Wearable Systems
Mohammad Abdullah, Xenofon Fafoutis, Maciej Klemm, Geoffrey Hilton, University of Bristol, United Kingdom

3 Single Radio Transmission and Reception for Spatial Multiplexing MIMO
Gweondo Jo, Jung-Nam Lee, Hyoung-Oh Bae, Young-Ho Lee, Donghyuk Gwak, Jung-Hoon Oh, ETRI, South Korea

4 Integrating 3D Channel Model and Grid of Beams for 5G mMIMO System Level Simulations
Rakash SivaSiva Ganesan, Wolfgang Zirwas, Berthold Panzner, Nokia Bell Labs, Germany; Klaus I. Pedersen, Nokia Bell Labs, Denmark; Kimmo Valkealahti, Nokia Bell Labs, Finland

5 Transmit Antenna Selection for Multi-User Underlay Cognitive Transmission With Zero-Forcing Beamforming
Muhammad Hanif, Hong-Chuan Yang, University of Victoria, Canada; Mohamed-Slim Alouini, King Abdullah University of Science and Technology, Saudi Arabia

Monday, 19 September 2016 14:00-15:30 Fontaine D
2D: Vehicular Networks - MAC
Chair: Mingming Cai, University of Notre Dame, USA

1 A Data Traffic Steering Algorithm for IEEE 802.11p/LTE Hybrid Vehicular Networks
Nils Dreyer, Andreas Möller, Technische Universität Braunschweig, Germany; Zeeshan Hameed Mir, Fethi Filali, Qatar Mobility Innovations Center, Qatar; Thomas Kürner, Technische Universität Braunschweig, Germany

2 An Infrastructure-Free Slot Assignment Algorithm for Reliable Broadcast of Periodic Messages in Vehicular Ad hoc Networks
Mohamed Hadded, Anis Laouiti, Telecom SudParis, France; Paul Muhlethaler, INRIA, France; Leila Azouz Saidane, ENSI, Tunisia

3 Multichannel Immediate Multiple Access for Dedicated Short-Range Communications: IEEE 802.11p-Compatible Physical Layer
Mingming Cai, J. Nicholas Laneman, University of Notre Dame, United States

4 LRRA: Location-related Rate Adaptation Algorithm in IEEE 802.11p for DSRC Technology in VANET
Jian Xiong, Cailian Chen, Xinping Guan, Cunqing Hua, Shanghai Jiao Tong University, China

5 A Link Reliability Model of Metropolitan VANETs for Data Dissemination
Tong Zhao, Yuan Yuan, Yichun Duan, Wei Yan, Peking University, China; Ching-Yao Chan, University of California, United States

Monday, 19 September 2016 14:00-15:30 Fontaine E
2E: Radio Access
Chair: Xianbin Wang, Western University, Canada

1 An Optimized Design of Irregular SCMA Codebook Based on Rotated Angles and EXIT Chart
Lisu Yu, Pingzhi Fan, Zheng Ma, Xianfu Lei, Southwest Jiaotong University, China; Dageng Chen, Communications Technology Lab Huawei Technologies Co., Ltd, China

2 Distribution Reshaping for Massive Access Control in Cellular Networks
Hua Chao, Yu Chen, Nokia Shanghai Bell Co. Ltd., China; Jinsong Wu, Universidad de Chile, Santiago, Chile; Haiyang Zhang, Nokia Shanghai Bell Co. Ltd., China

3 An efficient Radio Resource Re-Allocation Scheme for Delay Guaranteed Vehicle-to-Vehicle Network
Shao-Chou Hung, National Taiwan University, Taiwan; Xin Zhang, Andreas Festag, Technische Universität Dresden, Germany; Kwang-Cheng Chen, National Taiwan University, Taiwan; Gerhard Fettweis, Technische Universität Dresden, Germany

4 SCMA: A Promising Technology for 5G Radio Access Networks
Yan Chen, Alireza Bayesteh, Yiqun Wu, Mahmoud Taherzadeh, Dageng Chen, Jianglei Ma, Huawei Technologies Co., Ltd., Canada; Shuai Han, Harbin Institute of Technology, China

5 Joint Codebook Design and Assignment for Detection Complexity Minimization in Uplink SCMA Networks
Daosen Zhai, Min Sheng, Xijun Wang, Jiandong Li, Institute of Information Science, Xidian University, China

Monday, 19 September 2016 14:00-15:30 Fontaine F
2F: Optical and Visible Light Communication
Chair: Yan Chen, Huawei Technologies Co., Ltd.

1 Spectral Efficient Cooperative Downlink Transmission Schemes for DCO-OFDM-Based Optical Attocell Networks
Hossein Kazemi, Majid Safari, Harald Haas, The University of Edinburgh, United Kingdom

2 Generalized Spatial Pulse Position Modulation for Optical Wireless Communications
Hammed Olanrewaju, John Thompson, Wasiu Popoola, The University of Edinburgh, United Kingdom

3 Outage Analysis of Asymmetric RF-FSO Systems
Imran Ansari, Mohamed Abdallah, Texas A&M University at Qatar (TAMUQ), Qatar; Mohamed-Slim Alouini, King Abdullah University of ScienceTechnology (KAUST), Saudi Arabia; Khalid Qaraqe, Texas A&M University at Qatar (TAMUQ), Qatar

4 Physical Layer Implementation of Standard Compliant Vehicular VLC
Bugra Turan, Koc University, Turkey; Omer Narmanlioglu, Ozyegin University, Turkey; Sinem Coleri Ergen, Koc University, Turkey; Murat Uysal, Ozyegin University, Turkey

5 Reshaped OFDM Transmission Scheme for Visible Light Communication using RGBA-LED
Lei Kong, Wei Xu, Hua Zhang, Chunming Zhao, Southeast University, China

Monday, 19 September 2016 14:00-15:30 Fontaine G
2G: Massive MIMO I
Chair: Geoffrey Messier, University of Calgary, Canada

1 A New Design and Multiport Performance Evaluation for 3D Massive MIMO System
Yingni Jin, Nokia Shanghai Bell Co. Ltd., China; Nan Li, Nokia Shanghai Bell Co. Ltd., China; Chongxian Zhong, Nokia Shanghai Bell Co. Ltd., China; Xun Li, Nokia Shanghai Bell Co. Ltd., China; Haiyang Zhang, Nokia Shanghai Bell Co. Ltd., China

2 Massive MIMO Performance with Pilot Reuse
Fredrik Athley, Ericsson AB, Sweden; Sebastian Faxér, Ericsson AB, Sweden

3 On the Capacity of Nonlinear Massive MIMO-OFDM Systems
Pedro Fernandes, Joao Guerreiro, Rui Dinis, Paulo Montezuma, FCT-UNL, Portugal

4 Complexity Reduction for Direction of Arrival Estimation with Massive MIMO
Martin Kurras, Lars Thiele, Thomas Haustein, Fraunhofer Heinrich Hertz Institute, Germany; Xiao Peng, NEC Corporation, Japan; Masayuki Ariyoshi, NEC Corporation, Japan

5 Performance Evaluation of Massive MIMO with Low-Height Small-Cell Using Realistic Channel Models
Boonsarn Pitakdumrongkija, Masayuki Ariyoshi, NEC Corporation, Japan; Leszek Raschkowski, Stephan Jaeckel, Lars Thiele, Fraunhofer Heinrich Hertz Institute, Germany

Monday, 19 September 2016 14:00-15:30 Fontaine A and B
2P: Signal Transmission and Reception Posters II
Chair: Feifei Gao, Tsinghua University, China

1 PLC Performance Evaluation with Non-Uniform Background Noise Phase
Aashish Mathur, Manav R. Bhatnagar, Bijaya K. Panigrahi, Indian Institute Of Technology Delhi, India

2 Switch Control Based Single-RF Transmitter for Multiplexing gain
Daehee Park, KAIST, South Korea; Dong-Ho Cho, KAIST, South Korea

3 Quantization and Entropy Coding Scheme for Dictionary Learning Based Image Compression
Juan Wang, Xiaoming Tao, Xijia Liu, Ning Ge, Jianhua Lu, Tsinghua University, China

4 Area-Efficient Fault-Tolerant Design for Low-Density Parity-Check Decoders
Bohua Li, Tsinghua National Laboratory for Information ScienceTechnology, China; Yukui Pei, Tsinghua Space Center, China; Ning Ge, Tsinghua National Laboratory for Information Science and Technology, China

5 Performance study of IEEE 802.15.4/4G waveforms over the mobile underground mine radio-channel
Mohamed Said Mezghanni, Nahi Kandil, Nadir Hakem, Université du Québec en Abitibi-Témiscamingue (UQAT), Canada

6 Higher-Order Circularity based I/Q ImbalanceCompensation in Direct-Conversion Receivers
Fanglin Gu, Shan Wang, Jibo Wei, National University of Defense Technology, China; Wenwu Wang, University of Surrey, United Kingdom

7 User Matching with Relation to the Stable Marriage Problem in Cognitive Radio Networks
Doha Hamza, KAUST, Saudi Arabia; Sonia Aissa, INRS, University of Quebec, Canada

Monday, 19 September 2016 16:00-17:30 La Salle
3A: Cooperative Communication I
Chair: Huan X. Nguyen, Middlesex University, UK

1 A Hybrid TDMA-MAC Cooperative Relaying Scheme: Stability and Delay Analysis
Mohamed Salman, University of Colorado, United States; Amr El-Keyi, Carleton University, Canada; Mohammed Nafie, Nile University, Egypt; Mazen Hasna, Qatar University, Qatar

2 Buffer-Aided Max-Link Relay Selection in Multi-Hop DF Cooperative Networks
Manoj B. R., Ranjan K. Mallik, Manav R. Bhatnagar, Indian Institute of Technology - Delhi, India

3 On the Design of Robust Multi-User Receivers for Base Station Cooperation Systems
Filipe Casal Ribeiro, ISCTE-IUL, Portugal; João Guerreiro, FCT-UNL, Portugal; Rui Dinis, FCT-UNL, Portugal; Francisco Cercas, ISCTE-IUL, Portugal; Adão Silva, UA, Portugal

4 Adaptive Symbol Request Sharing Scheme for Mobile Cooperative Receivers in OFDM Systems
Yasser Samayoa, Jörn Ostermann, Gottfried Wilhelm Leibniz Universität Hannover, Germany

5 Simplified Performance Analysis for Amplify-and-Forward Cooperative Diversity Optimal Detection of Binary Signals with Symmetric Alpha-Stable Noise
Tarik Saleh, Mohamed Feteiha, Mohamed Ahmed, Memorial University, Canada

Monday, 19 September 2016 16:00-17:30 Loungueuil
3B: Energy Harvesting and Efficiency
Chair: Vojislav B. Mišić, Ryerson University, Canada

1 Measurement and Analysis of Available Ambient Radio Frequency Energy for Wireless Energy Harvesting
Jonathan Kwan, University of Calgary, Canada; Abraham Fapojuwo, University of Calgary, Canada

2 Optimal Energy-Efficient Resource Allocation in Energy Harvesting Cognitive Radio Networks with Spectrum Sensing
Ramnaresh Yadav, Indira Gandhi Delhi Technical University, India; Keshav Singh, University of Edinburgh, United Kingdom; Ankit Gupta, Aricent Technologies Limited (Holdings), India; Ashwani Kumar, Indira Gandhi Delhi Technical University, India

3 Dynamic Power Allocation for a Hybrid Energy Harvesting Transmitter with Multiuser in Fading Channels
Didi Liu, Xidian University, China; Jiming Lin, Junyi Wang, Xiaohui Chen, Yibin Chen, Guilin University of Electronic Technology, China

4 Optimal Base Station Sleeping Control in Energy Harvesting Heterogeneous Cellular Networks
Yanzi Song, University of Science and Technology of China (USTC), China; Haichao Wei, University of Science and Technology of China (USTC), China; Ming Zhao, University of Science and Technology of China (USTC), China; Wuyang Zhou, University of Science and Technology of China (USTC), China; Peng Dong, Research Institute of China Mobile, China; Lijun Zhao, Research Institute of China Mobile, China

5 Power Allocation for Cognitive Energy Harvesting and Smart Power Grid Coexisting System
Peter He, Ryerson University, Canada; Lian Zhao, Ryerson University, Canada; Bala Venkatesh, Ryerson University, Canada

Monday, 19 September 2016 16:00-17:30 Fontaine C
3C: Blind Sensing
Chair: Xianbin Wang, Western University, Canada

1 Automatic Blind Modulation Recognition of Analog and Digital Signals in Cognitive Radios
Francesco Benedetto, University of Roma Tre, Italy; Antonio Tedeschi, University of Roma Tre, Italy; Gaetano Giunta, University of Roma Tre, Italy

2 Low Complexity Automatic Modulation Classification Based on Order Statistics
Lubing Han, Haozhou Xue, Feifei Gao, Tsinghua University, China; Zan Li, Xidian University, China

