2015 IEEE International Conference on Ubiquitous Wireless Broadband

Montreal.2015 Oct.4-7

Conference Proceedings

IEEE Catalog Number: CFP15UWS-ART
ISBN: 978-1-4673-6555-0

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A WINNING FORMULA

PERSWADE is proud of hosting, reshaping, organizing, and presenting to you the 15th Montreal edition of IEEE ICUWB under a novel format that translates its core spirit and vision about interdisciplinary and transversal research on wireless techs & apps. It values your contribution and participation to the success of this turning-point edition, and wishes renewed ICUWB greater successes thanks to your continuous and precious support.

To learn more about PERSWADE, the NSERC CREATE Research Training Program on Pervasive and Smart Wireless Applications for the Digital Economy, please visit: **WWW.CREATE-PERSWADE.CA**

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IEEE Catalog Number:	CFP15UWS-ART (Article)
	CFP15UWS-USB (USB)
ISBN:	978-1-4673-6555-0 (Article)
	978-1-4673-6554-3 (USB)

Printed copies of this publication are available from:
Curran Associates, Inc. 57 Morehouse Lane, Red Hook, NY 12571 USA
Phone: (845) 758-0400 / Fax: (845) 758-2633
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MESSAGE FROM THE GENERAL CHAIRS

INTERNATIONAL CONFERENCE ON UBIQUITOUS WIRELESSS BROADBAND

Wireless Highways to the Digital Economies & Smart Societies

MONTREAL, OCTOBER 4-7, 2015

Welcome to the new IEEE ICUWB! ... now the International Conference on **Ubiquitous Wireless Broadband** ...

From its previous focus on ultra-wideband (UWB) technologies, ICUWB is evolving this year into a new forum for the latest original research achievements and developments in ultra-high frequency wireless broadband technologies and their ubiquitous fields of application in microwave, millimeter wave, and even Terahertz, lightwave and optical wireless (OW) bands.

On the top of a rich variety of regular technical sessions, our conference program will include plenary sessions and panel discussions featuring world-class innovators both in wireless broadband technologies and its ubiquitous applications, invited special sessions covering the most disruptive topics under the conference theme Wireless Highways to the Digital Economies and Smart Societies, as well as an exciting welcome reception meant to offer to attendees an unforgettable taste of Montreal's distinctive creativeness in blending arts and technology.

On behalf of the whole Organizing Committee, we wish you an excellent meeting and a great stay in Montreal.

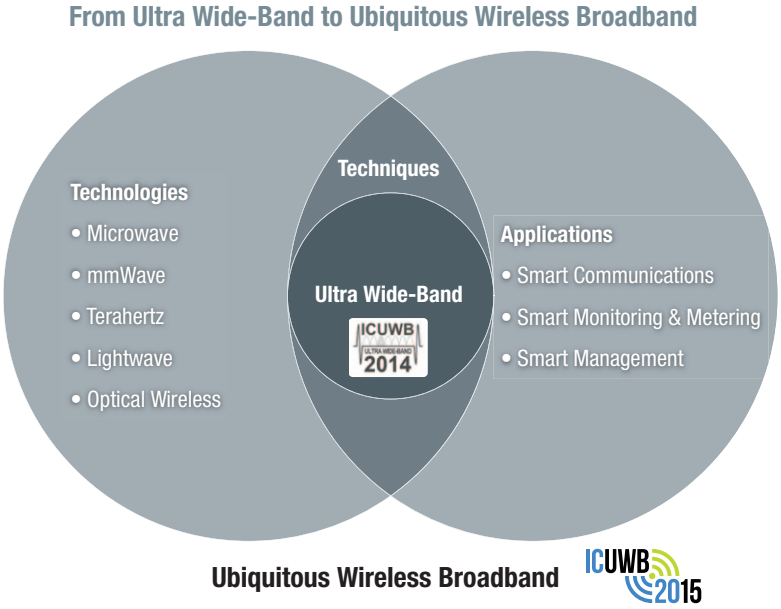
Sofiène Affes, Professor, INRS-EMT
affes@emt.inrs.ca / 514 228-7011

Charles Despins, CEO, Prompt Inc.
cdespins@promptinc.org / 514 875-0032

ABOUT THE CONFERENCE

ICUWB is meant to become a world-class annual rendezvous for research & innovation in wireless broadband and its ubiquitous applications.

The 15th edition of the IEEE International Conference on Ubiquitous Wireless Broadband ICUWB'2015 (formerly known as International Conference on Ultra Wide-Band) was held in Montreal, Canada, from October 4th to 7th, 2015, under the theme Wireless Highways to the Digital Economies & Smart Societies. October is the perfect time to host an event in Montreal; a vibrant multicultural, multilingual and welcoming city that offers visitors a unique and well-blended taste of Europe in North America.



ICUWB, under its new format, shall provide a new forum for the latest original research achievements and developments in ultra-high frequency wireless broadband technologies and their ubiquitous fields of application in microwave, millimeter wave, and even Terahertz, lightwave and optical wireless (OW) bands; without any restriction in scope to the standardized radio interface technologies commonly called today as UWB. In this turning-point edition, topics of interest included, but were not limited to the list below:

Technologies & Techniques

Antennas & Propagation
- Microwave, mmWave, Terahertz, OW & lightwave antennas/devices
- Channel measurements & modeling

Communication Systems & Signal Processing
- Modulation, detection & coding
- Synchronization, equalization & time reversal
- Ranging, localization & positioning
- Multiple access schemes & radio access technologies
- Antenna-array beamforming & MIMO systems
- Massive MIMO
- Interference mitigation techniques
- Access protocols & architectures

Hardware Architectures & Implementation
- RF modules, circuits & systems
- Pulse generation & detection
- Integrated circuits design
- Radio interface architectures
- Low-power consumption techniques
- Energy-harvesting implementations

Cognitive Radio & Cooperative Systems
- Cognitive wireless networks
- Spectrum sensing & dynamic spectrum access
- Underlay/overlay systems
- Energy-efficient cross-layer design
- Cooperative & relayed communications

Standardization & Regulatory Issues
- Spectral management
- 5G & emerging wireless standards
- Measurements for type approval
- Co-existence

Applications

New Communication Paradigms
- 5G communications
- Wireless cloud & access virtualization
- Green communications
- Device to device communications
- (D2D)
- Machine to machine communications (M2M)
- Vehicle to vehicle communications (V2V), Connected Vehicle (CV)
- Internet of things (IoT)
- Communications over power lines
- Nano-communication devices, systems & networks
- Underwater acoustic (UWA) communications

Smart Monitoring & Metering
- Sensor/ RF identification (RFID) systems & networks
- Remote sensing, geosensing, geomatics, etc.
- Wireless personal/body area networks (WPAN/WBAN)
- Collision, ground-penetrating & through-the-wall radars
- Materials & manufacturing defects detection & characterization
- Healthcare & medical imaging
- Disaster early warning systems
- Surveillance, safety & security (e.g., traffic, mining, etc.)
- Environment, natural resources & infrastructures

Smart Management Systems
- Smart homes, cars, offices, hospitals, schools, cities, etc.
- Intelligent transportation systems (ITS), traffic fluidity
- Smart grids & renewable energies
- Sustainable economic, social & urban development
- Production, distribution & services

PROGRAM AT A GLANCE

DAY 1, SUNDAY OCTOBER 4TH, 2015

FEATURED THEME OF THE DAY: WIRELESS FOR TRANSPORTATION AND MICROELCTRONICS

	REGISTRATION DESK	SALON DES SAISONS A	SALON PRINTEMPS	SALON DES SAISONS B	SALON ÉTÉ	FOYER AND ATRIUM	SALON PIERRE DE COUBERTIN
07:00 - 07:30							Free Breakfast for the Omni Guests (staying at conference venue)
07:30 - 08:00	ONSITE & PICKUP REGISTRATION* (also open on the eve, Saturday October 3rd, from 13:00 to 17:00)						
08:00 - 08:30		KEYNOTE: John B. Kenney, Director and Principal Researcher, Toyota InfoTechnology Center, USA					
08:30 - 09:00							
09:00 - 09:30		PANEL: Next Generation Transportation Systems - Automated, Connected and Zero-Emission	SESSION WOS #04-1 Broadband Wireless Communication between Computer Boards (Atto-Nets)	TUTORIAL 1 Stochastic Geometry Modeling of Ultra-Dense Heterogeneous Cellular Networks: Simulation, Performance Evaluation, and Experimental Validation	TUTORIAL 2 Dedicated Short Range Vehicular Communications: Overview, Technical Challenges, and Applications	Exhibits	
09:30 - 10:00							
10:00 - 10:30							
10:30 - 11:00						Coffee Break	
11:00 - 11:30			SESSION WOS #04-2 Broadband Wireless Communication between Computer Boards (Atto-Nets)	TUTORIAL 1 Stochastic Geometry Modeling of Ultra-Dense Heterogeneous Cellular Networks: Simulation, Performance Evaluation, and Experimental Validation	TUTORIAL 2 Dedicated Short Range Vehicular Communications: Overview, Technical Challenges, and Applications	Exhibits	
11:30 - 12:00							
12:00 - 12:30							
12:30 - 13:00							LUNCH
13:00 - 13:30							
13:30 - 14:00	ONSITE & PICKUP REGISTRATION	INVITED TALK: Avinash Karanth Kodi, Professor, Ohio University, USA INVITED TALK: Meik Dörpinghaus, Research Group Leader, Center for Advancing Electronics Dresden, Germany				Exhibits	
14:00 - 14:30			SESSION WOS #05 V2X Communications: Safety, Automated Driving, and Other Applications	TUTORIAL 3 Emerging Green Technologies for 5G Wireless Networks: From Theory to Practice	TUTORIAL 4 Communication Architectures and Networking for Electric Vehicles in the Smart Grid		
14:30 - 15:00							
15:00 - 15:30							
15:30 - 16:00						Coffee Break	
16:00 - 16:30				TUTORIAL 3 Emerging Green Technologies for 5G Wireless Networks:From Theory to Practice	TUTORIAL 4 Communication Architectures and Networking for Electric Vehicles in the Smart Grid	Exhibits	
16:30 - 17:00							
17:00 - 17:30							
17:30 - 18:00							
18:00 - 18:30							
18:30 - 19:00							
19:00 - 19:30							
19:30 - 20:00							
20:00 - 20:30							
20:30 - 21:00							
21:00 - 21:30							
21:30 - 22:00							

DAY 2, MONDAY OCTOBER 5TH, 2015

FEATURED THEME OF THE DAY: WIRELESS FOR INDIVIDUAL'S HEALTH, WELLBEING, CULTURE, AND SOCIETY

	REGISTRATION DESK	SALON DES SAISONS A	SALON PRINTEMPS	SALON DES SAISONS B	SALON ÉTÉ	FOYER AND ATRIUM	SALON PIERRE DE COUBERTIN
07:00 - 07:30	ONSITE & PICKUP REGISTRATION						Free Breakfast for the Omni Guests (staying at conference venue)
07:30 - 08:00							
08:00 - 08:30		BRIEF OPENING (15 min) & KEYNOTE: Robert Weigel, Professor, University of Erlangen-Nuremberg, Germany					
08:30 - 09:00							
09:00 - 09:30		PANEL: Wireless as a Key Enabler of Wearable and Implantable Devices for Smarter Health and Wellbeing	SESSION SPS #02 Wireless Terahertz Communications	SESSION REG #01 Cooperative & Relayed Communication Techniques I	SESSION REG #02 Ranging, Imaging & Positioning I	Exhibits	
09:30 - 10:00							
10:00 - 10:30							
10:30 - 11:00						Coffee Break	
11:00 - 11:30		INVITED TALK: Urbashi Mitra, Professor, University of Southern California, USA	SESSION REG #03 Sensor/RFID Systems & Networks	SESSION REG #04 Reconfigurable/Self-Adaptive Components & Devices	SESSION REG #05 Modulation, Detection & Coding	Exhibits	
11:30 - 12:00							
12:00 - 12:30							
12:30 - 13:00							LUNCH
13:00 - 13:30							
13:30 - 14:00	ONSITE & PICKUP REGISTRATION	INVITED TALK: Slim Alouini, Professor, KAUST, Saudi Arabia	SESSION SPS #01 Wireless Transceivers Intende for Healthcare Applications	SESSION REG #06 RF Modules, Circuits & Systems I	SESSION REG #07 Multiple/Radio Access & Interference Mitigation Techniques	Exhibits	
14:00 - 14:30							
14:30 - 15:00							
15:00 - 15:30							
15:30 - 16:00						Coffee Break	
16:00 - 16:30		PANEL: Wireless Broadband as a New Playground: a New Dimension for Cultural Creation, Hybrid Physical Spaces, and Virtual Collaborative Spaces				Exhibits	
16:30 - 17:00							
17:00 - 17:30							
17:30 - 18:00							
18:00 - 18:30							
18:30 - 19:00	TRANSFER TO SAT						
19:00 - 19:30	WELCOME RECEPTION @ SAT 1201, Bld Saint-Laurent Montréal, QC, H2X 2S6						
19:30 - 20:00							
20:00 - 20:30							
20:30 - 21:00							
21:00 - 21:30							
21:30 - 22:00							

DAY 3, TUESDAY OCTOBER 6TH, 2015

FEATURED THEME OF THE DAY: 5G WIRELESS TECHNOLOGIES AND STANDARDS

	REGISTRATION DESK	SALON DES SAISONS A	SALON PRINTEMPS	SALON DES SAISONS B	SALON ÉTÉ	FOYER AND ATRIUM	SALON PIERRE DE COUBERTIN
07:00 - 07:30	ONSITE & PICKUP REGISTRATION						Free Breakfast for the Omni Guests (staying at conference venue)
07:30 - 08:00							
08:00 - 08:30							
08:30 - 09:00		KEYNOTE: Bernard Lord, President & CEO, CWTA, Canada					
09:00 - 09:30		KEYNOTE: Bruce Rodin, VP Wireless Technology, Bell Canada, Canada					
09:30 - 10:00		KEYNOTE: David Keegstra, CTO, Ericsson Canada Inc., Canada					
10:00 - 10:30						Coffee Break	
10:30 - 11:00		PANEL: Standards and Global Regulatory Activities in Canada	SESSION WOS #02 Challenges of Millimeter Wave Spectrum (Above 10GHz) in Next Generation (5G) Wireless Networks	SESSION REG #08 Intelligent Transportation Systems (ITS) & Traffic Fluidity	SESSION REG #09 Ranging, Imaging & Positioning II	Exhibits	
11:00 - 11:30							
11:30 - 12:00							
12:00 - 12:30							
12:30 - 13:00							LUNCH
13:00 - 13:30							
13:30 - 14:00	ONSITE & PICKUP REGISTRATION		SESSION WOS #03 Fiber-Wireless (FiWi) Access Networks	SESSION REG #10 Advanced Channel Estimation & Combining Techniques	SESSION REG #11 Small Cells & Heterogeneous Networks (HetNet)	Exhibits	
14:00 - 14:30							
14:30 - 15:00							
15:00 - 15:30		KEYNOTE: Robert W. Heath, Professor, University of Texas at Austin, USA					
15:30 - 16:00							
16:00 - 16:30						Coffee Break	
16:30 - 17:00		PANEL: Challenges of Millimeter Wave Spectrum (Above 10GHz) in Next Generation (5G) Wireless Networks		SESSION REG #12 Low-Power & Low-Cost Designs	SESSION REG #13 RF Modules, Circuits & Systems II	Exhibits	
17:00 - 17:30							
17:30 - 18:00							
18:00 - 18:30							
18:30 - 19:00							
19:00 - 19:30							BANQUET
19:30 - 20:00							
20:00 - 20:30							
20:30 - 21:00							
21:00 - 21:30							
21:30 - 22:00							