3 Weighted Blind Spectrum Sensing Based on Signal Auto-Correlation and Cross-Correlation Characteristics in Rayleigh Fading Channels
Xinyu Wang, Min Jia, Qing Guo, Xuemai Gu, Wanmai Yuan, Harbin Institute of Technology, China

4 EVM based Primary User Monitoring in Cognitive Radio Systems
Narayan Nepal, Philippa A. Martin, Desmond P. Taylor, University of Canterbury, New Zealand

5 Noise Estimation for Spectrum Sensing Schemes
Mahdi Al-Badrawi, Nicholas Kirsch, University of New Hampshire, United States; Bessam Al-Jewad, Cihan University, Iraq

Monday, 19 September 2016 16:00-17:30 Fontaine D
3D: Green Wireless Networking I
Chair: Yuan Wu, Zhejiang University of Technology, China

1 Game Theory-Based Energy Efficiency Optimization for Multi-User Cognitive Radio Over MIMO Interference Channels
Shujun Han, Yanhui Lu, Shouyi Yang, Xiaomin Mu, Ning Wang, Zhengzhou University, China

2 Energy-aware Design for MIMO-OFDM Network with Realistic Interference Model
Jun Chen, Zezhou Luo, Hongcheng Zhuang, Huawei Technologies Co. Ltd., China; Miaona Huang, Dongguan University of Technology, China

3 Efficient and Fair Hybrid TDMA-CSMA for Virtualized Green Wireless Networks
Atoosa Dalili Shoaei, McGill University, Canada; Mahsa Derakhshani, Loughborough University, United Kingdom; Saeedeh Parsaeefard, Iran Telecommunication Research Center, Iran, Islamic Republic of; Tho Le-Ngoc, McGill University, Canada

4 Aggregated V2I Communications for Improved Energy Efficiency using Non-Orthogonal Multiplexed Modulation
Yanan Liu, Xianbin Wang, Xiaoyu Duan, Western University, Canada; Hai Lin, Osaka Prefecture University, Japan

5 Energy Efficiency in Relay-Assisted mmWave Cellular Networks
Esma Turgut, M. Cenk Gursoy, Syracuse University, United States

Monday, 19 September 2016 16:00-17:30 Fontaine E
3E: Vehicular Networks - Network Layer
Chair: Meng Kuai, University of Alabama, USA

1 Density-Aware Delay-Tolerant Interest Forwarding in Vehicular Named Data Networking
Meng Kuai, Xiaoyan Hong, The University of Alabama, United States; Qiangyuan Yu, Jilin University, China

2 Enhanced Intersection-based Perimeter Geo-routing in Urban Vehicular Ad-hoc Networks
Mehdi Tavakoli Garrosi, Leibniz Universität Hannover, Germany

3 On Trajectory-based Network Construction for Time-Constrained Data Delivery in VANETs
Jun Qin, Shanghai Jiao Tong University, China; Yanmin Zhu, Shanghai Jiao Tong University, China; Guangtao Xue, Shanghai Jiao Tong University, China; Shiyou Qian, Shanghai Jiao Tong University, China; Minglu Li, Shanghai Jiao Tong University, China

4 Reliable Forwarding Strategy in Vehicular Networks Using NDN
Zhihua Lin, Fujian Jiangxia University, China; Meng Kuai, Xiaoyan Hong, The University of Alabama, United States

5 On the Performance of MIMO OFDM-Based Intra-Vehicular VLC Networks
Bugra Turan, Koc University, Turkey; Omer Narmanlioglu, Ozyegin University, Turkey; Sinem Coleri Ergen, Koc University, Turkey; Murat Uysal, Ozyegin University, Turkey

Monday, 19 September 2016 16:00-17:30 Fontaine F
3F: Heterogeneous Networks I
Chair: Yue Gao, Queen Mary University of London, UK

1 Cluster-based Joint Cell Association and Interference Coordination Control in Heterogeneous Networks
Liang Chen, Lin Ma, Yubin Xu, Harbin Institute of Technology, China; Victor Leung, The University of British Columbia, Canada; Xiaolu Wang, Harbin Institute of Technology, China

2 Impact of Dynamic Planning on Uplink Service Quality in Heterogeneous Cellular Networks
Mohamed Kashef, Muhammad Ismail, Texas A&M University at Qatar, Qatar; Erchin Serpedin, Texas A&M University, United States; Khalid Qaraqe, Texas A&M University at Qatar, Qatar

3 Energy Efficient Resource Allocation in 5G Hybrid Heterogeneous Networks: A Game Theoretic Approach
Hamnah Munir, Syed Ali Hassan, National University of Sciences & Technology (NUST), Pakistan; Haris Pervaiz, Qiang Ni, Leila Musavian, Lancaster University, United Kingdom

4 Joint Queue-Aware and Channel-Aware for A Novel Operation of Hybrid FSO/RF Systems
Vuong Mai, Anh Pham, The University of Aizu, Japan

5 On the Design of Irregular HetNets with Flow-Level Traffic Dynamics
Arman Shojaeifard, Khairi Hamdi, Emad Alsusa, Daniel So, University of Manchester, United Kingdom; Kai-Kit Wong, University College London, United Kingdom

3G: Modulation
Chair: Xuanli Wu, Harbin Institute of Technology, China

1 A Blind Polyphase Time-Domain Selected Mapping for Filtered Single-Carrier Signal Transmission
Amnart Boonkajay, Fumiyuki Adachi, Tohoku University, Japan

2 A Singularity-free GFDM Modulation schemewith Parametric Shaping Filter Sampling
Atsushi Yoshizawa, Ryota Kimura, Ryo Sawai, Sony Corporation, Japan

3 Adaptive Modulation and Coding for Large Open Office Indoor Wireless Environments
Indrakshi Dey, Geoffrey Messier, University of Calgary, Canada; Sebastian Magierowski, York University, Canada

4 A List Orthogonal Matching Pursuit Detector for Generalized Space Shift Keying MIMO Systems
Kuan-Hua Chen, Chiao-En Chen, Yuan-Hao Huang, National Tsing Hua University, Taiwan

5 LDPC Coded Angular Modulation Scheme for Cooperative Wireless Networks
Dushantha Nalin Kumara Jayakody, National Research Tomsk Polytechnic University, Russian Federation

Monday, 19 September 2016 16:00-17:30 Fontaine H
3H: Full-Duplex Communication
Chair: Robert Heath, The University of Texas at Austin, USA

1 Joint Transceiver Design for Full-Duplex K-Pair MIMO Interference Channel with Energy Harvesting
Yunlong Cai, Ming-Min Zhao, Zhejiang University, China; Qingjiang Shi, Zhejiang Sci-Tech University, China; Mingyi Hong, Iowa State University, United States; Benoit Champagne, McGill University, Canada

2 Self-Interference Mitigation using Active Signal Injection for Full-Duplex MIMO-OFDM Systems
Ahmed Masmoudi, Tho Le-Ngoc, McGill University, Canada

3 An Efficient User Selection Technique for Full-Duplex MU-MISO Systems
Minki Ahn, Korea University, South Korea; Han-Bae Kong, Nanyang Technological University, Singapore; Hun Min Shin, Korea University,

South Korea; Hoon Lee, Korea University, South Korea; Inkyu Lee, Korea University, South Korea

4 Cooperative versus Full-Duplex Communication in Cellular Networks: A Comparison of the Total Degrees of Freedom
Amr El-Keyi, Halim Yanikomeroglu, Carleton University, Canada

5 Use of the Recursive Least Squares Filter for Online Self Interference Channel Estimation
Mark Adams, Vijay Bhargava, UBC, Canada

Monday, 19 September 2016 16:00-17:30 Fontaine A and B
3P: Signal Transmission and Reception
Posters III
Chair: Shuai Han, Harbin Institute of Technology, China

1 Hybrid Digital-Analog Communication of a Bivariate Gaussian Source Over a Fading MAC
Chathura Illangakoon, Pradeepa Yahampath, University of Manitoba, Canada

2 On the Ratio of Exponential and Generalized Gamma Random Variables with Applications to Ad Hoc SISO Networks
Muhammad Ahsen, Syed Ali Hassan, National University of Sciences and Technology (NUST), Pakistan

3 The Benefits of Large-Scale Attenuation Over the Antenna Array in Massive MIMO Systems
Liu Liu, Beijing Jiaotong University, China; David W. Matolak, University of South Carolina, United States; Cheng Tao, Yongzhi Li, Houjin Chen, Beijing Jiatong University, China

4 Fast Algorithm for Solving Cave-filling Problems
Kalpana Naidu, VNR Vignana Jyothi Institute of Engg. & Technology, India; Mohammed zafar Ali Khan, Indian Institute of Technology Hyderabad (IIT-H), India

5 Propagation Characteristics of Suburban Environments using Hybrid Ray-Tracing Simulation
Kyung-Gyu Lee, Seong-Jun Oh, Korea University, South Korea; Jung-Soo Woo, Kyung-Tak Lee, Samsung Electronics, South Korea

Tuesday 20 September 2016

Tuesday, 20 September 2016 11:00-12:30 La Salle
4A: Millimeter Wave Communication
Chair: Stefan Schwarz, TU Wien, Austria

1 Combining NOMA and mmWave Technology for Cellular Communication
Syed Ahsan Raza Naqvi, Syed Ali Hassan, National University of Sciences and Technology, Pakistan

2 Analysis of Urban Millimeter Wave Microcellular Networks
Yuyang Wang, Kiran Venugopal, Robert Heath, The University of Texas at Austin, United States; Andreas Molisch, University of Southern California, United States

3 System Capacity of 72 GHz mmWave Transmission in Hybrid Networks
Zhenyu Shi, Yi Wang, Lei Huang, Jianglei Ma, Huawei Technologies Co., Ltd,, China

4 Channel Characteristics Analysis of Angle and Clustering in Indoor Office Environment at 28 GHz
Xiaoxing Gao, Lei Tian, Pan Tang, Tao Jiang, Baoling Liu, Jianhua Zhang, Beijing University of Posts and Telecommunications, China

5 Low-Complexity Transceiver Design for Multi-User Millimeter Wave Communication Systems under Imperfect CSI
Deepa Jagyasi, P. Ubaidulla, International Institute of Information Technology, Hyderabad, India

Tuesday, 20 September 2016 11:00-12:30 Loungueuil
4B: LTE I
Chair: Vuong Mai, The University of Aizu, Japan

1 Client-Based Control Channel Analysis for Connectivity Estimation in LTE Networks
Robert Falkenberg, TU Dortmund University, Germany; Christoph Ide, TU Dortmund University, Germany; Christian Wietfeld, TU Dortmund University, Germany

2 Design and Evaluation of LTE/WLAN Traffic Steering and Link Aggregation Algorithms
Panagiotis Fotiadis, Huawei, Sweden; Pablo Soldati, Huawei, Sweden; Peter Legg, Blu Wireless, United Kingdom

3 Design and implementation of an LTE system with multi-thread parallel processing on OpenAirInterface platform
Hengyang Shen, Xingguang Wei, Haitao Liu, Beijing University of Posts and Telecommunications, China; Yang Liu, Technology Innovation Center of China Telecom Corporation, China; Kan Zheng, Beijing University of Posts and Telecommunications, China

4 E-MQS - A new Downlink scheduler for Real-time flows in LTE network
Duy-Huy Nguyen, Hang Nguyen, Éric Renault, Institut Mines-Telecom, Telecom SudParis, France

5 Low-Latency Communications in LTE Using Spatial Diversity and Encoding Redundancy
Stepan Kucera, Nokia, Ireland; Yu Yu, JAIST, Japan; Milind Buddhikot, Nokia, United States; Yuto Lim, JAIST, Japan

Tuesday, 20 September 2016 11:00-12:30 Fontaine C
4C: Positioning and Tracking I
Chair: Huaping Liu, Oregon State, USA

1 A Space-Time Fusion Scheme for Dynamic-Event Region Detection in Sensor Networks
Tsang-Yi Wang, National Sun Yat-sen University, Taiwan; Ming-Hsun Yang, Jwo-Yuh Wu, National Chiao Tung University, Taiwan

2 Energy-Efficient Cooperative Positioning in Mobile Social Networks
Chaofeng Zhang, Kaoru Ota, Mianxiong Dong, Muroran Institute of Technology, Japan

3 A Cooperative Localization Algorithm with Cluster Nodes Selection Based on Cramer-Rao Lower Bound
Yaping Zhu, Yueyue Zhang, Lianfeng Shen, Feng Yan, Tiecheng Song, Southeast University, China

4 Low-Cost Realtime Horizontal Curve Detection Using Inertial Sensors of a Smartphone
Shaohu Zhang, Myounggyu Won, South Dakota State University, United States; Sang H. Son, Daegu Gyeongbuk Institute of Science and Technology, Korea, Republic of

5 Ultra-wideband Aided Precision Parking for Wireless Power Transfer to Electric Vehicles in Real Life Scenarios
Janis Tiemann, Johannes Pillmann, Stefan Boecker, Christian Wietfeld, TU Dortmund, Germany

Tuesday, 20 September 2016 11:00-12:30 Fontaine D
4D: Spectrum Sensing I
Chair: Yuan Wu, Zhejiang University of Technology, China

1 A Modified Jarque-Bera Test for Spectrum Sensing in Cognitive Networks Subject to Rayleigh Fading
Fabricio Carvalho, Waslon Lopes, UFPB/UFCG, Brazil; Marcelo Alencar, UFCG, Brazil

2 A Novel q-Weighed Sequential Cooperative Energy Detection Method for Spectrum Sensing
Shaojie Liu, Sai Huang, Beijing University of Posts and Telecommunications, China; Wei Li, University of Victoria, Canada; Yifan Zhang, Zhiyong Feng, Beijing University of Posts and Telecommunications, China

3 A Novel Spectrum Sensing Mechanism Based on Distribution Discontinuity Estimation within Cognitive Radio
Yogesh Nijsure, Georges Kaddoum, Golnaz Ghodoosipour, Ecole de Technologie Superieure, Canada; Guofa Cai, Lin Wang, Xiamen University, China

4 Asymptotic Analysis of Cooperative Spectrum Sensing Under Noise Uncertainty
Jalal Khamse-Ashari, Carleton University, Canada; Hassan Halabian, Ericsson Canada, Canada; Mahmood Modarres Hashemi, Isfahan University of Technology, Iran, Islamic Republic of; Ioannis Lambadaris, Carleton University, Canada

5 Cooperative Sensing with Dependent Observations on BPSK Signal: to Quantize Amplitude or Sign
Huayan Guo, Wei Jiang, Wu Luo, Peking University, China

Tuesday, 20 September 2016 11:00-12:30 Fontaine E
4E: Network Security
Chair: Kuan Zhang, University of Waterloo, Canada

1 Secure and Energy Efficient Transmission in Multiuser uplink Wireless Networks
Hongliang He, Pinyi Ren, Qinghe Du, Li Sun, Yichen Wang, Xi'an Jiaotong University, China

2 Destination Assisted Secret Transmission in Wireless Relay Networks
Shaobo Jia, Jiayan Zhang, Honglin Zhao, Ruoyu Zhang, Harbin Institute of Technology, China

3 An Artificial Noise Scheme for Secure Communication in Heterogeneous D2D and Cellular Networks
Shiwei Yan, Yong Shang, Xiguang Zhang, Dehuai Li, Xiaobo Li, Peking University, China

4 Primary Secure Communication with the Cooperation of Energy Harvesting Secondary System
Dawei Wang, Pinyi Ren, Qinghe Du, Li Sun, Yichen Wang, Xi'an Jiaotong University, China

5 Trident: Context-based Reverse Authentication for Phishing AP Detection in Commodity WiFi Networks
Peng Zhao, Kaigui Bian, Ping Chen, Tong Zhao, Yichun Duan, Wei Yan, Peking University, China

Tuesday, 20 September 2016 11:00-12:30 Fontaine F
4F: SDN
Chair: Michel Kulhandjian, Global Prior Art Inc, Canada

1 SDN Enabled High Performance Multicast in Vehicular Networks
Zongjian He, Daqiang Zhang, Shaomin Zhu, Tongji University, China; Jiannong Cao, Xuefeng Liu, The Hong Kong Polytechnic University, Hong Kong

2 SDN Enabled Dual Cluster Head Selection and Adaptive Clustering in 5G-VANET
Xiaoyu Duan, Western University, Canada; Xianbin Wang, Western University, Canada; Yanan Liu, Western University, Canada; Kan Zheng, Beijing University of Posts and Telecommunications, China

3 Bandwidth Provisioning in Cache-enabled Software-defined Mobile Networks: A Robust Optimization Approach
Chengchao Liang, Fei Richard Yu, Carleton University, Canada

4 Network Virtualization Optimization in Software Defined Vehicular Ad-Hoc Networks
He Li, Kaoru Ota, Mianxiong Dong, Muroran Institute of Technology, Japan

5 A Proposal For Hybrid SDN C-RAN Architecturesfor Enhancing Control Signaling Under Mobility
Imad Al-Samman, Angela Doufexi, Mark Beach, University of Bristol, United Kingdom

Tuesday, 20 September 2016 11:00-12:30 Fontaine G
4G: Network Performance Evaluation
Chair: Hung-Yu Wei, National Taiwan University, Taiwan

1 LTE Field Performance for IoT Applications
Jin Yang, Lei Song, Adam Koeppe, Verizon Communications, United States

2 Performance Evaluation of Uplink Narrow-Band SCMA for 5G IoT
Chaolong Zhang, Jian Wang, Yourui Huangfu, Rong Li, Jun Wang, Huawei Technologies, Co. Ltd., China

3 Theoretical Analysis of Report Success Probability in IEEE 802.15.4-Based Smart Utility Networks
Tallal Elshabrawy, Mohamed Ashour, The German University in Cairo, Egypt; Joerg Robert, Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany

4 Throughput Evaluation of Dynamic Frame Slotted ALOHA for Spatially Distributed RFID Tags
Tallal Elshabrawy, Ezzeldin Shereen, The German University in Cairo, Egypt

5 Inversely Proportional Transmission Power and Carrier Sense Threshold Setting for WLANs: Experimental Evaluation of Partial Settings
Daichi Okuhara, Koji Yamamoto, Takayuki Nishio, Masahiro Morikura, Kyoto University, Japan; Hirantha Abeysekera, NTT Corporation, Japan

Tuesday, 20 September 2016 11:00-12:30 Fontaine H
4H: Wireless Power Transfer
Chair: Lian Zhao, Ryerson University, Canada

1 Frequency Switching for Simultaneous Wireless Information and Power Transfer
Dogay Altinel, Gunes Karabulut Kurt, Istanbul Technical University, Turkey

2 Successive Interference Cancellation for Throughput Maximization in Wireless Powered Communication Networks
Ming Lei, Xingjun Zhang, Tong Zhang, Xi'an Jiaotong University, China; Lei Lei, Qing He, Di Yuan, Linköping University, Sweden

3 Energy-Efficient Full-Duplex Wireless Information and Power Transfer
Tewodros Zewde, M. Cenk Gursoy, Syracuse University, United States

4 Opportunistic Energy Scheduling in Wireless Powered Sensor Networks
Dusit Niyato, Ping Wang, Nanyang Technological University, Singapore; Dong In Kim, Sungkyunkwan University (SKKU), South Korea; Zhu Han, University of Houston, United States

5 Optimum Zoning in RF-Recharged Sensor Networks
Vojislav B. Misic, Jelena Misic, Mohammad S. I. Khan, Ryerson University, Canada

Tuesday, 20 September 2016 11:00-12:30 Fundy
4I: Coding
Chair: Lars Rasmussen, KTH Royal Institute of Technology, Sweden

1 Construction of Polar Codes Concatenated to Space-Time Block Coding in MIMO System
Bowen Feng, Jian Jiao, Sha Wang, Shaohua Wu, Qinyu Zhang, Harbin Institute of Technology Shenzhen Graduate School, China

2 Joint Source-Channel Optimization of VectorQuantization with Polar Codes
Mohammad Sadegh Mohammadi, Aarhus University, Denmark; Eryk Dutkiewicz, University of Technology Sydney, Australia; Qi Zhang, Aarhus University, Denmark

3 A Novel Interleaving Scheme for Polar Codes
Ya Meng, Liping Li, Yanjun Hu, Anhui University, China

4 On the Polar Code Encoding in Fading Channels
Rui Deng, Liping Li, Yanjun Hu, Anhui University, China

5 Spatially-Coupled LDPC Coding in Threshold-Based Lossy Forwarding Scheme
Dushantha Nalin K. Jayakody, University of Tartu, Estonia; Eirik Rosnes, University of Bergen, Norway

Tuesday, 20 September 2016 11:00-12:30 Fontaine A and B
4P: Vehicular Networks Posters
Chair: Hongzhi Zhu, Shanghai Jiao Tong University, China

1 Modeling Urban ITS Communication via Stochastic Geometry Approach
Tatsuaki Kimura, Hiroshi Saito, Hirotada Honda, Ryoichi Kawahara, NTT, Japan

2 Service-oriented Communication for Controller Area Networks
Marco Wagner, Sebastian Schildt, Michael Poehnl, Robert Bosch GmbH, Germany

3 Tradeoffs in PRACH Bandwidth Partitioning for VM2M Overlay Network in LTE
Nargis Khan, Jelena Misic, Vojislav B. Misic, Ryerson University, Canada

4 Performance Evaluation of Traffic Information Dissemination Protocols for Dynamic Route Planning Application in VANETs
Ibrahim Rashdan, Fabian de Ponte Müller, Stephan Sand, German Aerospace Center (DLR), Germany

5 Protocol-Compliant DoS Attacks on CAN: Demonstration and Mitigation
Wei Si, David Starobinski, Boston University, United States; Moshe Laifenfeld, Israel

6 EVTour: Online Scheduling System for Tours with Multiple Destinations by One-Way EV Sharing
Naoki Shibata, Tomoyuki Ueda, Nara Institute of Science and Technology, Japan; Weihua Sun, Shiga University, Japan; Minoru Ito, Nara Institute of Science and Technology, Japan

Tuesday, 20 September 2016 14:00-15:30 La Salle
5A: Channel characterization
Chair: Stefan Schwarz, TU Wien, Austria

1 Angular Resolved Pathloss Measurements in Urban Macrocell Scenarios at 28 GHz
Christina Larsson, Bengt-Erik Olsson, Jonas Medbo, Ericsson AB, Sweden

2 Propagation Characteristics of Indoor Radio Channel from 3.5 GHz to 28 GHz
Fusheng Huang, Lei Tian, Beijing University of Posts and Telecommunications, China; Yi Zheng, China Mobile Research Institute, China; Jianhua Zhang, Beijing University of Posts and Telecommunications, China

3 Spectrogram Analysis of Multipath Fading Channels Under Variations of the Mobile Speed
Matthias Pätzold, University of Agder, Norway; Carlos A. Gutierrez, Universidad Autonoma de San Luis, Mexico

4 The Variation on the Uplink Multipaths' DOA Distribution for the Maneuvering Mobile Station in the Wireless Cellular Network
Weiyan Chen, Sichuan University, China; Yue Ivan Wu, Sichuan University, China

5 Millimeter-Wave Human Blockage at 73 GHz with a Simple Double Knife-Edge Diffraction Model and Extension for Directional Antennas
George MacCartney, Sijia Deng, Shu Sun, Theodore Rappaport, NYU Tandon School of Engineering, United States

5B: 5G II
Chair: He Li, Muroran Institute of Technology, Japan

1 Signalling Minimization Framework for Short DataPacket Transmission in 5G
Danish Aziz, Nokia Bell Labs, Germany; Hajo Bakker, Nokia Bell Labs, Germany; Anton Ambrosy, Nokia Bell Labs, Germany; Qi Liao, Nokia Bell Labs, Germany

2 A Context-Aware User-Driven Framework for Network Selection in 5G Multi-RAT Environments
Faouzi Bouali, Klaus Moessner, University of Surrey, United Kingdom; Michael Fitch, BT Research, United Kingdom

3 The potential of offloading and spectrum sharing for 5G vehicular infotainment
John Harris, Mark Beach, Andrew Nix, Paul Thomas, University of Bristol, United Kingdom

4 Narrow-Band SCMA: a New Solution for 5G IoT Uplink Communications
Jian Wang, Chaolong Zhang, Rong Li, Guijie Wang, Jun Wang, Huawei Technologies, Co. Ltd., China

5 Ergodic Rate Analysis of Massive MIMO Systems in K-Fading Environment
Muhammad Tauseef Mushtaq, Syed Ali Hassan, National University of Sciences and Technology, Pakistan; Dushantha Nalin K. Jayakody, National Research Tomsk Polytechnic University, Russian Federation

Tuesday, 20 September 2016 14:00-15:30 Fontaine C
5C: Spectrum Management I
Chair: Li Wang, Beijing University of Posts and Telecommunications, China

1 Dynamic Licensed Shared Access - A new architecture and spectrum allocation techniques
Valerio Frascolla, Intel, Germany; M. Majid Butt, Nicola Marchetti, Trinity College Dublin, Ireland; António J. Morgado, Alvaro Gomes, Portugal Telecom Inovação, Portugal; Konstantinos Voulgaris, Constantinos B. Papadias, Athens Information Technology, Greece

2 SOSAP: A Pareto-efficient Spectrum Access Protocol for Cognitive Radio Networks
Stefano Iellamo, Foundation for ResearchTechnology Hellas, Greece; Marceau Coupechoux, Telecom ParisTech, France; Zaheer Khan, University of Oulu, Finland

3 Sparsity-Aware Narrowband Interference Mitigation and Subcarriers Selection in OFDM-Based Cognitive Radio Networks
Ala Gouissem, Ridha Hamila, Sebti Foufou, Qatar University, Qatar; Naofal Al-Dhahir, UT Dallas, United States