DAY 4, WEDNESDAY OCTOBER 7TH, 2015

FEATURED THEME OF THE DAY: WIRELESS FOR SUSTAINABILITY, ENVIRONMENT, RESSOURCES, AND INFRASTRUCTURE

	REGISTRATION DESK	SALON DES SAISONS A	SALON PRINTEMPS	SALON DES SAISONS B	SALON ÉTÉ	FOYER AND ATRIUM	SALON PIERRE DE COUBERTIN
07:00 - 07:30	ONSITE & PICKUP REGISTRATION						Free Breakfast for the Omni Guests (staying at conference venue)
07:30 - 08:00							
08:00 - 08:30							
08:30 - 09:00		KEYNOTE: Gordon Feller, Director, IoE, Cisco Systems, USA (starts at 08:45 AM)					
09:00 - 09:30							
09:30 - 10:00		PANEL: Sustainability through Ubiquitous Wireless Broadband	SESSION WOS #06 Communications with Energy Harvesting and Wireless Power Transfer	SESSION WOS #01-1 Communications in Underground and Confined Environments	SESSION REG #14 Ranging, Imaging & Positioning III	Exhibits	
10:00 - 10:30							
10:30 - 11:00							
11:00 - 11:30						Coffee Break	
11:30 - 12:00			SESSION WOS #07-1 Next Generation of Green ICT and 5G Networking (GreeNets)	SESSION WOS #01-2 Communications in Underground and Confined Environments	SESSION REG #15 RF Filtering, Isolation & Suppression Techniques	Exhibits	
12:00 - 12:30							
12:30 - 13:00							
13:00 - 13:30							AWARDS LUNCHEON
13:30 - 14:00							
14:00 - 14:30							
14:30 - 15:00	ONSITE & PICKUP REGISTRATION	PANEL:Wireless Techs & Apps for Smarter Operations in Confined, Remote, or Adverse Environments - Earth, Space, and Oceans	SESSION WOS #07-2 Next Generation of Green ICT and 5G Networking (GreeNets)	SESSION REG #16 Slot Antenna Design Technologies	SESSION REG #17 Cooperative & Relayed Communication Techniques II	Exhibits	
15:00 - 15:30							
15:30 - 16:00							
16:00 - 16:30						Coffee Break	
16:30 - 17:00			SESSION WOS #07-3 Next Generation of Green ICT and 5G Networking (GreeNets)	SESSION REG #18 UWB Antenna Design Technologies	SESSION REG #19 Performance Analysis & Channel Characterization Under New Transmission Conditions	Exhibits	
17:00 - 17:30							
17:30 - 18:00							
18:00 - 18:30							
18:30 - 19:00			ICUWB ExCom Meeting				
19:00 - 19:30							
19:30 - 20:00							
20:00 - 20:30							
20:30 - 21:00							
21:00 - 21:30							
21:30 - 22:00							

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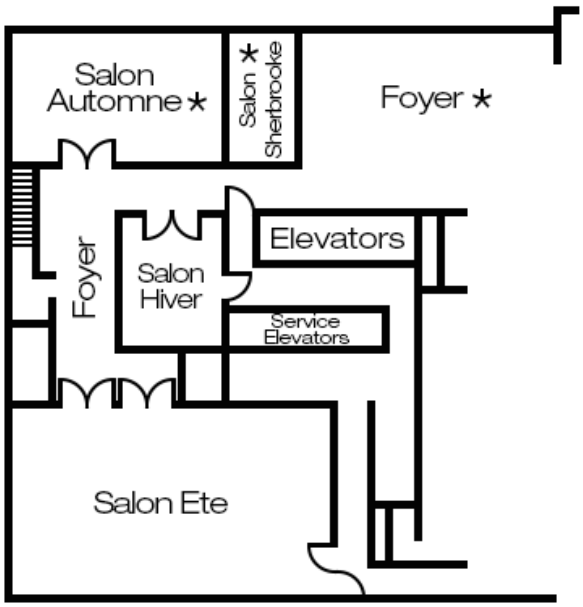
1ST FLOOR

2ND FLOOR



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GGD are proud to sponsor the IEEE International Conference on Ubiquitous Wireless Broadband (ICUWB) 2015 and look forward to meeting you!

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Radovan Miucic	Honda R&D Americas	USA
Paolo Monti	KTH Royal Institute of Technology	Sweden
Lorenzo Mucchi	University of Florence	Italy
Sami Muhaidat	Khalifa University	UAE
Rafik Naccache	Concordia University	Canada
Montse Nájar	Universitat Politècnica de Catalunya	Spain
Monica Navarro	Centre Tecnològic de Telecomunicacions de Catalunya (CTTC)	Spain
Mourad Nedil	UQAT	Canada
Chahe Nerguizian	Ecole Polytechnique	Canada
Derrick Wing Kwan Ng	Friedrich-Alexander-University Erlangen-Nürnberg	Germany
Hideki Ochiai	Yokohama National University	Japan
Menguc Oner	Isik University	Turkey
Jessica Oueis	CEA-LETI	France
Laurent Ouvry	CEA-LETI Minatec	France
Kyle Jung-Lin Pan	InterDigital Communications	USA
Dorin Panaitopol	Thales Communications & Security (TCS)	France
Przemyslaw Pawelczak	Delft University of Technology	The Netherlands
Benoit Pelletier	InterDigital Canada	Canada
Athina Petropulu	Rutgers, The State University of New Jersey	USA
Philip Pietraski	InterDigital Communications	USA
Michal Pietrzyk	Fraunhofer Institute for Integrated Circuits	Germany
Tony Q. S. Quek	Singapore University of Technology and Design	Singapore
Shaolei Ren	University of California, Riverside	USA
Arnab Roy	InterDigital Communications	USA
Jürgen Sachs	Ilmenau University of Technology	Germany
Brian Sadler	Army Research Laboratory	USA

Abdelaziz Samet	INRS-EMT	Canada
Fortunato Santucci	University of l'Aquila	Italy
Mamoru Sawahashi	Tokyo City University	Japan
Robert Schober	University of British Columbia	Canada
Riccardo Scopigno	Istituto Superiore Mario Boella	Italy
Shahram ShahbazPanahi	University of Ontario Institute of Technology	Canada
Abdallah Shami	The University of Western Ontario	Canada
Yuan Shen	Tsinghua University	P.R. China
Lei Shu	Guangdong University of Petrochemical Technology	P.R. China
Dirk Slock	EURECOM	France
Besma Smida	University of Illinois at Chicago	USA
Daniel Steinbach	InterDigital Communications, LLC	USA
Richard Stirling-Gallacher	Huawei	USA
Himal Suraweera	University of Peradeniya	Sri Lanka
Serioja Ovidiu Tatu	INRS-EMT	Canada
John Thompson	University of Edinburgh	United Kingdom
Velio Tralli	University of Ferrara - Italy	Italy
Le Chung Tran	University of Wollongong	Australia
Le-Nam Tran	Maynooth University	Ireland
Imene Trigui	INRS-EMT	Canada
Charalampos Tsimenidis	Newcastle University	United Kingdom
Jitendra Tugnait	Auburn University	USA
Murat Uysal	Ozyegin University	Turkey
Shahrokh Valaee	University of Toronto	Canada
Remy Vauche	Aix-Marseille University	France
Rein Vesilo	Macquarie University	Australia
Alexey Vinel	Halmstad University	Sweden
Giorgio M. Vitetta	University of Modena and Reggio Emilia	Italy
Sergiy Vorobyov	Aalto University	Finland
Lin Wang	Xiamen University	P.R. China
Xianbin Wang	University of Western Ontario	Canada
Yazhou Wang	RF Micro Devices	USA
Kevin Wanuga	Drexel University	USA
Hong Wei	Southeast University	P.R. China
Werner Wiesbeck	Karlsruhe Institute of Technology	Germany
Klaus Witrisal	Graz University of Technology	Austria
Henk Wymeersch	Chalmers University of Technology	Sweden
Wei Yu	University of Toronto	Canada
Mehmet Rasit Yuce	Monash University	Australia
Chau Yuen	Singapore University of Technology and Design	Singapore
Slim Zaidi	INRS-EMT	Canada
Thomas Zemen	AIT Austrian Institute of Technology GmbH	Austria
Qian Zhang	InterDigital	USA
Jun Zhang	The Hong Kong University of Science and Technology	Hong Kong
Yu Zhang	Zhejiang University	P.R. China
Xiangyun Zhou	The Australian National University	Australia
Guangxu Zhu	Zhejiang University	P.R. China

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Pervasive and Smart Wireless Applicationsfor the Digital Economy (PERSWADE)

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McGill

Our Research Scope

Our interdisciplinary research scope covers three WNS (wireless networks and systems) inter-twined research thrusts:

Smart Communications

5G Technologies, Wireless Cloud, Sensor Networks, Internet of Things, Green ICT, etc.

Smart Monitoring

Health and Safety, Environment, Renewable Energies, Natural Resources, Infrastructures, etc.

Smart Management

Transport Systems and Vehicles, Resources and Power Grids, Urban Development and Cities, Hospitals, Offices and Homes, Production, Distribution and Services, etc.

WWW.CREATE-PERSWADE.CA

WHAT IS PERSWADE?

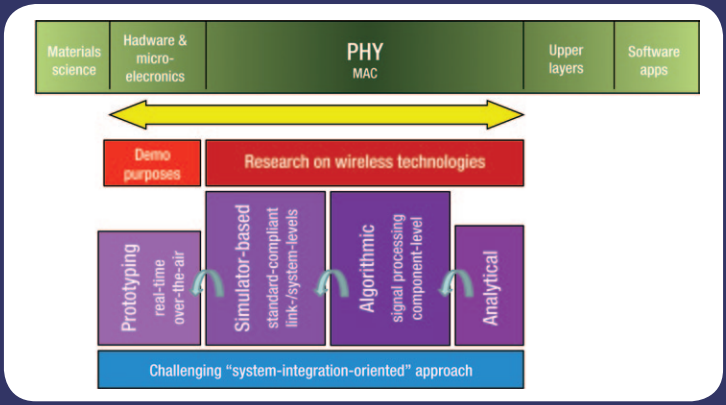
Intended for students and researchers, and guided by practical needs of industry, PERSWADE is a unique advanced research training program in wireless. It aims to help participants to be better equipped to meet the technological and economic challenges of the future.

A CREATE program of NSERC headquartered at the EMT Center of INRS

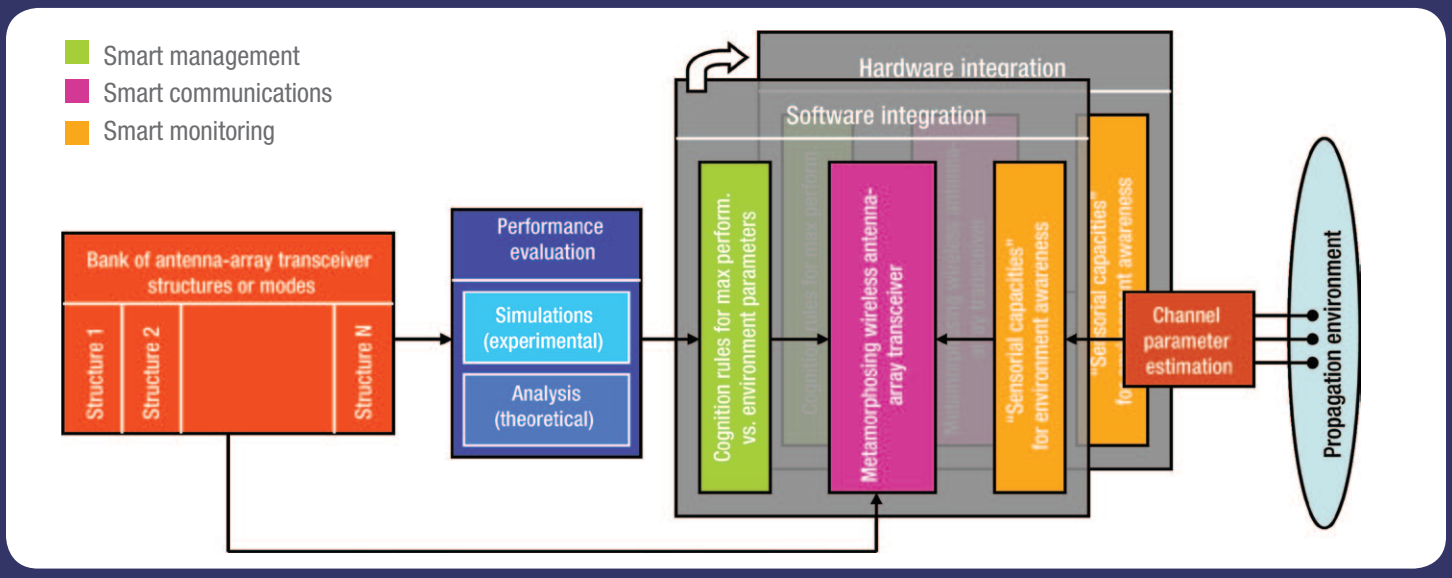
Lead institution:
INRS Université de recherche A research university

Funded by:
CRSNG NSERC

SYSTEM-INTEGRATION-ORIENTED RESEARCH APPROACH:



One of the prime objectives of the Wireless Lab is to showcase with demos the new wireless transceiver technologies developed by its team members to significantly strengthen the scope of its research achievements and increase the potential of their technology transfer. The Wireless Lab has been, indeed, an advocate of a challenging "system-integration-oriented approach" in algorithmic research on signal processing for wireless communications that jointly tackles most of physical-layer issues; takes into account interaction between subsystem components, any source of imperfection such as estimation and modeling errors, implementation feasibility and costs, etc.; and that integrates standardized link- and system-level simulations, prototyping, and evaluation in real-world conditions in the assessment methodology, thereby providing tremendous added values in terms of scientific impact and industrial relevance. An inspiring experience that allowed the Wireless Lab to shape the scope and vision of PERSWADE (www.create-perswade.ca) about **smart communications**, **monitoring & management** (from devices to networks), and **wireless techs & apps**, respectively.