4 Scheduling in Dynamic Spectrum Access Networks: Throughput and Fairness Tradeoffs
Enas Khairullah, Mainak Chatterjee, University of Central Florida, United States

5 Energy-Aware Optimal Data Offloading over Unlicensed Spectrums
Yuan Wu, Haohan Chai, Liping Qian, Weidang Lu, Zhejiang University of Technology, China; Qinglin Zhao, Macau University of Science and Technology, Macau; Changsheng Yu, Nokia Solutions and Networks System Technology, Co. Ltd, China

Tuesday, 20 September 2016 14:00-15:30 Fontaine D
5D: Cooperative communication II
Chair: Koji Yamamoto, Kyoto University, Japan

1 Combined Physical Network Coding and Friendly Jamming for Secure Wireless Cooperative Communications
Dehuai Li, Shiwei Yan, Yong Shang, Xiguang Zhang, Peking University, China

2 Inter-Subnetwork Interference Minimization in Partially Connected Two-Way Relaying Networks
Daniel Papsdorf, Technische Universität Darmstadt, Germany; Xiang Li, University of Rostock, Germany; Tobias Weber, University of Rostock, Germany; Anja Klein, Technische Universität Darmstadt, Germany

3 Secrecy Performance of Dual-hop Threshold Relaying System with Diversity Reception
Chinmoy Kundu, Memorial University, Canada; Telex M. N. Ngatched, Memorial University, Canada; Octavia A. Dobre, Memorial University, Canada

4 Fairness-aware Resource Allocation in Relay-enhanced TD-LTE-A Systems
Xuanli Wu, Yujie Pei, Harbin Institute of Technology, China; Fabrice Labeau, McGill University, Canada; Wanjun Zhao, Harbin Institute of Technology, China

5 Compress-and-Forward Relaying: Prototyping and Experimental Evaluation using SDRs
Irfan Ullah, Lahore University of Management Sciences, Pakistan; Fawad Ud Din, McGill University, Canada; Jawwad Chattha, Momin Uppal, Lahore University of Management Sciences, Pakistan

Tuesday, 20 September 2016 14:00-15:30 Fontaine E
5E: Positioning and Tracking II
Chair: Khurram Ali, COMSATS Institute of Information Technology, Lahore, Pakistan

1 Enhanced 3D Geolocation Algorithm for LTE Call Traces
Razvan-Florentin Trifan, Regis Lerbour, Yann Le Helloco, InfoVista, France

2 Enhancing Improved Heuristic Drift Elimination for Wrist-Worn PDR Systems in Buildings
Luis E. Díez, Alfonso Bahillo, Safaa Bataineh, Antonio D. Masegosa, Asier Perallos, University of Deusto, Spain

3 Hotspot Identification Through Call Trace Analysis
Regis Lerbour, Yann Le Helloco, Razvan-Florentin Trifan, InfoVista, France

4 Particle-based Message Compression for Cooperative Localization
Rico Mendrzik, Jan Lewandosky, Gerhard Bauch, Hamburg University of Technology, Germany

5 PILoT: A Precise IMU based Localization Technique for Smart Phone Users
Muhammad Ali Chattha, Ijaz Haider Naqvi, Lahore University of Management Sciences, Pakistan

Tuesday, 20 September 2016 14:00-15:30 Fontaine F
5F: Beamforming I
Chair: Geoffrey Messier, University of Calgary, Canada

1 Joint Beamforming and Remote Radio Head Selection in Limited Fronthaul C-RAN
Phuong Luong, École de Technologie Supérieure, Canada; Le-Nam Tran, Maynooth University, Ireland; Charles Despins, François Gagnon, École de Technologie Supérieure, Canada

2 Beamforming in Coexisting Wireless Systems with Uncertain Channel State Information
Tuan Anh Le, Middlesex University, United Kingdom; Keivan Navaie, Lancaster University, United Kingdom; Quoc-Tuan Vien, Huan Xuan Nguyen, Middlesex University, United Kingdom

3 Virtual Massive MIMO Beamforming Gains for 5G User Terminals
Muhammad Bilal Amin, Nokia Bell Labs, Germany; Wolfgang Zirwas, Nokia Bell Labs, Germany; Martin Haardt, TU Ilmenau, Germany

4 Power Allocation for AN-aided Beamforming Design in MISO Wiretap Channels with Finite-alphabet Signaling
Xiaoran Liu, Dongtang Ma, Jun Xiong, Wei Li, Longwang Cheng, National University of Defense Technology, China

5 Beamforming Optimization for Multiuser Wireless Systems using Meta-Heuristics
Pedro Bento, Carlos Henggeler Antunes, Marco Gomes, University of Coimbra, Portugal; Rui Dinis, Instituto de Telecomunicações, FCT-UNL, Portugal; Vitor Silva, University of Coimbra, Portugal

Tuesday, 20 September 2016 14:00-15:30 Fontaine G
5G: Non-orthogonal Multiple Access
Chair: Fumiyuki Adachi, Tohoku University, Japan

1 NOMA for Future Cellular Systems
Kenichi Higuchi, Tokyo University of Science, Japan

2 Non-orthogonal Multiple Access with SIC Error Propagation in Downlink Wireless MIMO Networks
Haijian Sun, Bei Xie, Rose Qingyang Hu, Utah State University, United States; Geng Wu, Intel Corporation, United States

3 Joint Clustering and Precoding for a Downlink Non-Orthogonal Multiple Access System with Multiple Antennas
Chin-Liang Wang, Jyun-Yu Chen, Siu-Hang Lam, National Tsing Hua University, Taiwan; Pei Xiao, University of Surrey, United Kingdom

4 Uplink Contention Based Transmission with Non-Orthogonal Spreading
ZhuYan Zhao, DeShan Miao, YuanTao Zhang, JingYuan Sun, HongChao Li, Nokia, China; Klaus Pedersen, Nokia, Denmark

5 Downlink Non-Orthogonal Multiple Access (NOMA) Constellation Rotation
Jian Zhang, Xin Wang, Fujitsu Research and Development Center Co., Ltd., Beijing, China; Tsuyoshi Hasegawa, Fujitsu Laboratories Ltd., Japan; Tokuro Kubo, Fujitsu Laboratories Ltd., Japan

Tuesday, 20 September 2016 14:00-15:30 Fontaine H
5H: Resource Allocation II
Chair: Gina Martinez, Lewis University, USA

1 Dynamic Inter-Channel Resource Allocation for Massive M2M Control Signaling Storm Mitigation
Hung-Yu Wei, National Taiwan University, Taiwan; Ting-Hua Chen, National Taiwan University, Taiwan; Jun-Wei Chang, National Taiwan University, Taiwan

2 Resource Allocation and Massive Access Control using Relay Assisted Machine-Type Communication in LTE Networks
Lilatul Ferdouse, Alagan Anpalagan, Ryerson University, Canada; Koji Yamamoto, Kyoto University, Japan; Waleed Ejaz, Ryerson University, Canada; Hyung Kong, University of Ulsan, Korea, Republic of

3 User Selection and Power Allocation Schemes for Downlink NOMA Systems with Imperfect CSI
Wenbo Cai, Chen Chen, Peking University, China; Lin Bai, Beihang University, China; Ye Jin, Peking University, China; Jinho Choi, Gwangju Institute of Science and Technology, Korea, Republic of

Tuesday, 20 September 2016 16:00-17:30 La Salle
6A: Multiuser MIMO
Chair: Xianbin Wang, Western University, Canada

1 Joint Tx/Rx Signal Processing for Distributed Antenna MU-MIMO Downlink
Shinya Kumagai, Yuta Seki, Fumiyuki Adachi, Tohoku University, Japan

2 Energy Efficient Pilot and Data Power Allocation in Multi-Cell Multi-User Massive MIMO Communication Systems
Ye Zhang, Wei-Ping Zhu, Concordia University, Canada

4 Utility Based Resource Management in D2DNetworks using Mesh Adaptive Direct SearchMethod
Mushtaq Ahmad, Muhammad Naeem, Ashfaq Ahmed, Muhammad Iqbal, COMSATS Institute of Information Technology, Wah Campus, Pakistan; Alagan Anpalagan, Ryerson University, Canada; Waleed Ejaz, Ryerson University, Canada

5 Opportunistic forwarding using rateless codes in OFDMA multihop networks
Fabian Hohmann, Anja Klein, TU Darmstadt, Germany

Tuesday, 20 September 2016 14:00-15:30 Fontaine A and B
5P: Wireless Networks Posters I
Chair: Kuan Zhang, University of Waterloo, Canada

1 Control of performance in mobile networks in the presence of user impatience
Amal Abdel Razzac, Institut Mines-Telecom, Telecom SudParis, UMR CNRS 5157, Evry, France; Tijani Chahed, Institut Mines-Telecom, Telecom SudParis, UMR CNRS 5157, Evry, France; Salah Eddine Elayoubi, Orange Labs, Issy-les-Moulineaux, France

2 On Accessing Heterogeneous Data Items using Network Coding in Wireless Broadcast
Md. Ashiqur Rahman, Khulna University of Engineering & Technology, Bangladesh; G. G. Md. Nawaz Ali, Yumeng Gao, Nanyang Technological University, Singapore; Syeda Khairunnesa Samantha, Iowa State University, United States; Peter Han Joo Chong, Auckland University of Technology, New Zealand

3 Dynamic Multi-SIM Gap Creating Procedure
Jakob Lindbjerg Buthler, Troels Sorensen, Aalborg University, Denmark

4 Secrecy Analysis of A MIMO Full-Duplex ActiveEavesdropper with Channel Estimation Errors
Long Kong, Universite du Quebec, ETS, Canada; Jiguang He, Centre for Wireless Communications, Finland; Georges Kaddoum, Universite du Quebec, ETS, Canada; Satyanarayana Vuppala, University of Edinburgh, United Kingdom; Lin Wang, Xiamen University, China

5 Using Logistic Trust for Event Learning and Misbehaviour Detection
Saneeha Ahmed, Kemal Tepe, University of Windsor, Canada

6 On the Virtualization and Dynamic Orchestration of Satellite Communication Services
Ramon Ferrús, Universitat Politècnica de Catalunya, Spain; Harilaos Koumaras, National Centre for Scientific Research Demokritos, Greece; Oriol Sallent, Universitat Politècnica de Catalunya, Spain; Tinku Rasheed, Center for Research and Telecommunication Experimentation for Networked communities, Italy; Emmanuel Duros, OneAccess, France; Roberto Riggio, Center for Research and Telecommunication Experimentation for Networked communities, Italy; Nicolas Kuhn, Patrick Gélard, Centre National d'Etudes Spatiales, France; Toufik Ahmed, CNRS-LaBRI, University of Bordeaux, France

3 Low Complexity Node Selection Algorithms in MU-MIMO Energy Harvesting WSNs
Amina Hentati, Ecole polytechnique de Montreal, Canada; Elmahdi Driouch, University of Quebec at Montreal, Canada; Jean-François Frigon, Ecole polytechnique de Montreal, Canada; Wessam Ajib, University of Quebec at Montreal, Canada

4 Sum Capacity of Block-Diagonalized Multiuser MIMO Downlink with Channel Estimation and Finite-Rate CSI Feedback Link
S. Alireza Banani, Xplornet Communications Inc., Canada; Ali Rafiei, University of Technology Sydney, Australia; Rodney G. Vaughan, Simon Fraser University, Canada

5 Experimental Verification of Null-Space Expansion for Multiuser Massive MIMO using Measured Channel State Information
Tatsuhiko Iwakuni, NTT Corporation, Japan; Kazuki Maruta, NTT Corporation, Japan; Atsushi Ohta, NTT Corporation, Japan; Yushi Shirato, NTT Corporation, Japan; Takuto Arai, NTT Corporation, Japan; Masataka Iizuka, NTT Corporation, Japan

Tuesday, 20 September 2016 16:00-17:30 Loungueuil
6B: D2D II
Chair: He Li, Muroran Institute of Technology, Japan

1 Optimizing Channel Allocation for D2D Overlaying Multi-channel Downlink Cellular Networks
Jiajia Liu, Jiahao Dai, Xidian University, China; Yuichi Kawamoto, Nei Kato, Tohoku University, Japan

2 Resource Scheduling for Content Downloading Network with D2D Support
Lina Yang, Qiang Wang, Wei Wei, Jianou Huang, Beijing University of Posts and Telecommunications, China

3 Scheduling for Device-to-Device Communication Considering Spatial Reuse and User Fairness in Public Safety LTE
Kazushi Muraoka, Taichi Ohtsuji, Hiroaki Aminaka, Gen Motoyoshi, Yasuhiko Matsunaga, NEC Corporation, Japan

4 Scheduling in D2D Underlaid Cellular Networks with Deadline Constraints
Yi Li, M. Cenk Gursoy, Senem Velipasalar, Syracuse University, United States

5 Transmission Mode Selection and Resource Allocation for D2D Unicast Communications
Richa Gupta, Suresh Kalyanasundaram, Ajith Kumar P R, Nokia, India

Tuesday, 20 September 2016 16:00-17:30 Fontaine C
6C: Transmission Performance Analysis
Chair: David Matolak, University of South Carolina, USA

1 Arbitrary Constellations with Coded Maximum Ratio Transmission over Downlink Nakagami-m Fading Channels
Mehmet Cagri Ilter, Carleton University, Canada; Pawel A. Dmochowski, Victoria University of Wellington, New Zealand; Halim Yanikomeroglu, Carleton University, Canada

2 Non-asymptotic Outage Probability of Large-scale MU-MIMO Systems with Linear Receivers
Mengmeng Liu, Jianhua Zhang, Chao Xu, Ping Zhang, Beijing University of PostsTelecommunications, China; Ye Wu, Huawei Technologies Co., Ltd., China

3 Outage Probability of Two-Way Full-Duplex AF Relay Systems over Nakagami-m Fading Channels
Asil Koc, Ibrahim Altunbas, Istanbul Technical University, Turkey; Abbas Yongacoglu, University of Ottawa, Canada

4 Performance Analysis of Hybrid-ARQ with Chase Combining over Cooperative Relay Network with Asymmetric Fading Channels
Yun Ai, Michael Cheffena, Norwegian University of Science and Technology, Norway

5 Performance Analysis of Two-Way Relaying System with RF-EH and Multiple Antennas
Duc-Dung Tran, Duy Tan University, Viet Nam; Ha Vu Tran, University of Quebec, Canada; Hung Tran, Mälardalen University, Sweden; Dac-Binh Ha, Duy Tan University, Viet Nam; Georges Kaddoum, University of Quebec, Canada

Tuesday, 20 September 2016 16:00-17:30 Fontaine D
6D: Green Wireless Networking II
Chair: Peng-Yong Kong, Khalifa University, United Arab Emirates

1 Green Cellular Demand Control with User-in-the-loop Enabled by Smart Data Pricing using an Effective Quantum (eBit) Tariff
Rainer Schoenen, HAW Hamburg, Germany; Hamza Umit Sokun, Carleton University, Canada; Halim Yanikomeroglu, Carleton University, Canada

2 BaLAnce: Battery Lifetime-Aware LTE Switching-Off Strategy in Green Network Infrastructures
Christoph Ide, Oleg Belov, Dennis Kaulbars, Christian Wietfeld, TU Dortmund, Germany

3 Energy-efficient Access Scheme with Joint Consideration on Backhauling in UDN
Xi Li, Hong Ji, Ke Wang, Heli Zhang, Beijing University of Posts and Telecommunications, China

4 An Energy-Saving Algorithm Based on Base Station Sleeping in Multi-hop D2D Communication
Yanan Zhang, Yong Zhang, Da Guo, Mei Song, Beijing University of Posts and Telecommunications, China

5 Regular and Static Sector-Based Cell Switch-Off Patterns
Tamer Beitelmal, Sebastian Szyszkowicz, Halim Yanikomeroglu, Carleton University, Canada

Tuesday, 20 September 2016 16:00-17:30 Fontaine E
6E: Vehicular Networks - Positioning
Chair: Torsten Lorenzen, Leibniz Universität Hannover, Germany

1 Enhanced Position Verification for VANETs using Subjective Logic
Rens W. van der Heijden, Ala'a Al-Momani, Frank Kargl, Ulm University, Germany; Osama M.F. Abu-Sharkh, Princess Sumaya University for Technology, Jordan

2 Absolute Localization via DSRC Signal Strength
Samir Al-Stouhi, Honda R&D Americas Inc, United States

3 Privacy-Preserving Real-Time Navigation System Using Vehicular Crowdsourcing
Jianbing Ni, University of Waterloo, Canada; Xiaodong Lin, University of Ontario Institute of Technology, Canada; Kuan Zhang, Xuemin (Sherman) Shen, University of Waterloo, Canada

4 A Roadside Unit-Based Localization Scheme to Improve Positioning for Vehicular Networks
Frances Santos, Ademar Akabane, University of Campinas, Brazil; Roberto Yokoyama, Federal University of Technology Parana, Brazil; Antonio Loureiro, Federal University of Minas Gerais, Brazil; Leandro Villas, University of Campinas, Brazil

5 A Novel Method for Smoothing Raw GPS Data with Low Cost and High Reliability
Xun Zhou, Changle Li, Xiaoming Yuan, Bing Xia, Xidian University, China; Guoqiang Mao, University of Technology, Sydney, Australia; Lei Xiong, Beijing Jiaotong University, China

Tuesday, 20 September 2016 16:00-17:30 Fontaine F
6F: Content Distribution
Chair: Xiaohua Tian, Shanghai Jiao Tong University, China

1 Strategic Mobility and Cooperative Caching in DTN: A Social Dilemma Perspective
Prakash Chaki, Cloud System Research Laboratories, NEC Corporation, Japan; Takafumi Kanazawa, Graduate School of Engineering Science, Osaka University, Japan; Kazunori Miyoshi, Cloud System Research Laboratories, NEC Corporation, Japan

2 Social-Aware Data Dissemination via Opportunistic Device-to-Device Communications
Yiming Zhao, Wei Song, University of New Brunswick, Canada

3 Distribution-based Energy Efficiency Analysis of Intelligent Content Service Network
Yong Tan, Tsinghua University, China; Xiaolong Fu, Tsinghua University, China; Xiaofeng Zhong, Tsinghua University, China; Dongxing Jiang, Tsinghua University, China

4 Performance Analysis for Wireless Distributed Storage via D2D Links
Yinan Ding, Li Wang, Huaqing Wu, Shuangshuang Ma, Beijing University of Posts and Telecommunications, China; Antti Yla-Jaaski, Aalto University, Finland

5 Fault-Tolerant Mechanism for Multimedia Transmission in Wireless Sensor Networks
Mohamed Nacer Bouatit, CNAM, France; Selma Boumerdassi, CNAM/INRIA, France; Pascale Minet, INRIA, France; Adel Djama, ESI, Algeria

Tuesday, 20 September 2016 16:00-17:30 Fontaine G
6G: Diversity
Chair: Waslon Terllizzie Araújo Lopes, Federal University of Paraíba

1 CAF Diversity Combining for Spectrum Sensing by Test Statistics Sharing with Time-Averaged Weights
Daiki Cho, Atsushi Kondo, Shusuke Narieda, Kenta Umebayashi, Tokyo University of Agriculture and Technology, Japan

2 Polarization Diversity in Ring Topology Networks
Philippe Ezran, Jerusalem College of Technology / CentraleSupelec, Israel; Yoram Haddad, Jerusalem College of Technology, Israel; Merouane Debbah, CentraleSupelec, France

3 Distributed Antenna Selection for OFDM Space-Time Block Coded Diversity
Hiroyuki Miyazaki, Fumiyuki Adachi, Tohoku University, Japan

4 Diversity Trade-Offs and Joint Coding Schemes for Highly Reliable Wireless Transmissions
David Oehmann, TU Dresden, Germany; Ahmad Awada, Nokia Bell Labs, Germany; Ingo Viering, Nomor Research GmbH, Germany; Meryem Simsek, Gerhard Fettweis, TU Dresden, Germany

5 Performance Analysis of Opportunistic Systems Employing Maximal Ratio Combining and Antenna Array
Nathaly Veronica Orozco Garzon, Henry Ramiro Carvajal Mora, Celso de Almeida, State University of Campinas (UNICAMP), Brazil

Tuesday, 20 September 2016 16:00-17:30 Fontaine H
6H: Routing
Chair: Koji Yamamoto, Kyoto University, Japan

1 Fast loop-free transition of routing protocols
Nina Pelagie Bekono, Nancy El Rachkidy, Alexandre Guitton, Clermont Université, Université Blaise Pascal, France

2 The Impact of Propagation Models in the Performance of Ad Hoc Routing Protocols for Urban VANET
William Angeles Galvan, Vinicius Pozzobon Borin, Anelise Munaretto, Mauro Fonseca, UTFPR, Brazil

3 Maximum Lifetime SMDP Routing for Energy-harvesting Wireless Sensor Networks
Gina Martinez, Lewis University, United States; Chi Zhou, Illinois Institute of Technology, United States

4 SPARTAN: A Solution to Prevent Traffic Jam with Real-Time Alert and Re-routing for Smart City
Allan Souza, University of Campinas, Brazil; Azzedine Boukerche, University of Ottawa, Canada; Guilherme Maia, Federal University of Minas Gerais, Brazil; Eduardo Cerqueira, Federal University of Para, Brazil; Antonio Loureiro, Federal University of Minas Gerais, Brazil; Leandro Villas, University of Campinas, Brazil

5 Striped-Flooding: Improve Scalability and Energy Efficiency of Flooding Algorithm in Wireless Sensor and Actor Networks
Haotian Yan, Zhezhuang Xu, Jianfeng He, Liquan Chen, Hao Jiang, Fuzhou University, China

Tuesday, 20 September 2016 16:00-17:30 Fontaine A and B
6P: Wireless Networks Posters II
Chair: Rung-Hung Gau, National Chiao Tung University, Taiwan

1 Robust Spectrum Sharing under Channel Uncertainty for Cognitive Radio Networks
Le Wang, Jin Chen, Guochun Ren, Guoru Ding, Zhen Xue, Haichao Wang, PLA University of Science and Technology, China

2 An Adaptive Ternary Query Splitting based Tag Anti-collision Protocol for Mobile RFID Systems
Yi Jiang, Ruonan Zhang, Wei Cheng, Bin Li, Wei Sun, Northwestern Polytechnical University, China

3 An Experimental Study on Network-Listening Based Synchronization with Loop-Back Self-Interference Canceller
Sho Nabatame, Mitsukuni Konishi, Atsushi Nagate, Teruya Fujii, SoftBank Corp., Japan

4 Mitigating Power Consumption in Mobile Devices with Dynamic Triggering of XMPP Ping Requests
Kiran Kumar Guduru, Sachin Dev, Rajaram Hanumanthacharya Naganur, Samsung Electronics, India

5 Robots-Aided Participatory Crowdsourcing with Limited Task Budget
Bo Zhang, Chi Harold Liu, Zheng Zhang, Beijing University of Posts and Telecommunications, China; Ziyu Ren, Tsinghua University, China; Jian Ma, Wendong Wang, Beijing University of Posts and Telecommunications, China

6 Radio Resource Management Techniques for eMBB and mMTC services in 5G Dense Small Cell Scenarios
Nurul Huda Mahmood, Mads Lauridsen, Gilberto Berardinelli, Davide Catania, Preben Mogensen, Aalborg University, Denmark

Wednesday 21 September 2016

Wednesday, 21 September 2016 11:00-12:30 La Salle
7A: Full Duplex Systems
Chair: Li-Chun Wang, National Chiao Tung University, Taiwan

1 Scheduling and transmission point selection methods for space division full duplex systems
Lei Song, Weiwei Wang, Xin Wang, Jian Zhang, Jianming Wu, Fujitsu R&D Center Co., Ltd, Canada

2 Full Duplex Medium Access Control Protocol for Asymmetric Traffic
Md. Abdul Alim, Takashi Watanabe, Osaka University, Japan

3 Asynchronous Full-Duplex Cognitive Radio
Vahid Towhidlou, Mohammad Shikh Bahaei, King's College London, United Kingdom

4 Sum-Power Minimization Under Rate Constraints inFull-Duplex MIMO Systems

Ali Cagatay Cirik, University of British Columbia, Canada; Omid Taghizadeh, RWTH Aachen University, Germany; Lutz Lampe, University of British Columbia, Canada; Rudolf Mathar, RWTH Aachen University, Germany; Yingbo Hua, University of California Riverside, United States

5 Dynamic Resource Allocation for Full-Duplex OFDMA Wireless Cellular Networks

Tam Thanh Tran, Vu Nguyen Ha, Long Bao Le, Andre Girard, INRS, Canada

Wednesday, 21 September 2016 11:00-12:30 Loungueuil

7B: Channel modeling
Chair: Dennis Rose, Technische Universität Braunschweig

1 A Simple Statistical Signal Loss Model for Deep Underground Garage

Huan Nguyen Cong, Lucas Chavarria Gimenez, Aalborg University, Denmark; Istvan Kovacs, Nokia Bell Labs, Denmark; Ignacio Rodriguez, Troels Bundgaard Sørensen, Preben Mogensen, Aalborg University, Denmark

2 Modeling the Evolution of Line-of-Sight Blockage for V2V Channels

Mate Boban, Xitao Gong, Wen Xu, Huawei Technologies Duesseldorf GmbH, Germany

3 Modelling of Human Body Shadowing Based on 28 GHz Indoor Measurement Results

Xubin Chen, Lei Tian, Pan Tang, Jianhua Zhang, Beijing University of Posts and Telecommunications, China