COLLABORATIVE RESEARCH WITH INDUSTRY:

Over more than a decade, the Wireless Lab has already been able to gain the strong support of many industrial partners among wireless equipment manufacturers, service providers, SMEs, start-ups or governmental agencies, through major and successful partnership projects on advanceds wireless transceiver designs. It currently focuses on the development of new major paradigm-shifting wireless access virtualization schemes and "in-software metamorphosing" antenna-array transceiver designs.

RESEARCH TRAINING:

The Wireless Lab offers a very stimulating environment for training. This environment could indeed help students learn to give up oversimplified analytical approaches for sophisticated system-level simulators that far-better grasp the complexity of today's radio access and provide more realistic and reliable results and insights. It could help them better understand standards when, very often ignored, could challenge work assumptions and value. It could help students understand technology evolution challenges from an idea to a potential real-world application product. Through its network of industrial and university collaborators, the Wireless Lab also provides students with precious opportunities for mobility, nationally or internationally, through internships or postdoctoral stays at world-class venues in industry or academia.

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Wirelesslab

KEYNOTE SPEECHES

Sunday, October 4th, 8:00 – 9:00, SALON DES SAISONS A

Toward the Widespread Deployment of Connected Vehicles (twinned with WOS #05)

John B. Kenney, Director and Principal Researcher, Toyota InfoTechnology Center, USA

Vehicles are the new frontier for wireless communications. Connected car technologies developed for the highly mobile vehicle environment are being prepared for deployment, including Dedicated Short Range Communications (DSRC). This talk discusses the current state of DSRC, some challenges that need to be addressed, and the path to deployment in various regions. We will also briefly consider the nascent development of cellular V2X technology.

Monday, October 5th, 8:00 – 9:00, SALON DES SAISONS A

Ultra-Wideband Microwave Sensors for Biomedical Spectroscopy Applications (twinned with first-day's key theme on wireless for health, wellbeing, culture, etc.)

Robert Weigel, Professor, University of Erlangen-Nuremberg, Germany

UWB biosensor systems are becoming an attractive, reliable solution to supervise the health status of human persons, e.g. of patients with chronic diseases, in a noninvasive, safe and continuous way thus reducing time and cost of hospitalization and additionally increasing the independency of the patients. Depending on their wavelength electromagnetic waves can penetrate biocompatible coatings and human tissues to a certain extent, allowing for noninvasive sensing that can be spatially localized. The presentation explains the theory of UWB spectroscopy and introduces different system concepts for the generation and acquisition of UWB signals. It shows solutions for the injection of electromagnetic waves into biological samples and demonstrates applications of UWB biosensors. Finally, future developments trends are discussed.

Tuesday, October 6th, 8:30 – 9:00, SALON DES SAISONS A

On the Brink of Transformative Change (twinned with third-day's key theme on 5G wireless technologies and standards)

Bernard Lord, President & CEO, Canadian Wireless Telecommunications Association (CWTA), Canada

We are witnessing a virtual revolution in the way wireless services are delivered and consumed right across Canada. It's all about connecting Canadians. And it's changing how we live and how we do business. Smart homes, smart factories, smart vehicles, smart cities, and smart grids – all are now possible. From people to people to machine to people and now machine to machine, the scale is almost unimaginable. The productivity potential is staggering if we embrace the 5G revolution in as smart a way as possible.

Tuesday, October 6th, 9:00 – 9:30, SALON DES SAISONS A

An Operator's View of 5th Generation Networks (twinned with third-day's key theme on 5G wireless technologies and standards)

Bruce Rodin, Vice President Wireless Technology, Bell Canada, Canada

Evidence of the societal and economic impacts of modern communications networks are seen by all of us on a daily basis. Innovation leads to new applications of the technologies which drive traffic growth resulting in additional investments delivering further innovation. This global cycle of investment has iterated many times since the inception of the early mobile systems and continues today with the introduction of the full capabilities of LTE-Advanced. As we look to the future, how do we shape our expectations of how we can best lever these forces to provide a significant increase in capability? How do we set the stage to deliver capability that is truly worth of a generational increment? In this talk Mr. Rodin will share his views on 5th generation systems from the Network Operators perspective.

Tuesday, October 6th, 9:30 – 10:00, SALON DES SAISONS A

5G – Accelerating the Internet-of-Things (twinned with third-day's key theme on 5G wireless technologies and standards)

David Keegstra, Chief Technology Officer, Ericsson Canada Inc., Canada

The presentation systematically makes the case for 5G being an enabler of the Networked Society, with specific reference to the Internet-of-Things. The big numbers to be associated with the IoT by the year 2020 – be they market-related (the value-add of 5G) or device-related (number of connected devices), etc. – are clearly explained. As demonstrated, the path to IoT has already started, with a reduction in the cost of devices, increase in battery life, improvements in coverage and service prioritization (thru' admission control mechanisms); this path will only accelerate in the future.

Tuesday, October 6th, 15:00 – 16:00, SALON DES SAISONS A

Millimeter Wave MIMO Communication (twinned with WOS #02)

Robert W. Heath, Professor, University of Texas at Austin, USA

Millimeter wave communication is coming to a wireless network near you. Because of the small antenna size and the need for array gain, array processing is important in millimeter wave communication systems. This presentation provides an overview of millimeter wave communication systems. Particular attention is paid to the ways that MIMO communication has played a role in the past and how it may play a role in the future.

Wednesday, October 7th, 8:45 – 9:30, SALON DES SAISONS A

Smart + Connected City WiFi: Improving City Operations and Services for Engaged Citizens (twinned with WOS #06 and WOS #07)

Gordon Feller, Director, Internet of Everything, Cisco Systems; and Founder, Meeting of the Minds, USA

When we harness the untapped powers of broadband we accelerate our transition to smarter/greener economies. Deepening broadband's impact requires much more than better connected technologies. Emerging innovations are reshaping our systems in ways that have begun to radically alter our hardscapes (such as roads); shift the ways we design and use buildings; strengthen ecosystems and maybe even societies. From autonomous vehicles that drive and park themselves to data analytics which manage traffic flows while remaking grids -- smart and connected cities are one early manifestation of the big shifts emerging as a result of higher-speed connnectivity. It's adding up to more than extra-efficient cities which are more productive and more livable. Gordon will provide us a glimpse around the corners, offering a clear-eyed view of alternative urban futures which are already emergent.

PANELS

Sunday, October 4th, 9:00 – 10:30, SALON DES SAISONS A

Next Generation Transportation Systems - Automated, Connected and Zero-Emission (twinned with WOS #05)

Panelists:

- *François Adam, General Manager, Innovative Vehicle Institute, Canada*
- *Hussein Mouftah, Professor, University of Ottawa, USA*
- *Célestin Ratsimbazafy, Senior Engineer, Orientations and Integration – Energy Efficiency, Hydro Québec, Canada*

Moderator:

- *Joachim G. Taiber, Professor, Clemson University, Director, Sustainable Mobility Institute, and CTO, ITIC, USA*

Organizers:

- *Sofiène Affes, Professor, INRS-EMT, and Director, PERSWADE, Canada*
- *Charles Despins, President and CEO, Prompt Inc., Canada*

The transportation world is in a major transition phase triggered by innovations in the domains of information, communication and energy systems which lead to fully automated, fully connected and zero-emission on-demand fleet solutions that can be operated for public, private and commercial transportation. Most important is develop on the one hand policies which support and leverage the technology progress in V2X, robotics, power train electrification, smart grid and heterogeneous high performance wireless networks and on the other hand hand provides standardization roadmaps to industry to optimize R&D resources and translate them into market success. The panel will highlighy different technology, policy and standardization aspects that are important to build a new transportation ecosystem which provides a higher quality experience, can handle the load dynamically and minimizes the carbon footprint. In particular emphasis will be given on urban mobility and intermodal transportation models that take full advantage of the new technical opportunities.

Monday October 5th, 09:00-10:30, SALON DES SAISONS A

Wireless as a Key Enabler of Wearable and Implantable Devices for Smarter Health and Wellbeing (twinned with first-day's key theme on wireless for health, wellbeing, culture, etc.)

Panelists:

- *Alexandre Fainberg, Co-Founder and COO, Heddoko, Canada*
- *Pierre-Alexandre Fournier, Co-Founder and CEO, Hexoskin, Canada*
- *Robert Weigel, Professor, University of Erlangen-Nuremberg, Germany*

Moderator:

- *Mohamad Sawan, Professor, Polytechnique Montréal, and Director, ReSMiQ Research Centre, Canada*

Organizer:

- *Sofiène Affes, Professor, INRS-EMT, and Director, PERSWADE, Canada*
- *Faouzi Bellili, Research Associate, INRS-EMT, and Project Coordinator, 5G-WAVES, Canada*

This panel is devoted to the various healthcare and wellbeing wireless technologies, which cover an increasing number of topics, in particular many types of circuits and systems intended to build emerging microwatt and high-data-rate wireless. In fact, the projected widespread wearable and implantable wireless applications (such as sensing EEG, ECG, ENG, etc.. monitoring environment, smart home, and many other applications to guide people to find their way, to hear, etc.) have to operate at ultra-low power, which is one of the major challenges faced in electronics nowadays. Innovation is required at both levels of circuits (e.g., LNA, Mixer, VCO, PA, memory, sensor, etc.) and systems (e.g., new communication schemes, wake-up radio, cognitive radio, sensor networks, IoT, etc.). Great progress has been seen in past years towards autonomous systems where energy can be extracted locally at the sensor nodes. Microwatt wireless communication requires consistent numbers of research directions, such as modeling and analysis frameworks, new wireless communication schemes that reduce average energy consumption, energy

harvesting schemes and power management, wireless power transfer, ultra-low power design using non-traditional devices and techniques (MEMS, 3D packaging, etc.). Panelists should address: 1) industry trends and needs, 2) technology evolution & challenges, 3) research funding, 4) industrial involvement and support, 5) education impact, and 6) social-economic impact.

Monday October 5th, 16:00-17:30, SALON DES SAISONS A

Broadband Wireless as a New Playground: a New Dimension for Cultural Creation, Hybrid Physical Spaces, and Virtual Collaborative Spaces (twinned with first-day's key theme on wireless for health, wellbeing, culture, etc.)

Panelists:

- *Alexia Bhéreur-Lagounaris, Researcher, INRS-UCS, and Coordinator, VESPA, Canada*
- *Yan Côté, Co-Founder and CTO, Vrvana, Canada*
- *Mathieu Dupont, CTO, Miralupa, Canada*
- *Philippe Rincon, Principal Director of Digital Strategy, Quebecor Media, Canada*
- *Zack Settel, Media Artist, Composer, and Associate Researcher, SAT, Canada*

Moderator:

- *Luc Courchene, Founding Member and Co-Director of Research, SAT, Canada*

Organizers:

- *Sofiène Affes, Professor, INRS-EMT, and Director, PERSWADE, Canada*
- *Charles Despins, President and CEO, Prompt Inc., Canada*

Wireless broadband is opening a formidable space for creation and experience. Beyond applications in telepresence, on-line gaming, or known forms of virtual, augmented, and mixed reality, what to make of this yet largely unchartered cultural terrain? How will generous and ubiquitous wireless bandwidth help develop and propel new immersive and participative spaces? This panel invites artists, academics, and technologists carrying visions and expressing needs to inspire an information infrastructure capable of supporting 21st-century cultures.

Tuesday, October 6th, 10:30 – 12:00, SALON DES SAISONS A

International Standards and Global Regulatory Activities in Canada (twinned with third-day's key theme on 5G wireless technologies and standards)

Panelists:

- *Marc Dupuis, Director General, Communications Research Centre Canada, Canada*
- *Bruce Gustafson, Vice President, Government and Industry Affairs, Ericsson North America, USA*
- *David Keegstra, Chief Technology Officer, Ericsson Canada Inc., Canada*
- *Jim MacFie, National Standards Officer, Microsoft Canada, Canada*
- *Bruce Rodin, Vice President Wireless Technology, Bell Canada, Canada*

Moderator:

- *Veena Rawat, Communications Technologies Consultant, Canada*

Organizer:

- *Venkatesh Sampath, Director, Regulatory Affairs and Standards Policy, Ericsson Canada Inc., Canada*

The objective of this panel is to address the various challenges that Canada faces on the standards and regulatory fronts at an international level (e.g. ITU, IEEE, 3GPP, etc.), and how it prepares for these challenges through ' national' (Canada-wide) activities. Challenges include ' IPR and standards' , the enormous growth in traffic on mobile/telecommunications networks and its effect on technology/devices/infrastructure, internet governance (model is changing from US-centric to global) and so on. These challenges will have to be met through continuously evolving Canadian ICT policies (e.g. National Broadband Plans) and continuing Canadian participation in international standards as well as regulatory activities.

Tuesday, October 6th, 16:30 – 18:00, SALON DES SAISONS A

Challenges of Millimeter Wave Spectrum (Above 10GHz) in Next Generation (5G) Wireless Networks (twinned with WOS #02)

Panelists:

- *Carlos Cordeiro, Principal Engineer, Platform Engineering, Intel, USA*
- *Robert Heath, Professor, University of Texas at Austin, USA*
- *Malcolm Robertson, 5G Planning Manager, CTO Office, Keysight Technologies, USA*
- *Peiying Zhu, Director, North American Wireless Research and Standards, Huawei Technologies, Canada*

Moderator:

- *Monisha Ghosh, Principal Engineer, Wireless Systems Incubation, InterDigital, USA*

Organizers:

- *Vincent Roy, Director, Wireless Systems Incubation, InterDigital, Canada*
- *Ravi Pragada, Principal Engineer, Wireless Systems Incubation, InterDigital, USA*

The panel will be composed of mmW experts coming from both the industry and academia. The Panel will address some of the fundamental issues and challenges facing mmW communications and the role it is bound to play in 5G systems. Example of questions to be discussed at the panel:

- Can mmW be a reliable carrier for the outdoor network considering the propagation characteristics and mobility?
- What will be the extent of outdoor to indoor penetration at mmW? How do we provision for mmW indoor coverage?
- World-wide regulatory issues and orchestration of mmW bands - Role of licensed, lightly-licensed, and unlicensed bands.
- Standardization aspects: 3GPP vs IEEE. Is there a need for 3GPP oriented mmW carrier development in light of 802.11ad/WiGig? If yes, what is the extent of reuse from 802.11ad technology for 3GPP mmW carrier?
- Biggest obstacles in the deployment of mmW technology on the Radio Access side? On the device side?

Wednesday, October 7th, 9:30 – 11:00, SALON DES SAISONS A

Sustainability through Ubiquitous Wireless Broadband (twinned with WOS #06 and WOS #07)

Panelists:

- *Jaafar Elmirghani, Professor, University of Leeds, U.K.*
- *Gordon Feller, Director, Internet of Everything, Cisco Systems; and Founder, Meeting of the Minds, USA*
- *Magnus Olsson, Senior Researcher, Energy Performance, Ericsson Research, Sweden*
- *John Robinson, Professor, University of British Columbia, Canada*

Moderators:

- *Charles Despins, President & CEO, Prompt, Canada*
- *Hugh Mansfield, Senior Partner, Goudreau Gage Dubuc, Canada*

Sustainability is a concept resting on three pillars i.e. positive impacts in economic, environmental and social terms. This panel will address opportunities and challenges to achieve sustainability in a not so future world desirably equipped with ubiquitous, ultra-fast, wireless broadband technologies. These issues are to be tackled through cross-disciplinary and holistic approaches to technology, public policy and community engagement processes. Energy efficiency, reduction of carbon and other polluting emissions and (technology as well as “social”) life cycle are critical metrics to leverage in the quest for a sustainable and connected world in the 21st century.

Wednesday October 7th, 14:30-16:00, SALON DES SAISONS A

Panel on Wireless Techs & Apps for Smarter Operations in Confined, Remote, or Adverse Environments - Earth, Space, and Oceans

(twinned with fourth-day's key theme on wireless for sustainability, environment, etc.)

Panelists:

- *Ali Abedi, Professor, University of Maine, USA*
- *Denis Couillard, Director of Products Innovation, Ultra Electronics TCS, Canada*
- *Paul Fortier, Professor, Université Laval, Canada*
- *Dominique Gauthier, CTO, iBwave, Canada*

Moderators and organizers:

- *Sofiène Affes, Professor, INRS-EMT, and Director, PERSWADE, Canada*
- *Abdelaziz Samet, Research Associate, INRS-EMT, and Co-Director, Wireless Lab, Canada*

This panel will discuss the potential role and pending challenges of wireless techs & apps (M2M, V2V, V2X, IoT, wireless sensors and sensor networks, localization, tracking, ranging, detection, etc.) in enabling through automation, self organization, and telerobotics "smarter" operations (surveillance, monitoring, geosensing, geomatics, exploration, exploitation, prevention, early warning, rescue, etc.) and living/work conditions (safety, security, health, environment, wellbeing, connectivity to the world, etc.) in harsh, hazardous, or extreme environments such as:

- indoor or confined (inside buildings, air crafts, trains, etc.);
- underground (e.g., mines, city tunnels or water distribution networks, etc.);
- air and space;
- maritime; etc.

The panel will also discuss applications of wireless techs & apps under such conditions for mining, forestry, and fisheries, etc., for remote communities and areas, and in the Arctic and the Northern regions.

Please join us for our panel session

Sustainability through Ubiquitous Wireless Broadband

following Wednesday's Keynote Speech by Gordon Feller

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IEEE GREENICT

Panelists:

Jaafar Elmirghani, Professor, University of Leeds

Gordon Feller, Director, Office of the EVP, Cisco Systems; Founder, Meeting of the Minds

Magnus Olsson, Senior Researcher, Energy Performance, Ericsson Research

John Robinson, Professor, University of British Columbia

Moderators:

Charles Despins, President & CEO, Prompt Inc.

Hugh Mansfield, Senior Partner, Goudreau Gage Dubuc

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INVITED TALKS

Sunday, October 4th, 13:30 – 14:30, SALON DES SAISONS A

Communication-Centric Many-Core Computing: Opportunities and Challenges (twinned with WOS #04)

Avinash Karanth Kodi, Professor, Ohio University, USA

As technology scales into the nanometer regime, growth in the density of transistors per unit area has accelerated the proliferation of the number of cores integrated onto the same die. As aggressive technology scaling is paving the way to harness enormous computing power on the chip, the design of the interconnection network—which acts as the glue that connects all the discrete components (cores, chips, DRAM, and I/O) – is becoming an important challenge from both the bandwidth and energy perspectives in future manycore systems. In this talk, I will provide an outline of the challenges in this evolving manycore computing where communication energy will exceed the computing energy costs in the future and thereby affect all computing devices from handheld smartphones to large high-performance computing (HPC) systems. Alternate technologies such as wireless and photonics are proposed for designing the communication fabric to solve pin-limited and frequency-limited energy constraints of wired interconnects. I will discuss the opportunities and challenges offered by these emerging technologies for manycore computing.

Sunday, October 4th, 14:30 – 15:30, SALON DES SAISONS A

A New Communication Architecture for Highly Adaptive Energy-Efficient Computing (twinned with WOS #04)

Meik Dörpinghaus, Research Group Leader, Center for Advancing Electronics Dresden, Germany

The visionary goal of the Collaborative Research Center HAEC (Highly Adaptive Energy-efficient Computing) is to research technologies to enable computing systems with high energy efficiency without compromising on high performance. Certainly a straightforward way for improving energy efficiency is to reduce the energy consumption of every individual hardware component involved. However, it is equally important to understand how the software system can be adapted to the hardware and vice versa. As the computational problems that are being executed on parallel processors require a certain amount of problem-specific inter¬-communication between the computations, a highly adaptive hardware system, which can optimize its configuration according to the needs of a software system, could generate a much higher level of efficiency. To achieve the goal of an integrated approach of highly adaptive energy-efficient computing (HAEC), the problem is approached at all levels of technology involved, the hardware, the computer architecture and operating system, the software modeling as well as the application modeling and runtime control levels. A novel concept, namely the HAEC Box, of how computers can be built by utilizing innovative ideas of optical and wireless chip-to-chip communication is explored. This enables a new level of run-time adaptivity of future computers, creating a platform for flexibly adapting to the needs of the computing problem. The HAEC Box is a first attempt to achieve high adaptivity and energy efficiency with an integrated approach going through all levels of abstraction, from hardware components all the way to the application software. In this talk, we mainly discuss the new communication architecture including the wireless chip-to-chip communication.

Monday, October 5th, 11:00 – 12:00, SALON DES SAISONS A

Communication Techniques for Bacterial Networks (twinned with first-day's key theme on wireless for health, wellbeing, culture, etc.)

Urbashi Mitra, Professor, University of Southern California, USA

Microbial communities play a significant role in bioremediation, plant growth promotion, human and animal digestion, disease, elemental cycles, the carbon-cycle and maintaining clean water. While the diffusion of chemical signals in the surrounding medium of biological systems has been heavily studied, the role of such processes is not fully understood in certain bacterial interactions. Furthermore, the electron transfer mechanism occurring in living cells and its role in cell-cell interaction is less understood. In this invited talk, two bacterial network case studies are examined: electron transfer in bacterial filaments (multi-hopped bacterial networks) and the inducement of quorum sensing in homogeneous populations (multi-terminal bacterial networks). Queueing theory is shown to be a simple, yet powerful method by which such systems can be modeled. The queueing theoretic models further suggest biologically relevant channel models for information theoretic analysis of larger systems. The eventual goal is to couple modeling with experiment to optimize the design of microbial systems whether that be fuel cells or preventing infection.

Monday, October 5th, 13:30 – 14:30, SALON DES SAISONS A

Addressing Spectrum Scarcity through Optical Wireless Communications (twinned with WOS #03)

Mohamed-Slim Alouini, Professor, KAUST, Saudi Arabia

Rapid increase in the use of wireless services over the last two decades has led to the problem of the radio-frequency (RF) spectrum exhaustion. More specifically, due to this RF spectrum scarcity, additional RF bandwidth allocation, as utilized in the recent past, is not anymore a viable solution to fulfill the demand for more wireless applications and higher data rates. The talk goes first over the potential offered by optical wireless communications to relieve spectrum scarcity. It then summarizes some of the challenges that need to be surpassed before such kind of systems can be massively deployed. Finally the talk offers an overview of some of the recent results for the determination of the capacity of optical wireless channels.

TUTORIALS

Sunday, October 4th, 9:00 – 10:30 / 11:00 – 12:30, SALON DES SAISONS B

Stochastic Geometry Modeling of Ultra-Dense Heterogeneous Cellular Networks: Simulation, Performance Evaluation, and Experimental Validation

Presenter:

- *Marco Di Renzo, Professor, CNRS-Supelec, France*

The fifth-generation (5G) is coming. Quo vadis 5G? What architectures, network topologies and technologies will define 5G? Are methodologies to the analysis, design and optimization of current cellular networks still applicable to 5G? The proposed tutorial is intended to offer a comprehensive and in depth crash course to communication professionals and academics. It is aimed to critically illustrate and discuss essential and enabling transmission technologies, communication protocols and architectures that are expected to make 5G wireless communication networks a reality. More specifically, the present tutorial is focused on illustrating the critical and essential importance of spatial models for an accurate system-level analysis and optimization of 5G networks, which are expected to use different frequency bands compared to state-of-the-art networks and to rely on a much denser deployment of access points and antenna-elements, to a scale that has never been observed in the past.

Sunday, October 4th, 9:00 – 10:30 / 11:00 – 12:30, SALON ÉTÉ

Dedicated Short Range Vehicular Communications: Overview, Technical Challenges, and Applications

Presenters:

- *John B. Kenney, Director and Principal Researcher, Toyota InfoTechnology Center, USA*
- *Gaurav Bansal, Senior Researcher, Toyota InfoTechnology Center, USA*

In this tutorial we cover the most important aspects of Dedicated Short Range Communications (DSRC), also known as Cooperative ITS. This technology is in the early stages of deployment in North America, Europe, and other regions. The US DOT plans to require DSRC in new vehicles in the coming years. DSRC is used to communicate vehicle-to-vehicle (V2V) and vehicle-to/from-infrastructure (V2I), enabling a set of compelling safety, mobility, automated driving, and environmental applications. This tutorial focuses on the safety and automated driving use cases. We explain the DSRC protocol stack, collision avoidance applications, and technical challenges for deployment. We discuss large-scale field tests and early deployment projects in the US, Europe, and Japan, e.g. the US Safety Pilot and the Rotterdam-Vienna Corridor Project. After presenting DSRC basics, we focus on a specific research problem that is currently of great interest: DSRC Channel Congestion. We discuss the merits of various approaches to address congestion, including avoidance and active control, as well as control modalities (message rate, transmit power, etc.). As a case study we present our specific research on adaptive message rate control, which is under consideration for standardization in the US and Europe. We end the tutorial with a discussion of the role DSRC can play in support of automated vehicles, including a framework for communicating dynamic road conditions to nearby vehicles. The primary goal of the tutorial is to empower the attendee to participate in this important emerging technology, whether as a researcher, a developer, or a planner.

Sunday, October 4th, 14:00 – 15:30 / 16:00 – 17:30, SALON DES SAISONS B

Emerging Green Technologies for 5G Wireless Networks: From Theory to Practice

Presenters:

- *Muhammad Zeeshan Shakir, Assistant Research Scientist, Texas A&M University at Qatar, Qatar*
- *Mohamed-Slim Alouini, Professor, KAUST, Saudi Arabia*
- *Xianbin Wang, Professor, University of Western Ontario, Canada*

This tutorial focuses on the emerging research topic “green (energy efficient) technologies for 5G wireless networks” that has drawn huge attention recently from both academia and industry. This topic is highly motivated due to important environmental, financial, and quality-of-experience (QoE) considerations. In literature, various solutions have been proposed to enable efficient energy usage in wireless networks, and these approaches are referred to as green technologies for wireless communications and networking. Heterogeneous small-cell networks

(HetNets) are considered as a striking solution to the challenging demands such as high spectral and energy efficiency of mobile communications networks. In this tutorial, we will first investigate and study the spectral and energy aware deployment of small-cells in HetNet and their several practical deployments around the edge of the cell such that the small-cell base stations (SBSs) serve the cell-edge mobile users, thereby expanding the network coverage and capacity. Efficient and satisfactory operation of all these densely deployed small-cells hinges on a suitable backhaul and fronthaul provisioning. Hence, there are considerable market interests on the development of innovative and Green backhaul and fronthaul solutions for ultra-dense HetNets. The hybrid free-space optical and radio frequency (FSO/RF) systems are considered as a potential candidate to enable high capacity and energy-efficient wireless backhauling. Therefore, this tutorial further targets to present an extensive overview of Green wireless backhaul solutions and their deployment implications in dense HetNet. The main goal of this tutorial is to promote Green technologies across the wireless networks through deploying small-cell technology, employing power control mechanisms, integrating new device centric communication paradigms such as D2D communications, and backhauling over Green technologies such as FSO. Simulation results will be presented to demonstrate the spectral and energy efficiency improvements in comparison to existing and other traditional technologies. Specifically, this tutorial will provide answers for the following:

- What are the Green competitive technologies to expand the cellular coverage (small cell technology, D2D, DSA, etc.?
- What are the emerging Green backhauling technologies in HetNet (hybrid FSO/RF approaches)?
- What are the ecological (carbon footprint) and economic (low carbon economy index) impacts of the future generations of wireless networks?

Sunday, October 4th, 14:00 – 15:30 / 16:00 – 17:30, SALON ÉTÉ

Communication Architectures and Networking for Electric Vehicles in the Smart Grid

Presenters:

- *Hussein Mouftah, Professor, University of Ottawa, Canada*
- *Melike Erol-Kantarci, Assistant Professor, Clarkson University, USA*

Worldwide electric vehicle sales are expected to be over 3.5 million annually by 2020 according to a Forbes forecast. A significant portion of those vehicles will be Plug-in Electric Vehicles (PEVs) that are plugged-in to the grid through a standard home outlet or to a charging station using a SAE J1772 connector. The volume of electric vehicle charging load is expected to be correlated with peak electricity usage which will dramatically impact the stability of the already stressed power grid. A large number of recent studies have addressed the uncontrolled charging problem and came up with novel architectures, models and networks that allow controlling the heavy PEV loads. Meanwhile, electric vehicle batteries can be considered as Distributed Energy Resources (DERs) once several batteries are controlled as one by an aggregator. This is usually referred to as vehicle-to-grid (V2G) while charging is known as grid-to-vehicle (G2V). V2G applications are expected to be predominant in microgrids which are small scale power grids with the ability to connect and disconnect to the power grid and those that may span a residential home, a building or a neighborhood. In this tutorial we will first provide a comprehensive background on electric vehicles, batteries, electric vehicle supply equipment types, charging properties, in addition to fundamentals of operation of the generation, transmission and distribution in the smart grid. Then, we will lead the audience to the challenges of electric vehicle charging with in-depth presentation on its impacts on supply, ramping, renewable energy integration, regulation and distribution equipment (transformers, feeders, protection switches, etc.). Along with challenges, we will introduce the opportunities when charging occurs overnight and reduces start-up and ramping costs in the next morning and discuss the options of using electric vehicle batteries as a resource in the smart grid. Next, we will present the communication technologies and networks that are used for connecting electric vehicles to the smart grid communication networks. We will discuss both vehicle to charging station communications as well as charging station to smart grid communications and present wireless, powerline, Ethernet and optical-wireless solutions. The state-of-the-art research in architectures and analytical models for G2V and V2G applications will be introduced in detail in the following part of the tutorial. Aggregator architectures, queuing models, network calculus, optimization-based studies, algorithms and many other solutions from academia and industry will be introduced. As a natural extension of VANETs, Connected Electric Vehicles (CEVs) and adoption of VANET technologies in CEVs will be discussed thoroughly. Worldwide testbeds designed for evaluating advanced electric vehicle applications in microgrids and the smart grid will be introduced. Before closing, we will present open issues and future directions which will give valuable hints for the audience who are willing to pursue cutting-edge research in the electric vehicle and smart grid domains.