4 Path Loss Model Based on Cluster at 28GHz in the Office and Corridor Environments

Lai Zhou, Limin Xiao, Jiahui Li, Zhi Yang, Jin Lian, Shidong Zhou, Tsinghua University, China

5 Moment-Based Parameter Estimation for the Two-Wave with Diffuse Power Fading Model

Jesus Lopez-Fernandez, Laureano Moreno-Pozas, Eduardo Martos-Naya, F. Javier Lopez-Martinez, Universidad de Malaga, Spain

Wednesday, 21 September 2016 11:00-12:30 Fontaine C

7C: Spectrum Sensing II
Chair: Long Le, INRS, University of Quebec, Canada

1 Energy Detection with Diversity Combining Over KG Fading For Cognitive VANET

Haroon Rasheed, Bahria University Karachi, Pakistan; Farah Haroon, IIEE-PCSIR, Pakistan; Nandana Rajatheva, University of Oulu, Finland

2 Improved Cuckoo Search Algorithm for Spectrum Sensing in Sparse Satellite Cognitive Systems

Wanmai Yuan, Mingchuan Yang, Qing Guo, Xinyu Wang, Xibao Feng, Harbin Institute of Technology, China

3 Joint Optimization of Energy Harvesting and Spectrum Sensing for Energy Harvesting Cognitive Radio

Shaojie Zhang, Haitao Zhao, National University of Defense Technology, China; Abdelhakim Hafid, University of Montreal, Canada; Shan Wang, National University of Defense Technology, China

4 Mean Spectral Radius Detection for Cognitive Radio

Yulong Gao, Xinsheng Han, Yongkui Ma, Harbin Institute of Technology, China

5 Positioning Primary Receiver for Underlay Spectrum Sharing in Cognitive Radio Networks

Guodong Zhao, Bo Chang, Zhi Chen, Liying Li, University of Electronic Science and Technology of China, China

Wednesday, 21 September 2016 11:00-12:30 Fontaine D

7D: Energy Efficient Transmission
Chair: Xi Li, Beijing University of Posts and Telecommunications, China

1 Power Efficiency of Millimeter Wave Transmission Systems with Large Number of Antennas

Gaojian Wang, Andreas Bytyn, Dara Khajavi, Yanlu Wang, Renato Negra, Gerd Ascheid, RWTH Aachen University, Germany

2 Energy Efficiency Maximization for Downlink OFDMA Systems with Feedback Channel Capacity Constraints

Xunan Li, Chen Chen, Peking University, China; Lin Bai, Beihang University, China; Ye Jin, Peking University, China; Jinho Choi, Gwangju Institute of Science and Technology, Korea, Republic of

3 Enhanced Control Signal and Data Detection for 5G Multicarrier Low-Power Communications

Yejian Chen, Mark Doll, Bell Labs, Stuttgart, Germany

4 Time Reversal SWIPT Networks with an ActiveEavesdropper: SER-Energy Region Analysis

Ha-Vu Tran, Georges Kaddoum, University of Quebec, Canada; Hung Tran, Mälardalen University, Sweden; Duc-Dung Tran, Dac-Binh Ha, Duy Tan University, Viet Nam

5 An Energy-Efficient and Self-regioning based RPL for Low-power and Lossy Networks

Ming Zhao, G. G. Md. Nawaz Ali, Rongxing Lu, Nanyang Technological University, Singapore; Peter Han Joo Chong, Auckland University of Technology, New Zealand

Wednesday, 21 September 2016 11:00-12:30 Fontaine E

7E: Cloud and Smart Grid
Chair: Dusit Niyato, Nanyang Technological University, Singapore

1 Game Theoretic Approach to Demand Side Management in Smart Grid with User-Dependent Acceptance Prices

Panagiotis D. Diamantoulakis, Koralia N. Pappi, Aristotle University of Thessaloniki, Greece; Peng-Yong Kong, Khalifa University of Science, Technology and Research, United Arab Emirates; George K. Karagiannidis, Aristotle University of Thessaloniki, Greece

2 DSA-based Energy Efficient Cellular Networks: Integration with The Smart Grid.

Hany Kamal Hassan, Amr Mohamed, Abdulla Alali, Qatar University, Qatar

3 Reducing Energy Consumption for Reconfiguration in Cloud Data Centers

Omar Chakroun, Soumaya Cherkaoui, Universite de Sherbrooke, Canada

4 An Enhanced Scheduling Mechanism for Elephant Flows in SDN-based Data Center

Zehui Liu, Beijing Jiaotong University, China; Deyun Gao, Beijing Jiaotong University, China; Ying Liu, Beijing Jiaotong University, China; Hongke Zhang, Beijing Jiaotong University, China

5 D2D Network-assisted Discovery through Keyword Matching for offering Cloud Services

Salam Doumiati, American University of Beirut, Lebanon; Hassan Artail, American University of Beirut, Lebanon; Karim Kabalan, American University of Beirut, Lebanon

Wednesday, 21 September 2016 11:00-12:30 Fontaine F

7F: Vehicular Networks - Protocols
Chair: Hongzhi Zhu, Shanghai Jiao Tong University, China

1 A Novel Architecture and Mechanism for On-demand Services in Vehicular Networks with Minimum Overhead in Target Vehicle Tracking

Mehdi Sharifi Rayeni, Abdelhakim Senhaji Hafid, Pratap Kumar Sahu, University of Montreal, Canada

2 A Scalabale Application and System level-Based Communication Scheme for V2V Communications
Zaydoun Rawashdeh, Syed Mahmud, Wayne State University, United States; Ala Khalifeh, German Jordanian University, Jordan

3 Fuzzy Logic-based Broadcast in Vehicular Ad hocNetworks
Elnaz Limouchi, Imad Mahgoub, Ahmad Alwakeel, Florida Atlantic University, United States

4 Performance Analysis of the Functional Interaction of Awareness Control and DCC in VANETs
Torsten Lorenzen, Leibniz Universität Hannover, Germany

5 Throughput and Cost-Effectiveness of Vehicular Mesh Networks for Internet Access
Alexandre Ligo, Jon Peha, Carnegie Mellon University, United States; João Barros, University of Porto, Portugal

Wednesday, 21 September 2016 11:00-12:30 Fontaine G
7G: Vehicular Electronics and Machines
Chair: Hesham El-Sayed, United Arab Emirates University, United Arab Emirates

1 A Lithium-Ion Battery Electro-Thermal Model of Parallellized Cells
Felix-A. LeBel, Université de Sherbrooke, Canada; Stephen Wilke, Ben Schweitzer, Allcell Technologies, United States; Marc-André Roux, CTA, Canada; Said Al-Hallaj, Allcell Technologies, United States; Joao Pedro Trovao, Université de Sherbrooke, Canada

2 Multipolar High-Speed IPMSM Design for EV Traction Considering Mechanical Stress
Kyong-Soo Cha, Dong-Min Kim, Min-Ro Park, Myung-Hwan Yoon, Jung-Pyo Hong, Hanyang University, South Korea

3 Rare-Earth-Free Electric Motor Design for EV Traction Comparing Overall Vehicle Efficiency Considering Driving Cycle
Dong-Min Kim, Kyoung-Soo Cha, Myung-Seop Lim, Jung-Pyo Hong, Hanyang University, South Korea

4 Realization of a Distribution-Service System Using Multirotor Unmanned Aerial Vehicles
Kenichi Mase, Niigata University, Japan

5 Design and Characterization of a 77 GHz Six-port Modulator for an Automobile Radar
Homa Arab Salmanabadi, Serioja Tatu, INRS, Canada; Cevdet Akyel, Ecole polytechnique, Montreal, Canada

Wednesday, 21 September 2016 11:00-12:30 Fontaine H
7H: Cellular Networks
Chair: Mamoru Sawahashi, Tokyo City University, Japan

1 A Simple Transmission Scheme for Coordinated Multipoint Uplink Transmission with Limited Fronthaul
Jiyang Bai, Qingpeng Liang, Chuan Huang, Shihai Shao, Youxi Tang, University of Electronic Science and Technology of China, China

2 BER Analysis of FBMC Based Multi-Cellular Networks in the Presence of Synchronisation Errors and HPA NLD
Brahim Elmaroud, My Ahmed Faqihi, Mohammed Abbad, Driss Aboutajdine, Mohammed V University in Rabat, Morocco

3 A Novel QAM-FBMC without Intrinsic Time-Domain Interference
Jinchao Wang, Yuyan Zhang, Hui Zhao, Lin Li, Hang Long, Hengyang Shen, Beijing University of Posts and Telecommunications, China

4 On the Number and 3D Placement of Drone Base Stations in Wireless Cellular Networks
Elham Kalantari, University of Ottawa, Canada; Halim Yanikomeroglu, Carleton University, Canada; Abbas Yongacoglu, University of Ottawa, Canada

5 Time Pattern Based Flow Control in SDN Networks
Murong Lin, Nokia, United States; Yinghua Ye, Nokia, United States

Wednesday, 21 September 2016 11:00-12:30 Fundy
7I: Positioning in Transportation
Chair: Zahra Madadi, Nanyang Technological University, Singapore

1 Cooperative Infrastructure-based Vehicle Positioning
Fabian de Ponte Müller, Estefania Munoz Diaz, Ibrahim Rashdan, German Aerospace Center DLR, Germany

2 Improved SMC-PHD Filter for Multi-target Track-Before-Detect
Xin Luo, Chaoqun Yang, Ruiyong Chen, Zhiguo Shi, Zhejiang University, China

3 Robust Misalignment Handling in Pedestrian Dead Reckoning
Jayaprasad Bojja, Jussi Parviainen, Jussi Collin, Tampere University of Technology, Finland; Riku Hellevaara, Jani Käppi, Kimmo Alanen, Microsoft Corporation, Finland; Jarmo Takala, Tampere University of Technology, Finland

4 Terrain Based GPS Independent Lane-Level Vehicle Localization using Particle Filter and Dead Reckoning
Hamad Ahmed, Muhammad Tahir, Lahore University of Management Sciences, Pakistan; Khurram Ali, COMSATS Institute of Information Technology, Pakistan

5 Highly Accurate Distance Estimation Using Spatial Filtering and GNSS in Urban Environments
Ahmad El Assaad, Novero GmbH, Germany; Markus Krug, Munich University of Applied Sciences, Germany; Georg Fischer, University of Erlangen-Nuremberg, Germany

Wednesday, 21 September 2016 11:00-12:30 Fontaine A and B
7P: Multiple Antenna Systems and Cooperative Communications Posters
Chair: Wessam Ajib, Universite du Quebec a Montreal, Canada

1 3D MIMO Channel Characteristics and Capacity Evaluation for Different Dynamic Ranges in Outdoor-to-Indoor Scenario for 6 GHz
Yuxiang Zhang, Lei Tian, Yawei Yu, Qingfang Zheng, Jianhua Zhang, Beijing University of Posts and Telecommunications, China; Yu Zhang, Qualcomm Inc., China

2 Experimental Evaluation of DCOOP Protocol using USRP-RIO based testbed at 5.8GHz
Nasir Hussain, Karla Ziri-Castro, Dhammika Jayalath, Queensland University of Technology, Australia; Mohammed Arafah, King Saud University, Saudi Arabia

3 On the Evaluation of Clipping Effects in Massive MIMO-OFDM Systems
Joao Guerreiro, Rui Dinis, Instituto de Telecomunicacoes, FCT-UNL, Portugal; Paulo Montezuma, Uninova, FCT-UNL, Portugal

4 A Network-Centric View on DASH in Wireless Multihop Networks
Mousie Fasil, Hussein Al-Shatri, Stefan Wilk, Anja Klein, Technical University Darmstadt, Germany

5 Opportunistic Scheduling Algorithm for Joint-Processing DL CoMP
Thierry Clessienne, Orange Labs, France

6 Achievable Degrees of Freedom of the K-user MISOBroadcast Channel with Alternating CSIT via Interference Creation-Resurrection
Mohamed Seif, Nile University, Egypt; Amr El-Keyi, Carleton University, Canada; Mohammed Nafie, Nile University, Egypt

8A: Massive MIMO II
Chair: Walaa Hamouda, Concordia University, Canada

1 Investigation of Massive MIMO in Dense Small Cell Deployment for 5G
Xiaolin Hou, Xin Wang, Huiling Jiang, Hidetoshi Kayama, DOCOMO Beijing Communications Laboratories Co., Ltd., China

2 L1/2-Regularization Based Antenna Selection for RF-Chain Limited Massive MIMO Systems
Shichao Qin, Xi'an Jiaotong University, China; Guobing Li, Xi'an Jiaotong University, China; Gangming Lv, Xi'an Jiaotong University, China; Guomei Zhang, Xi'an Jiaotong University, China; Hui Hui, Xi'an University of Technology, China

3 Energy Efficient Joint User Association and Power Allocation Design in Massive MIMO Empowered Dense HetNets
Yan Lin, Yi Wang, Chunguo Li, Yongming Huang, Luxi Yang, Southeast University, China