SPECIAL SESSIONS

Monday, October 5th, 13:30 – 14:00, SALON PRINTEMPS

Wireless Transceivers Intended for Healthcare Applications (SPS #01)

Organizer:

- *Mohamad Sawan, Professor, Polytechnique Montréal, and Director, ReSMiQ Research Centre, Canada*

It is estimated that more than 90% of consumed power in any medical device is due to the wireless building block. This topic is becoming a top-level priority in most wearable and implantable medical devices such as biosensors and bio-stimulators that have to deal wherever applied with exponentially increasing needs not only in addressing various medical diseases but also in discovering various unknown phenomena in neuroscience at various cell levels, particularly in areas of brain sciences and cognition as well as various neural pathologies. The recent development of wireless transceivers attracted the attention of researchers from numerous fields of interest in order to solve the complexity of building high-data-rate ultra-low power-systems desperately needed to wirelessly transmit data from point of care to various healthcare destinations.

Monday, October 5th, 9:00 – 10:30, SALON PRINTEMPS

Wireless Terahertz Communications (SPS #02)

Organizers:

- *Roberto Morandotti, Professor, INRS-EMT, Canada*
- *Anna Mazhorova, Research Fellow, INRS-EMT, Canada*

This special session seeks papers on foundational aspects of wireless terahertz communications, including advanced architectures to terahertz signal processing, terahertz waveguiding and modulation schemes, various advanced device design and development challenges, including also communication challenges such as propagation modeling, capacity analysis and other physical and link layer solutions, in the terahertz frequency range. In particular, with the recent explosion of mobile technologies, the demand for ultra-fast wireless communication systems is drastically increasing. Television broadcasts, GPS navigation, Bluetooth devices, smartphones and WiFi are all exploiting radio and microwave frequencies and as a consequence, no significant amount of free bandwidth remains available. Thus transition towards higher frequencies, namely the terahertz (THz) range, seems today inevitable. The advantage of exploiting the THz band for wireless applications compared to the more established microwave is straightforward: the data transfer rate through a given channel can be significantly improved by increasing the bandwidth, which can be effectively facilitated with increased carrier frequency. The goal of this special session is to bring together researchers and industrial players from all over the world to a roundtable discussion related to the newest and most exciting achievements in the development and applications of terahertz communication. The different topics will span from cutting edge THz generation/detection techniques, low-loss THz waveguiding, and new solutions for high-speed transceiver architectures to THz signal processing. This special session will outline the communication challenges in terms of channel modeling, physical and network layers functionalities for THz communication networks.

WORKSHOPS

Sunday, October 4th, 9:00 - 10:30 / 11:00 - 12:30, SALON PRINTEMPS

Broadband Wireless Communication between Computer Boards (Atto-Nets) (WOS #04)

Organizers:

- *Eduard Jorswieck, Professor, Technische Universität Dresden, Germany*
- *Gerhard Fettweis, Vodafone Chair Professor, Technische Universität Dresden, Germany*

Driven by the needs of future multi-processor server architectures that support flexible highly adaptive energy-efficient high-performance computing, the main challenge considered in this workshop is to design high-performance, rate-adaptive, and energy-efficient communication architectures between the individual processors on different boards. To enable high data rates of up to 100 Gbit/s, we consider carrier frequencies in the range of 180 GHz to 300 GHz and a transmission bandwidth of 30 GHz. Such high carrier frequencies pose many challenging technological problems across all levels of the transceiver design, ranging from the required semiconductor technology, over circuit design of the radio frequency front-end up to the digital baseband. The high carrier frequency poses challenging requirements for the underlying process technology as operating frequencies up to 300 GHz are required. The design of the radio front-end is challenging due to the high carrier frequency as well as due to the required energy efficiency. Quantization with low bit rates, low latency channel coding, and analog beamforming are concepts relevant to the physical layer design. In the higher-level communication architecture, compute nodes are assumed to consist of 3D stacked processor chips with thousands of cores and local memory offering massive intra-node parallelism. This leads to multi-flow multi-hop concurrent communication within the computing platform and to several interesting design challenges regarding forward, routing, network coding, and many more. The workshop will bring together academic researchers and industrial professionals to identify and discuss technical challenges and recent results related to Broadband Wireless Communication between Computer Boards. Position papers, technology overviews, and case studies are also welcome.

Sunday, October 4th, 14:00 - 15:30, SALON PRINTEMPS

V2X Communications: Safety, Automated Driving, and Other Applications (WOS #05)

Organizers:

- *Gaurav Bansal, Senior Researcher, Toyota InfoTechnology Center USA, USA*
- *Yaser Fallah, Assistant Professor, West Virginia University, USA*

V2X communications will play an important role in Intelligent Transportation Systems. As V2X communications is coming close to deployment in North America, Europe, and Japan, the applications that it can support are evolving beyond safety to automated driving, intelligent intersections, and so on. To enable these new applications, there would be a requirement of high-throughput low-latency communications that can support the transfer of huge amount of sensor signals and other data between vehicles with a very low delay. This is a challenging task since it involves work in various aspects of vehicular channel models, PHY, and MAC layer innovations, congestion management, security issues, and efficient algorithms to share data between various vehicles, etc. The aim of the workshop is to bring together academic and industry researchers working in this fields and share their results and insights. In addition to technical papers, surveys, position papers and case studies are also welcome.

Tuesday, October 6th, 13:30 – 15:00, SALON PRINTEMPS

Fiber-Wireless (FiWi) Access Networks (WOS #03)

Organizer:

- *Martin Maier, Professor, INRS-EMT, Canada*

Mobile network operators and service providers are faced with the prospect of mobile data delivery costs outweighing revenues. In their quest for a ubiquitous ultra-high bandwidth communication infrastructure towards 5G, the backhaul is becoming a major performance-limiting factor and thus a pressing concern in mobile networks. In the past, most 4G LTE network research has been focusing on the achievable performance gains in the wireless front-end only without looking into the details of backhaul implementations and possible backhaul bottlenecks. It is only recently that

backhaul-aware 4G studies have begun to take capacity-limited backhaul links, as found in many of today's existing systems, into account and investigated the performance-limiting impact and details of different backhaul technologies. To cope with the unprecedented growth of mobile data traffic driven by the popularity of smart phones and mobile-connected tablets running diverse data-centric applications, the removal of the traditional barriers between coverage-centric 4G mobile networks and capacity-centric fiber-wireless (FiWi) broadband access networks based on low-cost data-centric Ethernet technologies represents one of several promising approaches to benefit from fiber backhaul sharing and WiFi offloading capabilities in unified cellular and FiWi broadband access networks.

Wednesday, October 7th, 9:30 – 11:00, SALON DES PRINTEMPS

Communications with Energy Harvesting and Wireless Power Transfer (WOS #06)

Organizers:

- *Kaibin Huang, Professor, The University of Hong Kong, China*
- *Caijun Zhong, Associate Professor, Zhejiang University, China*

With billions of mobile devices to be deployed in near term, extending the battery lives of these devices has emerged to a key challenge for designing mobile communication networks. Perhaps the most promising solutions are to harvest energy from the ambient environment or dedicated power sources, namely wireless power transfer (WPT). Recently, researchers have recognized that energy harvesting communications have brought many new research opportunities in communications, networking and signal processing and require revamping of communication theory. In particular, communication techniques, networking protocols and transceiver architectures need be redesigned to cope with energy intermittency, ensure high WPT efficiency and support simultaneous of information and power transfer. The goal of the workshop is to bring together the latest research results on these topics and also stimulate further research interest in the community in these exciting new directions. The scope of the proposed special issue will encompass communications, networking and signal processing aspects of energy harvesting and wireless power transfer in wireless communication networks.

Wednesday, October 7th, 10:00 – 11:00 / 11:30 – 12:30, SALON DES SAISONS B

Communications in Underground and Confined Environments (WOS #01)

Organizer:

- *Paul Fortier, Professor, Université Laval, Canada*

Truly ubiquitous wireless communications are often described as the next telecom frontier. As such, in-building environments have received huge attention for this purpose but other peculiar environments present significant opportunities and specific niche vertical markets for the wireless industry. This workshop is a forum for academic researchers, professionals and industrial specialists that are interested in or have realized original research, innovative applications, or field trials related to telecommunications in a confined area (basement, vehicle) or an underground environment (e.g., underground city, tunnels, subway, mine, shelter).

Wednesday, October 7th, 10:30 – 12:30, SALON PRINTEMPS

Challenges of Millimeter Wave Spectrum (Above 10GHz) in Next Generation (5G) Wireless Networks (WOS #02)

Organizers:

- *Vincent Roy, Director, Wireless Systems Incubation, InterDigital, Canada*
- *Ravi Pragada, Principal Engineer, Wireless Systems Incubation, InterDigital, USA*

This workshop seeks technical papers describing challenges, measurements and modeling, system architecture, design & development, and recent results in the field of millimeter wave communications for cellular and Wi-Fi systems. The demand for wireless data has been driving network capacity to double about every two years for at least the last 50 years and has come to be known as Cooper's Law. This trend is expected to continue for at least the next decade and has even accelerated in recent years as a greater proportion of the population adopts wireless devices with ever-greater capabilities such as tablets supporting HD video. The cellular systems industry is struggling to keep up with year over

year increase in data capacity demands and globally facing shortage of spectrum. Millimeter wave (mmW) frequencies are considered to be indispensable for next generation wireless systems, both cellular and Wi-Fi, primarily due to the large amounts of spectrum available in these bands. It is interesting to note that the available spectrum at these frequencies can be 200 times greater than all cellular allocations today under 3 GHz. The huge bandwidths available and high directivity of antennas at millimeter wave frequencies offer the potential for greatly increasing network capacity without cell sizes becoming impractically small, but this spectrum also offers significant challenges for radio network planners and modem designers. In spite of these challenges, mmW communication has emerged as a promising component of 5G cellular systems. It is second in the list of five disruptive technologies for 5G, one of the six vertical pillars in 5GPPP framework towards H2020 with significant interest from industry and academia. This interest is spurred by recent research and development efforts driven by new and encouraging mmW channel measurement results as well as encouraging progress in the antenna, silicon and system architecture domains. Moreover, recent supportive actions by the world leading regulatory bodies, e.g., FCC, ECC, and their Asian counterparts on allowing additional mmW frequency availability has further solidified the role of mmW in 5G systems. The unique characteristics of mmW bands in terms of signal propagation and the hardware and antenna requirements require fundamentally novel and thorough engineering approaches which will need to span a wide range of concepts from RF design to new network architectures. In this workshop, we examine the role that mmW communication could play in next generation cellular and Wi-Fi networks. This workshop will bring together academic researchers and industrial professionals to identify and discuss technical challenges and recent results related to mmW in enabling next generation wireless networks. Position papers, technology overviews, and case studies are also welcome.

Wednesday, October 7th, 11:30 – 13:00 / 14:30 – 16:00 / 16:30 – 18:00, SALON DES PRINTEMPS

Next Generation of Green ICT and 5G Networking (GreeNets) (WOS #07)

Organizers:

- *Osama Amin, Research Fellow, KAUST, Saudi Arabia*
- *Muhammad Zeeshan Shakir, Assistant Research Scientist, Texas A&M University at Qatar, Qatar*
- *Mohamed-Slim Alouini, Professor, KAUST, Saudi Arabia*

Wireless networks are rapidly becoming the most popular way of connecting to broadband through home and mobile devices. The resulting customer demand for ubiquitous network access and wireless services is mainly responsible for increased energy consumption and consequently for the growing carbon footprint of the mobile communications industry. The Information and Communication Technology (ICT) sector and the mobile communications industry have been estimated to jointly represent around 2% of global CO2 emissions. Even with the technological advancements in the ICT infrastructure, 6-9% growth rate in CO2 emissions is expected every year till 2020 which shows a steep growing pattern over the last few years with the proliferation of smart phones, tablet computers, and other smart devices. The fundamental factors contributing to the overall global carbon footprint of mobile communications industry include production, operation, distribution and maintenance of the mobile communications networks, devices and services. Based on the listed facts and figures, it can be concluded that the ICT sector in general and mobile communication industry in particular are not exempted from reducing their carbon footprint and have a considerable potential to decrease global carbon footprint especially in developing and emerging economies. To fulfill the escalated customer demands, it is therefore essential to consider paradigm-shifting technologies to increase the spectral and energy efficiency of upcoming ICT and 5G wireless networks. The debut edition of this workshop, GreeNets 2015, organized in conjunction with the 2015 IEEE International Conference on Ubiquitous Wireless Broadband ICUWB in Montreal, Canada, will be a collection of outstanding technical research/position and industrial papers covering novel Green solutions and recent research results with wide range of ingredients within the 5G framework (with specific focus on Energy efficiency and low carbon emission technologies). The workshop will provide an opportunity for exchanging ideas and creating new space for innovative game-changing end-to-end Green solutions to the challenging problems of designing, monitoring and management of smart energy efficient communications systems for emerging applications and services in ICT. This workshop will examine the technical challenges, review the economic feasibility, and discuss possible paths to regulatory solutions for future Green ICT and networking.

TECHNICAL SESSIONS

Sunday, October 4th

09:00 - 10:30

WOS #04-1: Broadband Wireless Communication between Computer Boards I

Room: SALON PRINTEMPS

Chair: Meik Dörpinghaus (TU Dresden, Germany)

09:00 *Network Coding Parallelization Based on Matrix Operations for Multicore Architectures*
Simon Wunderlich and Juan A Cabrera (TU Dresden, Germany); Morten V. Pedersen (Aalborg University, Denmark); Frank H.P. Fitzek (Technische Universität Dresden & ComNets - Communication Networks Group, Germany)

09:22 *A Branch-and-Bound Algorithm for Discrete Receive Beamforming with Improved Bounds*
Johannes Israel, Andreas Fischer and John Martinovic (Technische Universität Dresden, Germany)

09:45 *Energy Models for Communication of Future Computing Platforms*
Elke Franz (Technische Universität Dresden, Germany); Stefan Pfennig (TU Dresden, Germany); Bho Matthiesen (Technische Universität Dresden, Germany); Christian Scheunert and Eduard Jorswieck (TU Dresden, Germany)

10:07 *Confidential Network Coding: Physical Layer vs. Network Layer*
Stefan Pfennig (TU Dresden, Germany); Elke Franz (Technische Universität Dresden, Germany); Johannes Richter (Dresden University of Technology, Germany); Christian Scheunert and Eduard Jorswieck (TU Dresden, Germany)

11:00 - 12:30

WOS #04-2: Broadband Wireless Communication between Computer Boards II

Room: SALON PRINTEMPS

Chair: Eduard Jorswieck (TU Dresden, Germany)

11:00 *Energy-Efficient Transceivers for Ultra-Highspeed Computer Board-to-Board Communication*
Michael Jenning (Dresden University of Technology, Germany); Bernhard Klein and Ronny Hahnel (Technische Universität Dresden, Germany); Dirk Plettemeier (Dresden University of Technology, Germany); David Fritsche and Gregor Tretter (Technische Universität Dresden, Germany); Corrado Carta (Dresden University of Technology, Germany); Frank Ellinger (Technische Universität Dresden, Germany); Tobias Nardmann (Dresden University of Technology, Germany); Michael Schroter (Technical University Dresden, Germany); Krzysztof Nieweglowski, Karlheinz Bock, Johannes Israel and Andreas Fischer (Technische Universität Dresden, Germany); Najeeb Ul Hassan (Dresden University of Technology, Germany); Lukas Landau (Technische Universität Dresden, Germany); Meik Dörpinghaus (TU Dresden, Germany); Gerhard P. Fettweis (Technische Universitaet Dresden, Germany)

11:18 *On-Chip Integrated Antennas for 200 GHz Applications*
Michael Jenning (Dresden University of Technology, Germany); Bernhard Klein and Ronny Hahnel (Technische Universität Dresden, Germany); Dirk Plettemeier (Dresden University of Technology, Germany)

11:36 *On-Chip Antenna Pattern Measurement Setup for 140 GHz to 220 GHz*
Bernhard Klein, Ronny Hahnel and Patrick Seiler (Technische Universität Dresden, Germany); Michael Jenning and Dirk Plettemeier (Dresden University of Technology, Germany)

11:54 *Communications Employing 1-Bit Quantization and Oversampling At the Receiver: Faster-than-Nyquist Signaling and Sequence Design*
Lukas Landau (Technische Universität Dresden, Germany); Meik Dörpinghaus (TU Dresden, Germany); Gerhard Fettweis (Technische Universität Dresden, Germany)

12:12 *Strong LOS MIMO for Short Range MmWave Communication - Towards 1 Tbps Wireless Data Bus*
Xiaohang Song, Lukas Landau, Johannes Israel and Gerhard Fettweis (Technische Universität Dresden, Germany)

14:30 - 16:00

WOS #05: V2X Communications: Safety, Automated Driving, and Other Applications

Room: SALON PRINTEMPS

Chair: Yaser P. Fallah (West Virginia University, USA)

14:30 *Utilizing Situational Awareness for Efficient Control of Powertrain in Parallel Hybrid Electric Vehicles*
Hadi Kazemi, Behnam Khaki, Yaser P. Fallah, Andrew Nix and Scott Wayne (West Virginia University, USA)

14:52 *High Speed Multi-hop Data Dissemination for Heterogeneous Transmission Ranges in VANETs*
Maryam M. Alotaibi and Hussein Mouftah (University of Ottawa, Canada)

15:15 *A Cooperative Detection Model Based on Artificial Neural Network for VANET QoS-OLSR Protocol*
Amjad El Khatib and Azzam Mourad (Lebanese American University (LAU), Lebanon); Hadi Otrok (Khalifa University of Science, Technology & Research (KUSTAR), UAE); Omar Abdel Wahab and Jamal Bentahar (Concordia University, Canada)

15:37 *Range-Free Nodes Localization in Mobile Wireless Sensor Networks*
Slim Zaidi (University of Quebec, INRS-EMT, Canada); Ahmad El Assaf (INRS, Canada); Sofiene Affes (INRS-EMT, Canada); Nahi Kandil (Université du Québec en Abitibi-Temiscamingue, Canada)

TECHNICAL SESSIONS

Monday, October 5th

09:00 - 10:30

REG #01: Cooperative & Relayed Communication Techniques

Room: SALON DES SAISONS B

Chair: Hideki Ochiai (Yokohama National University, Japan)

09:00 *A New Transmission Protocol for Cooperative Communications*
Hua-An Zhao (Kumamoto Universy, Japan)

09:22 *A Survey on Cooperative Jamming Applied to Physical Layer Security*
Michael Atallah (ETS, Canada); Georges Kaddoum (ETS Engineering School, University of Québec, Canada); Long Kong (ETS & University of Quebec, Canada)

09:45 *Cooperative Group Key Generation Using IR-UWB Multipath Channels*
Iulia Tunaru, Benoit Denis and Regis Perrier (CEA-Leti Minatec, France); Bernard Uguen (University of Rennes I, France)

10:07 *Distributed Collaborative Beamforming Design in Scattered-Environments*
Slim Zaidi (University of Quebec, INRS-EMT, Canada); Sofiene Affes (INRS-EMT, Canada)
REG #02: Ranging, Imaging & Positioning I

REG #02: Ranging, Imaging & Positioning I

Room: SALON ÉTÉ

Chair: Georges Kaddoum (ETS Engineering School, University of Québec, Canada)

09:00 *3-dimensional Image Expansion Method by Incorporating RPM Imaging and Full Polarimetric Data for UWB Short Range Radar*
Ayumi Yamaryo and Shouhei Kidera (University of Electro-Communications, Japan); Tetsuo Kirimoto (The University of Electro-Communications, Japan)

09:22 *Modified Antipodal Vivaldi Antenna for Infrastructure Health Monitoring Techniques*
Zahra Esmati (Institute for Infrastructure Engineering, University of Western Sydney Penrith NSW, Australia); Sergey Kharkovsky (University of Western Sydney & UWS, Australia)

09:45 *Distributed DOA Estimation in Wireless Sensor Networks Using Randomized Gossip Method*
Li Zhang, Ning Xie and Hui Wang (Shenzhen University, P.R. China)

10:07 *Estimation of Angular Spreads and Mean Angles of Arrival for Multiple Incoherently-Distributed Noncircular Sources*
Sonia Ben Hassen (Tunisia Polytechnic School & Tunisia, Tunisia); Faouzi Bellili (INRS, Canada); Abdelaziz Samet and Sofiene Affes (INRS-EMT, Canada)

09:00 - 10:30

SPS #02: Wireless Terahertz Communications

Room: SALON PRINTEMPS

Chair: Anna Mazhorova (INRS, Canada)

09:00 *Parallel RS Error Correction Structures Dedicated for 100 Gbps Wireless Data Link Layer*
Lukasz Lopacinski and Jörg Nolte (BTU Cottbus, Germany); Steffen Büchner (Brandenburgische Technische Universität Cottbus-Senftenberg, Germany); Marcin Brzozowski (IHP, Germany); Rolf Kraemer (IHP Microelectronics, Frankfurt/Oder, Germany)

09:18 *Towards 100 Gbps Wireless Communication in THz Band with PSSS Modulation: A Promising Hardware in the Loop Experiment*
Karthik KrishneGowda (BTU Cottbus & IHP Microelectronics, Germany); Tobias Messinger (University of Stuttgart, Germany); Andreas Wolf (DWW, Germany); Rolf Kraemer (IHP Microelectronics, Frankfurt/Oder, Germany); Ingmar Kallfass (University of Stuttgart, Germany); Christoph Scheytt (University of Paderborn, Germany)

09:36 *Dispersion Compensation in the Fiber-Based Terahertz Communication Links*
Tian Ma and Maksim Skorobogatiy (Ecole Polytechnique de Montreal, Canada)

09:54 *Micro-slit Based Coherent Detection of Terahertz Pulses in Biased, Solid State Media*
Anna Mazhorova (INRS, Canada); Sze-Phing Ho (Nanophotonics Research Alliance, Universiti Teknologi Malaysia, Malaysia); Matteo Clerici (Heriot-Watt University, Canada); Marco Peccianti (University of Sussex, Canada); Alessia Pasquazi (University of Sussex, United Kingdom); Luca Razzari (INRS, Canada); Jalil Ali (Advanced Photonic Science Institute, Universiti Teknologi Malaysia, Malaysia); Roberto Morandotti (INRS-EMT, Canada)

10:12 *Visualization and Manipulation of Terahertz Light in the Near-Field*
François Blanchard (Ecole de Technologie Supérieure, Canada); Tomoki Hiraoka, Shuntaro Tani, Tomoko Tanaka, Takashi Arikawa and Koichiro Tanaka (Kyoto University, Japan)

11:00 - 12:30

REG #03: Sensor/RFID Systems & Networks

Room: SALON PRINTEMPS

Chair: Peng Hu (CMC Microsystems, Canada)

11:00 *High-Throughput and High-Efficiency Multiple Access Scheme for IEEE802.15.4 Based RFID Sensing*
Chuanying Zhai (The Royal Institute of Thechnology, Sweden); Zhuo Zou (KTH-The Royal Institute of Technology, Sweden); Qiang Chen (Royal Institute of Technology, Sweden); Li-Rong Zheng (Royal Institute of Technology (KTH), Sweden); Hannu Tenhunen (University of Turku, Finland)

11:22 *Low Complexity Burst Packet Detection for Wireless-Powered UWB RFID Systems*
Qin Zhou (KTH Royal Institute of Technology, Sweden); Zhuo Zou (KTH-The Royal Institute of Technology, Sweden); Hannu Tenhunen (University of Turku, Finland); Li-Rong Zheng (Royal Institute of Technology (KTH), Sweden)

11:45 *A System Architecture for the Software-Defined Industrial Internet of Things*
Peng Hu (CMC Microsystems, Canada)

12:07 *Light Weight Security Architecture for Cluster Based Wireless Sensor Networks*
Rajendiran Kishore (SSN College of Engineering, India); Aswin Chidambaram Pappa (Sri Sivasubramaniya Nadar College of Engineering, India); Iswarya Varshini S (SSN College of Engineering, India)

11:00 - 12:30

REG #04: Reconfigurable/Self-Adaptive Components & Devices

Room: SALON DES SAISONS B

Chair: Abdel Sebak (Concordia University, Canada)

11:00 *Polarization Reconfigurable Antennas Using Graphene for Microwave Applications*
Christian Nuñez Alvarez, Rebecca Cheung and John. S Thompson (University of Edinburgh, United Kingdom)

11:22 *Switchable Single-Slot Ring Frequency Selective Surface*
Suhair Mahmood and Tayeb A. Denidni (INRS-EMT, Canada)

11:45 *A Fully Differential 7.2-8.5GHz LNA for a Self Synchronized and Duty-cycled UWB OOK Receiver*
Ines Benamor and Ndiogou Tall (IM2NP, France); Nicolas Dehaese (University of Aix-Marseille III, France); Jean Gaubert and Sylvain Bourdel (L2MP, France); Remy Vauche (Aix-Marseille University, IM2NP, France); Oswaldo Ramos Sparrow and Stephane Meillère (IM2NP, France)

12:07 *Neural Network Based Linearization of RF Power Amplifiers Using In-Situ Device Temperature*
Patrick Jueschke (Alcatel-Lucent, Bell Labs, Germany); Georg Fischer (University of Erlangen-Nuremberg, Germany)

REG #05: Modulation, Detection & Coding

Room: SALON ÉTÉ

Chair: Abbas Yongacoglu (University of Ottawa, Canada)

11:00 *Improvement of L1 Signaling Performance for DVB-T2 Using Optimized Two-Dimensional Non-Uniform Constellations*
Carlos Barjau (Samsung Electronics, United Kingdom); Daniel Ansorregui (Samsung Electronics R&D UK, United Kingdom); Belkacem Mouhouche (Samsung Electronics Research and Development UK, United Kingdom); Hongsil Jeong and Hakju Lee (Samsung Electronics, Korea)

11:22 *Progress in Development of Differential Code Shift Reference Impulse Radio Ultra Wideband Transceiver*
Bhargava Sahukar (Dalhousie University, Canada); Hong Nie (University of Northern Iowa, USA); Zhizhang (David) Chen (Dalhousie University, Canada)

11:45 *Performance Comparison of Coded OFDM with DFT-Precoding Over Nonlinear Channels*
Yusaku Yamashita and Hideki Ochiai (Yokohama National University, Japan)

12:07 *Code-Aided Direction Finding in Turbo-Coded square-QAM Transmissions*
Faouzi Bellili and Chaima Elguet (INRS, Canada); Souheib Ben Amor and Sofiene Affes (INRS-EMT, Canada)

13:30 - 15:30

REG #06: RF Modules, Circuits & Systems I

Room: SALON DES SAISONS B

Chair: Abdelaziz Samet (INRS-EMT, Canada)

13:30 *Cost Efficiency Adaptive Antenna System Based on Active Frequency Selective Surface*
Fengchang Yu, Liang Zhang, Longfang Ye and Yanhui Liu (Xiamen University, P.R. China); Qing Huo Liu (Duke University, USA)

13:50 *Passive Reduced Order Macromodeling Based on Admittance Parameter Using Hamiltonian-Symplectic Matrix Pencil Perturbation*
Yi Qing Xiao (McGill University, Canada); Muhammad Kabir (MCGILL University, Canada); Marco Kassis and Roni Khazaka (McGill University, Canada)

14:10 *Ultra-narrow Linewidth and Highly Stable Laser for Radio Over Fiber Distributed Antenna Systems*
Mamoun Wahbeh (2500, Chemin Polytechnique & École Polytechnique de Montréal, Canada); Raman Kashyap (École Polytechnique de Montréal, Canada)

14:30 *A Ka Band Optically Transparent Reflectarray Design Integrated with Solar Cells*
Mohamed A. Moharram and Ahmed Kishk (Concordia University, Canada)

14:50 *Wireless LAN on 2-D Communication Tiles Using Ultra-Wideband as an Alternative Spectrum Resource*
Akihito Noda (The University of Tokyo, Japan); Hiroyuki Shinoda (University of Tokyo, Japan)

15:10 *Multiband Microstrip Antenna Design Using Harmonics Embedded Array of Composite Right / Left Handed Transmission Line (CRLH-TL)*
Yasser M. Madany (IEEE, Senior Member, Alexandria University, Egypt); Hassan El Kamchouchi and Bishoy Halim (Alexandria University, Egypt)