4 On the Downlink Performance of Massive MIMO With Finite Antenna Elements in Multi-Cellular Networks
Li-Chun Wang, Youyi Lu, National Chiao Tung University, Taiwan

5 On the Precoding for Multi-Cell Massive MIMO Systems with Distributed Antenna Subarrays
Takeaki Nishiuchi, Osaka Prefecture University, Japan; Hai Lin, Osaka Prefecture University, Japan; Katsumi Yamashita, Osaka Prefecture University, Japan; Jingxian Wu, University of Arkansas, United States

8B: Beamforming II
Chair: Rose Qingyang Hu, Utah State University, USA

1 Location Based Beamforming in 5G Ultra-Dense Networks
Petteri Kela, Mário Costa, Huawei Technologies Oy (Finland). Co. Ltd., Finland; Jussi Turkka, Magister Solutions Ltd., Finland; Mike Koivisto, Janis Werner, Aki Hakkarainen, Mikko Valkama, Tampere University of Technology, Finland; Riku Jäntti, Aalto University, Finland

2 Optimizing Random Unitary Beamforming for Energy Efficiency in MIMO Broadcast Channels
Jae-Hong Kwon, Korea University, South Korea; Young-Chai Ko, Korea University, South Korea; Hong-Chuan Yang, University of Victoria, Canada

3 Transmit Beamforming Optimization for Wireless Information and Power Transfer in MISO Interference Channels with Signal Cooperation
Hoon Lee, Korea University, South Korea; Sang-Rim Lee, LG Electronics, South Korea; Kyoung-Jae Lee, Hanbat National University, South Korea; Han-Bae Kong, Nanyang Technological University, Singapore; Inkyu Lee, Korea University, South Korea

4 Effective Beam Alignment Algorithm for Low Cost Millimeter Wave Communication
Tobias Kadur, Hsiao-Lan Chiang, Gerhard Fettweis, Technische Universität Dresden, Germany

5 Performance Analysis of Beam Sweeping in Millimeter Wave Assuming Noise and Imperfect Antenna Patterns
Vutha Va, Robert W. Heath Jr., The University of Texas at Austin, United States

8C: Spectrum Management II
Chair: Dusit Niyato, Nanyang Technological University, Singapore

1 Price Competition in Spectrum Markets: How Accurate is the Continuous Prices Approximation?
Aditya MVS, Abhishek Raghuvanshi, Gaurav Kasbekar, Indian Institute of Technology Bombay, India

2 Performance Analysis of Interweave CognitiveRadio Systems with Imperfect Channel Knowledgeover Nakagami Fading Channels
Ankit Kaushik, Karlsruhe Institute of Technology (KIT), Germany; Shree Krishna Sharma, Symeon Chatzinotas, Bjorn Ottersten, Friedrich Jondral, SnT, University of Luxembourg, Luxembourg

3 Performance of Enhanced Dynamic Frequency Hopping in IEEE 802.22 with MIMO Implementation
Walaa Hamouda, Aikaterini Dimogiorgi, Concordia University, Canada

4 Optimization of Effective Area Spectral Efficiency for Wireless Communications Systems UnderNakagami-m Fading Channels
Aymen Omri, Mazen O. Hasna, Qatar University, Qatar

5 Partial Variable-Gain AF Relay Selection with Outdated Channel Estimates in Spectrum-Sharing Networks
Jules M. Moualeu, University of the Witwatersrand, South Africa; Walaa Hamouda, Concordia University, Canada; Fambirai Takawira, University of the Witwatersrand, South Africa

8D: Heterogeneous Networks II
Chair: Gerhard Bauch, Technische Universität Hamburg-Harburg, Germany

1 Performance Evaluation of MISO-SDMA in Heterogenous Networks with Practical Cell Association
Mohammad Ghadir Khoshkholgh, The University of British Columbia, Canada; Keivan Navaie, Lancaster University, United Kingdom; Victor C. M. Leung, The University of British Columbia, Canada; Kang G. Shin, The University of Michigan, United States

2 Quantifying the Regularity of Perturbed Triangular Lattices using CoV-Based Metrics for Modeling the Locations of Base Stations in HetNets
Faraj Lagum, Sebastian Szyszkowicz, Halim Yanikomeroglu, Carleton University, Canada

3 Disaster Management and Response for Modern Cellular Networks using Flow-based Multi-hop Device-to-Device Communications
Maryam Tanha, Dawood Sajjadi, Fei Tong, Jianping Pan, University of Victoria, Canada

4 Resource Allocation for Wireless Information and Energy Transfer in Macrocell-Small Cell Networks
Sudha Lohani, University of British Columbia, Canada; Ekram Hossain, University of Manitoba, Canada; Vijay Bhargava, University of British Columbia, Canada

5 Optimal Approach to Provide Electric Vehicles with Charging Service by Using Mobile ChargingStations in Heterogeneous Networks
Huwei Chen, Zhou Su, Yilong Hui, Hui Hui, Shanghai University, China

8E: M2M
Chair: Waleed Ejaz, Ryerson University, Canada

1 Exploiting Spatial and Temporal Correlations for Signal-Centric MAC in M2M Communications
Rung-Hung Gau, National Chiao Tung University, Taiwan; Fu-Ta Kuo, National Chiao Tung University, Taiwan

2 A Software Defined Radio Based IEEE 802.15.4k Testbed for M2M Applications
Rongtao Xu, Lei Lei, Beijing Jiaotong University, China; Xiong Xiong, Kan Zheng, Hengyang Shen, Beijing University of Posts and Telecommunications, China

3 Towards an M2M overlay network on PRACH in LTE/LTE-A
Jelena Misic, Vojislav B. Misic, Ryerson University, Canada

4 Uplink Cooperative Transmission For Machine-Type Communication Traffic in Cellular System
Yue Li, Mohammad Ghasemiahmadi, Lin Cai, University of Victoria, Canada

5 Resource Allocation for Massive M2M Communications in SCMA Network
Tao Xue, Lin Qiu, Xin Min Li, University of Science and Technology of China, China

Wednesday, 21 September 2016 14:00-15:30 Fontaine F
8F: LTE II
Chair: Chuan Huang, UESTC, China

1 Resource Allocation in LTE-based MIMO Systems with Carrier Aggregation
Soheil Rostami, University of Greenwich, United Kingdom; Kamran Arshad, Ajman University of Science & Technology, United Arab Emirates; Predrag Rapajic, University of Greenwich, United Kingdom

2 Real Life LTE In-building Deployment Demonstrating Multi-cell Capacity
Tomas Jönsson, Ericsson, Sweden; Chris Nizman, Maurice Bergeron, Ericsson, Canada; Kjell Larsson, Arne Simonsson, Ericsson, Sweden

3 TCP performance for practical implementation of very tight coupling between LTE and WiFi
Younes Khadraoui, Xavier Lagrange, Annie Gravey, Institut Mines Telecom-IRISA D2, France

4 Automatic Detection of SIP-aware Attacks on VoLTE Device
Shen Zhang, Lu Zhou, MingLi Wu, Zhushou Tang, Na Ruan, Haojin Zhu, Shanghai Jiao Tong University, China

5 Universal Time-domain Windowed OFDM
Keiichi Mizutani, Hiroshi Harada, Kyoto University, Japan

Wednesday, 21 September 2016 14:00-15:30 Fontaine G
8G: Vehicle Sensing and Perception
Chair: Loic Boulon, University du Québec à Trois-Rivières, Canada

1 Urban Area Congestion Detection and Propagation Using Histogram Model
Hesham El-Sayed, United Arab Emirates University, United Arab Emirates

2 A Faster RCNN-based Pedestrian Detection System
Xiaotong Zhao, Beijing University of Posts and Telecommunications, China; Wei Li, University of Victoria, China; Yifang Zhang, Beijing University of Posts and Telecommunications, China; Aaron Gulliver, University of Victoria, Canada; Shuo Chang, Zhiyong Feng, Beijing University of Posts and Telecommunications, China

3 Monocular Fisheye Lens Model-Based Distance Estimation for Forward Collision Warning Systems
Seokmok Park, Chung-Ang University, Korea, Republic of

4 Improving Vehicular Traffic Simulations Using Real-Time Information on Environmental Conditions
Lars Habel, Universität Duisburg-Essen, Germany; Christoph Ide, Christian Wietfeld, Technische Universität Dortmund, Germany; Michael Schreckenberg, Universität Duisburg-Essen, Germany

5 Analysis of Communication Requirements for CACC in Stop-and-Go Behavior for Energy Efficient Driving
Ibrahim Rashdan, Germany; Fabian de Ponte Müller, Stephan Sand, German Aerospace Center (DLR), Germany

Wednesday, 21 September 2016 14:00-15:30 Fontaine H
8H: Resource Allocation III
Chair: Liping Qian, Zhejiang University of Technology

1 A SMDP Based Virtual Resource Allocation Model for Multimedia Services in 5G Network
Hongbin Liang, Lei Zheng, Southwest Jiaotong University, China; Wei Li, University of Victoria, Canada; Qingchun Chen, Southwest Jiaotong University, China

2 Load-based Resource Allocation and Interference Coordination for Multi-carrier Dense Networks
Zhiyi Zhou, Hao Ge, Northwestern University, United States; Jialing Liu, Weimin Xiao, Huawei, United States

3 Cost-Efficient Codebook Assignment and Power Allocation for Energy Efficiency Maximization in SCMA Networks
Yuzhou Li, Huazhong University of Science and Technology, China; Min Sheng, Zhisheng Sun, Yuhua Sun, Lei Liu, Daosen Zhai, Jiandong Li, Xidian University, China

4 Online Power Allocation for Opportunistic Radio Access in Dynamic OFDM Networks
Alexandre Marcastel, E. Veronica Belmega, Univ. de Cergy Pontoise, France; Panayotis Mertikopoulos, INRIA/Centre National de la Recherche Scientifique (CNRS) and the Laboratoire d'Informatique de Grenoble, France; Inbar Fijalkow, Univ. de Cergy Pontoise, France

5 Scheduling Energy Harvesting Roadside Units inVehicular Ad hoc Networks
Wassim Sellil Atoui, Mohammad Ali Salahuddin, Wessam Ajib, Mounir Boukadoum, Université du Québec à Montréal, Canada

Wednesday, 21 September 2016 14:00-15:30 Fundy
8I: Localization in Ad Hoc Networks
Chair: Alfonso Bahillo Martinez, University of Deusto, Spain

1 A study of the ranging error for Parallel DoubleSided-Two Way Ranging protocol
Réjane Dalcé, Adrien van den Bossche, Thierry Val, IRIT, Université de Toulouse, France

2 A Waveform Matching Based Data-processing Method for TOF Ranging
Ruomin Ba, Shanghai Kuo Xin, Tao Liu, Shanghai JiaoTong University, China

3 Localization for Mobile Sensor Networks in Mines
Frank Levstek, Muhammad Jaseemuddin, Xavier Fernando, Ryerson University, Canada

4 Receiver Tracking using Signals of Opportunity from Asynchronous RF Beacons in GNSS-denied Environments
Zahra Madadi, Nanyang Technological University, Singapore; Francois Quitin, Universit´e libre de Bruxelles, Belgium; Wee Peng Tay, Nanyang Technological University, Singapore

5 Virtual multi-antenna array for estimating the angle-of-arrival of a RF transmitter
Francois Quitin, Université libre de Bruxelles (ULB), Belgium; Vivek Govindaraj, University College Dublin, Ireland; Xionghu Zhong, Wee Peng Tay, Nanyang Technological University, Singapore

Wednesday, 21 September 2016 14:00-15:30 Fontaine A and B
8P: Radio Access Posters
Chair: Xiaohua Tian, Shanghai Jiao Tong University, China

1 A Transforming Architecture for Future Wireless Networks: Transformium Network
Letian Li, Haichao Wei, Na Deng, Bin Fang, Wuyang Zhou, University of Science and Technology of China (USTC), China

2 Deploying Multiple Antennas on High-speed Trains: Equidistant Strategy v.s. Fixed-Interval Strategy
Yang Lu, Ke Xiong, Beijing Jiaotong University, China; Pingyi Fan, Tsinghua University, China; Yu Zhang, University of ScienceTechnology Beijing, China; Zhangdui Zhong, Beijing Jiaotong University, China

3 Flexible Carrier Utilization in Dense Stadium
Kewen Yang, Zezhou Luo, Hongcheng Zhuang, Jietao Zhang, Quanzhong Gao, Huawei Technologies Co., Ltd., China

4 Multichannel Design of Non uniform Constellations for Broadcast/Multicast Services
Belkacem Mouhouche, Mohammed Al-Imari, Daniel Ansorregui, Samsung Electronics UK, United Kingdom

5 Statistical Covariance Based Signal Detection for Ambient Backscatter Communication Systems
Tengchan Zeng, Gongpu Wang, Beijing Jiaotong University, China; Yanwen Wang, ZTE Corporation, China; Zhangdui Zhong, Beijing Jiaotong University, China; Chintha Tellambura, University of Alberta, Canada