REG #07: Multiple/Radio Access & Interference Mitigation Techniques

Room: SALON ÉTÉ
Chair: Basile Landaabalo Agba (Institut de Recherche d'Hydro-Québec & École de technologie superieure, Canada)

13:30 *Mitigation of Impulsive Interference in Power Substation with Multi-Antenna Systems*
Ismail Ben Sik Ali (École de Technologie Supérieure, Canada); Minh Au (Ecole de Technologie Superieure, Canada); Basile Landaabalo Agba (Institut de Recherche d'Hydro-Québec & École de technologie superieure, Canada); Francois Gagnon (Ecole de Technologie Superieure, Canada)

13:50 *Combined Interference Cancellation and Avoidance Over the Downlink of Spectrum-Sharing LTE HetNet*
Raouia Nasri (Institut national de la recherche scientifique, Canada); Sofiene Affes (INRS-EMT, Canada); Alex Stéphenne (Ericsson & INRS-EMT, Canada)

14:10 *Improving the Bandwidth Efficiency of Multi-Terminal Satellite Communications*
Boulos Wadih Khoueiry (Concordia University, Canada); M. Reza Soleymani (Concordia Univerisity, Canada)

14:30 *Resource Allocation in Heterogeneous Small-Cell Networks with Interference Avoidance Admission*
Vahid Asghari (McGill University, Canada); Oussama Rhouma (INRS, University of Quebec, Canada); Sofiene Affes (INRS-EMT, Canada); Ali Ghrayeb (Texas A&M University at Qatar, Qatar)

14:50 *Reduced Complexity Iterative Beamforming for a Set of Virtual MIMO Devices*
Seyed Hossein Seyedmehdi (Ericsson Canada, Canada); Gary Boudreau (Ericsson, Canada)

15:10 *Performance of Cooperative MC-DS-CDMA System in the Presence of Interference Using Transmitter Preprocessing Based on CSI Feedback*
Nagaradjane Prabagarane (SSNCE, India); Tamilarasi Muthu (PEC, India)

SPS #01: Wireless Transceivers Intended for Healthcare Applications

Room: SALON PRINTEMPS
Chair: Mohamad Sawan (Polytechnique Montréal, Canada)

13:30 *Software Defined Radio Subsampling Receiver for Wireless Monitoring and Sensing Medical Applications*
Fadhel Ghannouchi and Andrew Kwan (University of Calgary, Canada)

13:50 *Low-Power Design Techniques for Rx RF Front-End*
Thierry Taris (university of bordeaux I, France); Amir Shirazi (UBC, Canada); Shahriar Mirabbasi (University of British Columbia, Canada)

14:10 *Integrated UWB Transmitter and Antenna Design for Interfacing High-Density Brain Microprobes*
Hadi Bahrami, Abdollah Mirbozorgi and Leslie Rusch (Université Laval, Canada); Benoit Gosselin (Laval University & Smart Biomedical Microsystems Lab, Canada)

14:30 *Emitters and Receivers for Impulse Radio Ultra-WideBand and Their Healthcare Applications*
Remy Vauche (Aix-Marseille University, IM2NP, France); Sylvain Bourdel (Grenoble Alpes Université, IMEP-LAHC, France); Jean Gaubert (IM2NP, France); Nicolas Dehaese (University of Aix-Marseille III, France); Herve Barthelemy (Toulon University, IM2NP, France)

14:50 *Sleep-Apnea Detection with UWB Active Sensors*
Giulia Fedele (Sapienza, University of Rome, Italy); Erika Pittella (University of Rome, Sapienza, Italy); Stefano Pisa and Marta Cavagnaro (Sapienza University of Rome, Italy); Raffaella Canali (Fondazione Don Carlo Gnocchi, Italy); Mauro Biagi (Università La Sapienza di Roma, Italy)

15:10 *Low-power, High-data Rate 915 MHz Transceiver with Fully Passive Wake-up Receiver for Biomedical Implants*
Mohamed Zgaren (Polytechnique Montreal, Canada); Arash Moradi (Ecole Polytechnique de Montreal, Canada); Guoxing Wang (Shanghai Jiao Tong University, P.R. China); Mohamad Sawan (Polytechnique Montréal, Canada)

Tuesday, October 6th

10:30 - 12:30

REG #08: Intelligent Transportation Systems (ITS) & Traffic Fluidity

Room: SALON DES SAISONS B

Chair: Hussein T Mouftah (University of Ottawa, Canada)

10:30 *Propagation Characteristics and Deployment of Millimeter Wave Communication in Bullet Train Car*
Feng Lu and Satoshi Imata (KDDI R&D Laboratories Inc., Japan); Naoyasu Kamiya (KDDI labs, Japan); Nobuo Suzuki (KDDI R&D Laboratories Inc., Japan); Kazunori Takeuchi (KDDI R&D Labs., Inc., Japan)

10:50 *Intra-Vehicular Path Loss Comparison of UWB Channel for 3-11 GHz and 55-65 GHz*
Jiri Blumenstein and Tomas Mikulasek (Brno University of Technology, Czech Republic); Ales Prokes (Brno University of Technology & Sensor, Information and Communication Systems Research Centre, Czech Republic); Thomas Zemen (AIT Austrian Institute of Technology GmbH & FTW Telecommunications Research Center Vienna, Austria); Christoph F Mecklenbräuker (Vienna University of Technology, Austria)

11:10 *A Generalized Framework for Quality of Experience (QoE)-based Provisioning in a Vehicular Cloud*
Moayad Aloqaily (University of Ottawa, Canada); Burak Kantarci (Clarkson University, USA); Hussein T Mouftah (University of Ottawa, Canada)

11:30 *Hybrid Relaying for Multi-hop Broadcast in VANETs*
Osama M. Hussain Rehman, Hadj Bourdoucen and Mohamed Ould-Khaoua (Sultan Qaboos University, Oman)

11:50 *Adaptive Service Time Control in Wireless Access for Vehicular Environment*
Yamen Nasrallah, Hussein T Mouftah and Irfan S. Al-Anbagi (University of Ottawa, Canada)

12:10 *Non-orthogonal Multicarrier Modulation for UWB Systems*
Marco Hernandez (NICT & Yokohama National University, Japan)

REG #09: Ranging, Imaging & Positioning II

Room: SALON ÉTÉ

Chair: Shouhei Kidera (University of Electro-Communications, Japan)

10:30 *Accurate 3-D Imaging Method Based on Range Points Migration for 140GHz-band Radar*
Yuta Sasaki (The University of Electro-Communications & Graduate School of Informatics and Engineering, Japan); Shouhei Kidera (University of Electro-Communications, Japan); Tetsuo Kirimoto (The University of Electro-Communications, Japan)

10:50 *Ultra-Wideband Radar Diffraction Approximation for Dielectric Edges*
Benedikt Friederich and Thorsten Schultze (Universität Duisburg-Essen, Germany); Ingolf Willms (University Duisburg-Essen, Germany)

11:10 *Design of Ultra-Wideband Antipodal Vivaldi Antenna for Microwave Imaging Applications*
Mahdi Moosazadeh (Institute for Infrastructure Engineering, University of Western Sydney, Australia); Sergey Kharkovsky (University of Western Sydney & UWS, Australia)

11:30 *Accurate Nodes Localization in Anisotropic Wireless Sensor Networks*
Ahmad El Assaf (INRS, Canada); Slim Zaidi (University of Quebec, INRS-EMT, Canada); Sofiene Affes (INRS-EMT, Canada); Nahi Kandil (Université du Québec en Abitibi-Temiscamingue, Canada)

11:50 *Very Wide Range Frequency Synthesizer Architecture for Avionic SDR Applications*
Zakaria El Alaoui Ismaili (Ecole de Technologie Supérieure, Canada); Wessam Ajib (Université du Québec à Montréal, Canada); Francois Gagnon (Ecole de Technologie Superieure, Canada); Frederic Nabki (Université du Québec à Montréal, Canada)

12:10 *Implementation of a Maximum Likelihood Doppler Spread Estimator on a Model-Based Design Platform*
Adel Ati and Faouzi Bellili (INRS, Canada); Haithem Haggui (Institut National de la Recherche Scientifique, Canada); Abdelaziz Samet and Sofiene Affes (INRS-EMT, Canada)

WOS #02: Challenges of Millimeter Wave Spectrum (Above 10GHz) in Next Generation (5G) Wireless Networks

Room: SALON PRINTEMPS

Chair: Vincent Roy (InterDigital Communications Corp., Canada)

10:30 *Accurate Stochastic Geometry Modeling and Analysis of mmWave Cellular Networks*
Wei Lu (L2S UMR 8506 & CNRS - Supélec - Université paris Sud 11, France); Marco Di Renzo (French National Center for Scientific Research (CNRS), France)

10:47 *Adaptive and Spatial Processing for Millimeter Wave Backhaul Architectures*
Isabelle Siaud (Orange Labs, Reseach and Development, Access Networks, France); Anne-Marie Ulmer-Moll (Orange Labs, France); Marc-Antoine Bouzigues (La Roche-sur-Yon Agglomération, France); Nicolas Cassiau (CEA-Leti Minatec, France)

11:04 *Mm Wave Initial Cell Search Analysis Under UE Rotational Motion*
Steven Ferrante (Interdigital Communications, USA); Tao Deng (Interdigital, USA); Ravikumar Pragada (InterDigital, USA); Daniel Cohen (Interdigital, USA)

11:21 *A Dual-hop Backhaul Network Architecture for 5G Ultra-Small Cells Using Millimetre-Wave*
Aftab Ahmed and David Grace (University of York, United Kingdom)

11:38 *A Wideband Millimeter-Wave Up-Conversion Mixer for Future Backhaul E-Band Point-To-Point Links with a 0dBm 1-dB Compression Point*
David del Río (CEIT and TECNUN, Spain); Ainhoa Rezola (University of Navarra & Ceit, Spain); Roc Berenguer and Iñaki Gurutzeaga (CEIT and TECNUN, Spain); Igone Vélez (CEIT and TECNUN - University of Navarra, Spain); Juan F Sevillano (CEIT and TECNUN, Spain)

11:55 *Mitigation of Phase Noise and Phase Rotation in Single-Carrier Communication Systems Using Pilots and Smoothing Technique*
Zhilin Zhang (Samsung Research America, USA)

12:12 *Practical LOS MIMO Technique for Short-Range Millimeter-Wave Systems*
Alexander Maltsev (Intel Corporation & University of Nizhny Novgorod, Russia); Ali Sadri (Intel & President and Chairman of WiGig Alliance, USA); Carlos Cordeiro (Intel Corporation, USA); Andrey Pudeyev (Intel, Russia)

13:30 - 15:00

REG #10: Advanced Channel Estimation & Combining Techniques

Room: SALON DES SAISONS B

Chair: Wessam Ajib (Université du Québec à Montréal, Canada)

13:30 *Distributed Implementation of Collaborative Beamforming in Highly-Scattered Environments*
Slim Zaidi (University of Quebec, INRS-EMT, Canada); Bouthaina Hmidet (INRS, Canada); Sofiene Affes (INRS-EMT, Canada)

13:52 *A Novel Pilot Expansion Approach for MIMO Channel Estimation and Tracking*
Ming Fei Siyau (London South Bank University, United Kingdom); Tiancheng Li (Northwestern Polytechnical University & University of Salamanca, P.R. China); Javier Prieto (University of Salamanca, Spain); Juan Corchado (Universidad de Salamaca, Spain); Javier Bajo (University of Salamanca, Spain)

14:15 *Joint Adaptive Modulation and Combining for Hybrid FSO/RF Systems*
Tamer Rakia (University of Victoria & IEEE Student Member, Canada); Hong-Chuan Yang (University of Victoria, Canada); Fayez Gebali (The University of Victoria, Canada); Mohamed-Slim Alouini (King Abdullah University of Science and Technology (KAUST), Saudi Arabia)

14:37 *Efficient Semi-Blind Channel Estimators for SIMO Systems Suffering From Broadband RFI*
Tilahun Getu (École de Technologie Supérieure (ETS), Canada); Wessam Ajib (Université du Québec à Montréal, Canada); Omar Yeste (LASSENA Labs, Canada)

REG #11: Small Cells & Heterogeneous Networks (HetNet)

Room: SALON ÉTÉ

Chair: Marco Di Renzo (French National Center for Scientific Research (CNRS), France)

13:30 *A Context-Aware Cognitive SIMO DL Transceiver for LTE HetNet Enhanced Pico-Cell Range Expansion*
Imen Mrissa (INRS EMT & NSERC CREATE Research Training Programme PERSWADE, Canada); Faouzi Bellili (INRS, Canada); Sofiene Affes (INRS-EMT, Canada); Alex Stéphenne (Ericsson & INRS-EMT, Canada)

13:52 *Fair Load Balancing in Heterogeneous Cellular Networks*
Edenalisoa Rakotomanana (École de Technologie Supérieure, Canada); Francois Gagnon (Ecole de Technologie Superieure, Canada)

14:15 *Service Differentiation in Software Defined Virtual Heterogeneous Wireless Networks*
Mohammad-Moshiur Rahman (École de Technologie Supérieure, University of Quebec, Canada); Charles Despins (Prompt, Canada); Sofiene Affes (INRS-EMT, Canada)

14:37 *Mixed Spatial Traffic Modeling of Heterogeneous Cellular Networks*
Chao Li, Abbas Yongacoglu and Claude D'Amours (University of Ottawa, Canada)

WOS #03: Fiber-Wireless (FiWi) Access Networks

Room: SALON PRINTEMPS

Chair: Martin Maier (Institut National de la Recherche Scientifique (INRS), Canada)

13:30 *Toward an Optimized Servers Placement for Mobile Applications Offloading*
Amal Ellouze (Telecom Paristech, France)

13:52 *Optimization and Deployment of Survivable Fiber-Wireless (FiWi) Access Networks with Integrated Small Cell and WiFi*
Yinpeng Yu (The University of Melbourne, P.R. China); Chathurika Ranaweera (The University of Melbourne, Australia); Christina Lim (University of Melbourne, Australia); Elaine Wong (Dept of Electrical and Electronic Engineering & The University of Melbourne, Australia); Lei Guo and Yejun Liu (Northeastern University, P.R. China); Ampalavanapillai Nirmalathas (The University of Melbourne, Australia)

14:15 *Power-Saving Scheme for PON LTE-A Converged Networks Supporting M2M Communications*
Dung Pham Van, Bhaskar Prasad Rimal and Martin Maier (Institut National de la Recherche Scientifique (INRS), Canada)

14:37 *Context-Aware Cognitive SIMO Transceiver for Increased LTE-Downlink Link-Level Throughput*
Imen Mrissa (INRS & NSERC CREATE Research Training Programme PERSWADE, Canada); Faouzi Bellili (INRS, Canada); Sofiene Affes (INRS-EMT, Canada); Alex Stéphenne (Ericsson & INRS-EMT, Canada)