6 Impact of Correlated Group Mobility Modelling in the Context of Realistic Mobile Network Simulation Scenarios
Sören Hahn, Dennis Martin Rose, Christoph Herold, Thomas Kürner, TU Braunschweig, Germany

7 Traffic profile based clustering for dynamic TDD in dense mobile networks
Paolo Baracca, Nokia Bell Labs, Germany

Wednesday, 21 September 2016 16:00-17:30 La Salle
9A: 5G III
Chair: Ning Zhang, University of Waterloo, Canada

1 Asynchronous Scrambled Coded Multiple Access (A-SCMA) - A New High Efficiency Random Access Method
Neal Becker, Mustafa Eroz, Stan Kay, Lin-nan Lee, Hughes Network Systems, United States

2 Enabling RAN Moderation and Dynamic Traffic Steering in 5G
Athul Prasad, NOKIA Bell Labs, Finland; Fernando Sanchez Moya, NOKIA Bell Labs, Poland; Mårten Ericson, Ericsson Research, Sweden; Roberto Fantini, Telecom Italia, Italy; Ömer Bulakci, Huawei ERC, Germany

3 Fog RAN over General Purpose Processor Platform
Yu-Jen Ku, Dian-Yu Lin, Hung-Yu Wei, National Taiwan University, Taiwan

4 Wireless Backhaul Capacity of 5G Ultra-Dense Cellular Networks
Xiaohu Ge, Linghui Pan, Song Tu, Huazhong University of ScienceTechnology, China; Hsiao-Hwa Chen, National Cheng Kung University, Taiwan; Cheng-Xiang Wang, Heriot-Watt University, United Kingdom

5 Towards a Low-Delay Edge Cloud Computing Through a Combined Communication and Computation Approach
Tiago Gama Rodrigues, Katsuya Suto, Hiroki Nishiyama, Nei Kato, Tohoku University, Japan; Kimihiro Mizutani, Takeru Inoue, Osamu Akashi, NTT, Japan

Wednesday, 21 September 2016 16:00-17:30 Loungueuil
9B: Cooperative Communication III
Chair: Dusit Niyato, Nanyang Technological University, Singapore

1 A Weighted Combining Algorithm for Spatial Multiplexing MIMO DF Relaying Systems
Kangli Zhang, Jian Wang, National University of Defence Technology, China; Jiaxin Yang, Benoit Champagne, McGill University, Canada; Jibo Wei, National University of Defence Technology, China

2 Finite-SNR DMT Analysis for Multisource Multirelay NCC Systems with Imperfect CSI
Ali Reza Heidarpour, Ozyegin University, Turkey; Gunes Karabulut Kurt, Istanbul Technical University, Turkey; Murat Uysal, Ozyegin University, Turkey

3 Multi-layer Network Coding for Multiuser Relay Networks With Non-Uniform-Rate Users
Chunling Peng, Fangwei Li, Chongqing University of Posts & Telecommunications, Chongqing, China; Huaping Liu, Oregon State University, United States

4 Optimum HDAF Relay-Assisted Combining Scheme with Relay Decision Information
Rawan Alkurd, Carleton University, Canada; Ibrahim Abualhaol, toCognition Incorporation, Canada; Raed M. Shubair, Khalifa University, United Arab Emirates; Muriel Medard, MIT, United States

5 Spectral Efficiency Analysis of Incremental Amplify-and-Forward Opportunistic Relaying with Outdated CSI
Tsingsong Zhou, Qiang Gao, Beihang University, China; Li Fei, Wuhan Maritime Communication Research Institute, China

Wednesday, 21 September 2016 16:00-17:30 Fontaine C
9C: Wideband Sensing
Chair: Chuan Huang, UESTC, China

1 Multi-band Cooperative Spectrum Sensing in RF Powered Cognitive Radio Networks
Mehak Basharat, Waleed Ejaz, Kaamran Raahemifar, Alagan Anpalagan, Ryerson University, Canada

2 On Reducing Multiband Spectrum Sensing Durationfor Cognitive Radio Networks
Morteza Soltani, Tuncer Baykas, Huseyin Arslan, Istanbul Medipol University, Turkey

3 Square Law Selection Diversity for Wideband Spectrum Sensing Under Fading
Kamal Captain, Manjunath Joshi, Dhirubhai Ambani Institute of Information and Communication Technology, India

4 Square-Law Selector and Square-Law Combiner forCognitive Radio Systems: An Experimental Study
Lucas Rodés, Ankit Kaushik, Karlsruhe Institute of Technology (KIT), Germany; Shree Krishna Sharma, Symeon Chatzinotas, University of Luxembourg, Luxembourg; Friedrich Jondral, Karlsruhe Institute of Technology (KIT), Germany

5 Two-Phase Concurrent Sensing and TransmissionScheme for Full Duplex Cognitive Radio
Shree Krishna Sharma, University of Luxembourg, Luxembourg; Tadilo Endeshaw Bogale, Long Bao Le, INRS, Universite du Quebec, Canada; Symeon Chatzinotas, University of Luxembourg, Luxembourg; Xianbin Wang, University of Western Ontario, Canada; Bjorn Ottersten, University of Luxembourg, Luxembourg

Wednesday, 21 September 2016 16:00-17:30 Fontaine D
9D: MIMO II
Chair: Georges Kaddoum, ETS, Canada

1 Precoding Designs in Non-Regenerative MIMO Two-Way Relay Systems for Maximizing Weighted Sum Energy Efficiencies
Zhi Wang, Lihua Li, BUPT, China; Xingwang Li, Henan Polytechnic University, China; Huizhong Wang, Hui Tian, BUPT, China

2 Enhanced CSI Feedback for FD-MIMO with Beamformed CSI-RS in LTE-A Pro Systems
Gregory Morozov, Alexei Davydov, Victor Sergeev, Intel, Russian Federation

3 Low Complexity Precoder Selection for FD-MIMO Systems
Federico Penna, Hongbing Cheng, Jungwon Lee, Samsung Semiconductor, Inc., United States

4 MIMO Channel Dimension Estimation in Interference Channels with Antenna Disparity
Chris Waters, University of Bristol, United Kingdom

5 Multicarrier Air to Ground MIMO Communication System Performance
Hosseinali Jamal, David Matolak, University of South Carolina, United States

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9E: 3D and Spatial Channel Modeling
Chair: Matthias Uwe Pätzold, University of Agder, Norway

1 An Extension of Spatial Channel Model with Spatial Consistency
Yi Wang, Zhenyu Shi, Lei Huang, Ziming Yu, Chang Cao, Huawei Technologies Co., Ltd,, China

2 Gaussian Modeling of Spatially Correlated LOS/NLOS Maps for Mobile Communications
Stefan Schwarz, Illia Safiulin, TU Wien, Austria; Tal Philosof, Wireless Enables Lab General-Motors, Israel; Markus Rupp, TU Wien, Austria

3 Geometry-Based Stochastic Modeling for Non-Stationary High-Speed Train MIMO Channels
Junhui Zhao, Beijing Jiaotong University, China; Shangyao Wang, Beijing Jiaotong University, China; Xu Liu, Beijing Jiaotong University, China; Yi Gong, South University of Science and Technology of China, China

4 Fast 3D Ray Tracing for Indoor Coverage Solutions
Ahmed Abdel-Gawwad, Mohamed Ashour, Tallal Elshabrawy, Hany Hammad, The German University in Cairo, Egypt

5 The Urban Hannover Scenario ? Realistic 3D Pathloss Predictions and Mobility Patterns
Dennis M. Rose, Thomas Jansen, Technische Universität Braunschweig, Germany; Thomas Werthmann, University of Stuttgart, Germany; Ulrich Türke, atesio GmbH, Germany; Thomas Kürner, Technische Universität Braunschweig, Germany

9F: Physical Layer Security
Chair: Long Le, INRS, University of Quebec, Canada

1 Controlled Inter-carrier Interference for Physical Layer Security in OFDM Systems
Marwan Yusuf, Huseyin Arslan, Istanbul Medipol University, Turkey

2 Improving Physical Layer Security of AF Relay Systems with Beam-forming and Jamming
Abdelhamid Salem, Khairi A. Hamdi, University of Manchester, United Kingdom

3 On the Security of Millimeter Wave Vehicular Communication Systems using Random Antenna Subsets
Mohammed Eltayeb, Junil Choi, The University of Texas at Austin, United States; Tareq Al-Naffouri, King Abdullah University of Science and Technology, Saudi Arabia; Robert Heath, The University of Texas at Austin, United States

4 Secure D2D Communication Underlying Cellular Networks: Artificial Noise Assisted
Xiaolei Kang, Xinsheng Ji, Kaizhi Huang, Zhou Zhong, NDSC, China

5 Security Performance Analysis of SIMO Generalized-K Fading Channels Using a Mixture Gamma Distribution
Hongjiang Lei, Chongqing University of PostsTelecommunications, China; Imran Ansari, Texas A&M University at Qatar, Qatar; Huan Zhang, Chongqing University of PostsTelecommunications, China; Khalid Qaraqe, Texas A&M University at Qatar, Qatar; Gaofeng Pan, Southwest University, China

9G: Vehicle Control for Traffic Safety
Chair: Kenichi Mase, Niigata University, Japan

1 A Solution To The Congestion Problem: Profiles Driven Trip Planning
Haitham Amar, Otman Basir, University of Waterloo, Canada

2 pSafety: A Collision Prevention System for Pedestrians Using Smartphone
Chi-Han Lin, Yi-Ting Chen, Jyun-Jie Chen, National Tsing Hua University, Taiwan; Wen-Chan Shih, Wen-Tsuen Chen, Academia Sinica, Taiwan

3 Robust and Efficient Tracking with Large Lens Distortion for Vehicular Technology Applications
Che-Tsung Lin, Long-Tai Chen, Pai-Wei Cheng, Industrial Technology Research Institute, Taiwan; Yuan-Fang Wang, University of California, Santa Barbara, United States

4 A Forward Collision Probability Index Based on the Driving Behavior
Yuan-Lin Chen, Ming Chi University of Technology, Taiwan

5 IVO Robot Driver
Oded Yechiel, Hugo Guterman, Ben-Gurion University of the Negev, Israel

9H: Vehicular Networks - Applications
Chair: Antnonio Loureiro, Federal University of Minas Gerais, Brazil

1 A Complete Observation Model for Tracking Vehicles from Mobile Phone Signal Strengths and its Potential in Travel-time Estimation
Charith Chitraranjan, University of Moratuwa, Sri Lanka; Anne Denton, North Dakota State University, United States; Amal Perera, University of Moratuwa, Sri Lanka

2 Characterization of Intersection Topologies in Urban Areas for Vehicle-to-Vehicle Communication
Hugues Narcisse Tchouankem, Leibniz Universität Hannover, Germany

3 Exploiting Taxi Demand Hotspots Based on Vehicular Big Data Analytics
Lu Zhang, Cailian Chen, Yiyin Wang, Xinping Guan, Shanghai Jiao Tong University, China

4 STRIP: A Short-term Traffic Jam Prediction based on Logistic Regression
Antonio Loureiro, Thiago Silva, Renato Assunção, UFMG, Brazil; Fatima Duarte-Figueiredo, PUC-MINAS, Brazil; Anna Izabel Tostes, UFMG, Brazil

5 Lane-level Vehicular Localization Utilizing Smartphones
Siyu Zhu, Shanghai Jiao Tong University, China; Xiong Wang, Shanghai Jiao Tong University, China; Zhehui Zhang, Shanghai Jiao Tong University, China; Xiaohua Tian, Shanghai Jiao Tong University, China; Xinbing Wang, Shanghai Jiao Tong University, China

9I: Indoor Localization and Tracking
Chair: Francois Quitin, Université libre de Bruxelles, Belgium

1 A Soft-minimum Method for NLOS Error Mitigation in TOA Systems
Zhenqiang Su, Oregon State University, United States; Genfu Shao, Hangzhou Dianzi University, China; Huaping Liu, Oregon State University, United States

2 Asynchronous Tracking System Based on Multi-path Profile Fingerprinting and Particle Filter
Genming Ding, Pei Chen, Jun Tian, Qian Zhao, Fujitsu R&D Center Co., LTD., China

3 Indoor Positioning and Tracking Using Particle Filters with Suboptimal Importance Density
Yueyue Zhang, Yaping Zhu, Feng Yan, Lianfeng Shen, Tiecheng Song, Southeast University, China

4 Non-cooperative Wi-Fi Localization via Monitoring Probe Request Frames
Hao Chen, Yifan Zhang, Beijing University of Posts and Teleocm, China; Wei Li, University of Victoria, Canada; Ping Zhang, Beijing University of Posts and Teleocm, China

5 Synchronization-Free Model with Signal Repeater for Timing-Based Localization
Zhenqiang Su, Oregon State University, United States; Genfu Shao, Hangzhou Dianzi University, China; Huaping Liu, Oregon State University, United States