16:30 - 18:00

REG #12: Low-Power & Low-Cost Designs

Room: SALON DES SAISONS B

Chair: Mohammed AlShareef (King Abdulaziz City for Science and Technology, Saudi Arabia)

16:30 *SPDT Switch Using Both nMOS and pMOS Transistors for Improving Power Handling*
Jia-Shiang Fu (National Central University, Taiwan)

16:52 *Miniaturization of an UWB Dual-Polarized Antenna*
Nina Lorho, Guillaume Lirzin, Anne Chousseaud and Tchanguiz Razban (Universite de Nantes, France); Adonis Bikiny and Sebastien Lestieux (Thales Communications & Security, France)

17:15 *Design of a Chipless UWB RFID Tag Using CPW Circular Monopole Antennas and Multi-Resonators*
Muhammad Ashraf (KACST TIC in Radiofrequency and Photonics (RFTONICS) for the e-society, King Saud University, Saudi Arabia); Osama Haraz (KACST TIC in Radiofrequency and Photonics (RFTONICS) for the e-society, King Saud University, Egypt); Mohammed AlShareef (King Abdulaziz City for Science and Technology, Saudi Arabia); Hatim Behairy (King Abdulaziz City For Science and Technology, Saudi Arabia); Saleh A Alshebeili (King Saud University, Saudi Arabia)

17:37 *Efficiency of DC Combination of Rectified Waveforms in Energy Harvesting Systems*
Mahsa Foruhandeh and Sonia Aïssa (INRS, University of Quebec, Canada)

REG #13: RF Modules, Circuits & Systems II

Room: SALON ÉTÉ

Chair: Carlos E. Saavedra (Queen's University, Canada)

16:30 *A Linearity Enhancement Method for CMOS Mixers Using Digital Assist*
David Stewart and Carlos E. Saavedra (Queen's University, Canada)

16:52 *Multiple Model Linearization Solution for Cellular Base Station Power Amplifiers*
Francisca Adaramola, Thomas Kunz and Howard Schwartz (Carleton University, Canada)

17:15 *A 280ps - 7.5ns UWB Pulse Generator with Amplitude Compensation in 40 nm CMOS*
Bram Faes and Patrick Reynaert (KU Leuven, Belgium); Paul Leroux (Katholieke Hogeschool Kempen, Belgium)

17:37 *A CMOS Duty-Cycled Coherent RF Front-End IC for IR-UWB Systems*
Laurent Ouvry, Gilles Masson and Fredeic Hameau (CEA-Leti Minatec, France); Brice Gerbert Gaillard (Easii-IC, France); Benjamin Caillat (Dolphin Integration, France)

Wednesday, October 7th

09:30 - 11:00

REG #14: Ranging, Imaging & Positioning III

Room: SALON ÉTÉ

Chair: Faouzi Bellili (INRS, Canada)

09:30 *Experimental Study on Dielectric Constant and Boundary Estimation Method for Double-layered Dielectric Object for UWB Radars*
Takuya Niimi and Shouhei Kidera (University of Electro-Communications, Japan); Tetsuo Kirimoto (The University of Electro-Communications, Japan)

09:52 *A Novel Approach for Material Characterization Based on a Retroreflector Wide Band Transceiver Radar*
Benedikt Friederich and Thorsten Schultze (Universität Duisburg-Essen, Germany); Ingolf Willms (University Duisburg-Essen, Germany)

10:15 *Cramér-Rao Lower Bounds for Angular Parameters Estimates From Incoherently Distributed Signals Generated by Noncircular Sources*
Sonia Ben Hassen (Tunisia Polytechnic School & Tunisia, Tunisia); Faouzi Bellili (INRS, Canada); Abdelaziz Samet and Sofiene Affes (INRS-EMT, Canada)

10:37 *High Precision UWB-based 3D Localization for Medical Environment*
Danilo Briese (Otto von Guericke University Magdeburg & Siemens Healthcare, Germany); Holger Kunze (Siemens Healthcare GmbH, Germany); Georg Rose (OVGU, Germany)

WOS #06: Communications with Energy Harvesting and Wireless Power Transfer

Room: SALON PRINTEMPS

Chair: Muhammad Mahboob Ur Rahman (KTH, Sweden)

09:30 *Simultaneous Energy Harvesting and Sender-Node Authentication At a Receiver Node*
Muhammad Mahboob Ur Rahman (KTH, Sweden); Sanobia Kanwal (BZ University, Pakistan); James Gross (Royal Institute of Technology (KTH), Sweden)

09:52 *Simultaneous Wireless Information and Power Transfer in Multi-User Interference SISO System*
Lihua Li, Huizhong Wang and Zhi Wang (Beijing University of Posts and Telecommunications, P.R. China); Arogyaswami Paulraj (Stanford University, USA)

10:15 *Efficient Node Localization in Energy-Harvesting Wireless Sensor Networks*
Ahmad El Assaf (INRS, Canada); Slim Zaidi (University of Quebec, INRS-EMT, Canada); Sofiene Affes (INRS-EMT, Canada); Nahi Kandil (Université du Québec en Abitibi-Temiscamingue, Canada)

10:37 *A Statistical Analysis of RF-Energy Harvesting in Wireless Networks*
Ala Abu Alkheir, Irfan S. Al-Anbagi and Hussein T Mouftah (University of Ottawa, Canada)

10:00 - 11:00

WOS #01-1: Communications in Underground and Confined Environments

Room: SALON DES SAISONS B

Chair: Nahi Kandil (Université du Québec en Abitibi-Temiscamingue, Canada)

10:00 *Accurate Sensors Localization in Underground Mines or Tunnels*
Ahmad El Assaf (INRS, Canada); Slim Zaidi (University of Quebec, INRS-EMT, Canada); Sofiene Affes (INRS-EMT, Canada); Nahi Kandil (Université du Québec en Abitibi-Temiscamingue, Canada)

10:20 *Impact of Imperfect Channel Estimation Error and Jamming on the Performance of Decode-and-Forward Relaying*
Khaled Eshteiwi (University of ETS, Canada); Georges Kaddoum (ETS Engineering School, University of Québec, Canada); Francois Gagnon (Ecole de Technologie Superieure, Canada)

10:40 *Experimental Evaluation of an OFDM Millimeter Wave System in an Underground Mine Channel Based on the IEEE802.15.3c Standard*
Mohamad El Khaled (Laval, Canada); Paul Fortier (Laval University, Canada); Mohamed Lassaad Ammari (Université Laval, Canada)

11:30 - 13:00

REG #15: RF Filtering, Isolation & Suppression Techniques

Room: SALON ÉTÉ

Chair: Carlos E. Saavedra (Queen's University, Canada)

11:30 *A Novel Ultra-Wideband Bandpass Filter Based on Multiple-Mode Resonators with Defected Ground Structure*
Jinxin Li (UESTC, INRS, Canada); Jun Xu (University of Electronic Science and Techonology of China, P.R. China); Tayeb A. Denidni (INRS-EMT, Canada); Qingsheng Zeng (INRS, Canada)

11:52 *The Impact of Filtering Function on the Design of CMOS Ultrawide-band Filters*
Abdelhalim Saadi (Centre de Développement des Technologies Avancées & Université des Sciences et des Technologies Houari Boumediene, Algeria); Mustapha Yagoub (University of Ottawa, Canada); Rachida Touhami (USTHB University, Algeria); Abdelkader Taibi (Centre de Développement des Technologies Avancées, Algeria); Abdelhalim Slimane (CDTA, Algeria); Mohand Tahar Belaroussi (Centre de Développement des Technologies Avancées, Algeria)

12:15 *Improvement of Transmit-Receive Array Antenna Isolation by Employing Multilayer EBG Structure*
Reza Movahedinia (Concordia University, Montreal, Quebec H3G 1M8, Canada); Mahmoud Niroo jazi (Concordia University, Canada); Mohammad Akbari (Concordia University & Montreal, Canada); Abdel R. Sebak (Concordia University, Canada); Mohammad Reza Chaharmir (Communications Research Centre, Canada)

12:37 *Back Radiation Suppression for Substrate Integrated H-Plane Horn Antenna*
Nima Bayat-Makou and Ahmed Kishk (Concordia University, Canada)

11:30 - 12:30

WOS #01-2: Communications in Underground and Confined Environments

Room: SALON DES SAISONS B

Chair: Paul Fortier (Laval University, Canada)

11:30 *Experimental Results of Rician K-factor and Co-polarization Ratio of 60 GHz Wireless Channel in an Underground Mine Gallery*
Shah Ahsanuzzaman Md Tariq (Université de Montréal-École Polytechnique de Montréal & Poly-Grames Research Center, Canada); Charles Despins (Prompt, Canada); Sofiene Affes (INRS-EMT, Canada); Chahe Nerguizian (Ecole Polytechnique, Canada)

11:50 *Comparative Study on a 60 GHz Path Loss Channel Modeling in a Mine Environment Using Neural Networks*
Nour Zaarour (Université du Québec-INRS, Canada); Sofiene Affes (INRS-EMT, Canada); Nahi Kandil (Université du Québec en Abitibi-Temiscamingue, Canada); Nadir Hakem (Université du Québec en Abitibi Témiscamingue & LRTCS Research Laboratory Télébec in Underground Communications, Canada)

12:10 *Characterization of a NLOS Off-body Channel At 2.45 GHz Using Patch Antenna Inside a Mine*
Moulay El Azhari (UQO & UQAT, Canada); Mourad Nedil (UQAT, Canada); Larbi Talbi (University of Quebec - Outaouais, Canada); Ismail Ben Mabrouk (University Of Quebec In Outaouais, Canada)

11:30 - 13:00

WOS #07-1: Next Generation of Green ICT and 5G Networking (GreeNets)

Room: SALON PRINTEMPS
Chair: Ali Afana (Memorial University of Newfoundland, Canada)

11:30 *HetNet Cloud: Leveraging SDN & Cloud Computing for Wireless Access Virtualization*
Mohammad-Moshiur Rahman (École de Technologie Supérieure, University of Quebec, Canada); Charles Despins (Prompt, Canada); Sofiene Affes (INRS-EMT, Canada)

11:52 *5G Green Communications: C-RAN Provisioning of CoMP and Femtocells for Power Management*
Anwer Al-Dulaimi (University of Toronto, Canada); Alagan Anpalagan (Ryerson University, Canada); Mehdi Bennis (Centre of Wireless Communications, University of Oulu, Finland); Athanasios V. Vasilakos (National Technical University of Athens & Kuwait University, Greece)

12:15 *Energy-Efficient Resource Allocation in Multi-cell Virtualized Wireless Networks*
Rajesh Dawadi and Saeedeh Parsaeefard (McGill University, Canada); Mahsa Derakhshani (University of Toronto, Canada); Tho Le-Ngoc (McGill University, Canada)

12:37 *Energy-Efficient Robust Resource Provisioning in Virtualized Wireless Networks*
Vikas Jumba and Saeedeh Parsaeefard (McGill University, Canada); Mahsa Derakhshani (University of Toronto, Canada); Tho Le-Ngoc (McGill University, Canada)

14:30 - 16:00

REG #16: Slot Antenna Design Technologies

Room: SALON DES SAISONS B
Chair: Tayeb Denidni (INRS, Canada)

14:30 *Wideband Coplanar Waveguide-Fed Slot Antenna Array with Via-Wall Structure*
Mei Yang, Xiaoxing Yin and Shun Li Li (Southeast University, P.R. China); Hongxin Zhao (State Key Laboratory of Millimeter Waves, P.R. China)

14:52 *High Gain Substrate Integrated Waveguide Resonant Slot Antenna Array for MM-Wave Band Radio*
Javad Pourahmadazar (National Institute of Scientific Research (INRS), Canada); Tayeb A. Denidni (INRS-EMT, Canada)

15:15 *A 50-70 GHz SIW-Based Linearly Tapered Slot Antenna with Low Cross Polarization*
Issa Mohamed and Abdel R. Sebak (Concordia University, Canada)

15:37 *3-Element Sectorial Fermi Tapered Slot Antenna with Sin-Corrugation*
Sitsofe Dorvlo, Zouhair Briqech and Abdel R. Sebak (Concordia University, Canada)

REG #17: Cooperative & Relayed Communication Techniques II

Room: SALON ÉTÉ
Chair: Mohamed-Slim Alouini (King Abdullah University of Science and Technology (KAUST), Saudi Arabia)

14:30 *Outage Minimization for Asymmetric Bi-Directional Relaying with Individual Peak-Power Limits*
Xiaodong Ji, Zhihua Bao and Guoan Zhang (Nantong University, P.R. China); Jian-Feng Gu (Ecole Polytechnique de Montreal, Canada)

14:52 *Opportunistic Scheduling in Downlink Multiple-Antenna AF Interfered Networks*
Imene Trigui (INRS - Centre Energie, Materiaux et Telecommnunications, Canada); Imen Mechmeche and Sofiene Affes (INRS-EMT, Canada); Alex Stéphenne (Ericsson & INRS-EMT, Canada)

15:15 *Opportunistic Open-Access Marco-Femto Networks with Femto Base Station Selection*
Vahid Asghari (McGill University, Canada); Ali Ghrayeb (Texas A&M University at Qatar, Qatar); Sofiene Affes (INRS-EMT, Canada)

15:37 *Towards Efficient Message Dissemination in Cognitive Radio Ad Hoc Network*
Ala Abu Alkheir, Irfan S. Al-Anbagi and Hussein T Mouftah (University of Ottawa, Canada)

WOS #07-2: Next Generation of Green ICT and 5G Networking (GreeNets)

Room: SALON PRINTEMPS

Chair: Sang Wu Kim (Iowa State University, USA)

14:30 *Energy Efficient Quadrature Spatial Modulation MIMO Cognitive Radio Systems with Imperfect Channel Estimation*
Ali Afana (Memorial University of Newfoundland, Canada); Ibrahem E. Atawi (University of Tabuk, Saudi Arabia); Salama Said Ikki (Lakehead University & Electrical Engineering Department, Canada); Raed Mesleh (University of Tabuk, Saudi Arabia)

14:52 *Optimum Sensing Bandwidth for Energy-Efficient Cognitive Radio Communications*
Sang Wu Kim, Chenxuan Cui and Nathan Neihart (Iowa State University, USA)

15:15 *Machine-to-Machine Communications in Cognitive Cellular Systems*
Waleed Ejaz (Ryerson University, Canada); Mohamed Ibnkahla (Queen's University, Canada)

15:37 *A Context-Aware Cognitive SIMO DL Transceiver for LTE HetNet Power Efficiency and Throughput Enhancement*
Imen Mrissa (INRS EMT & NSERC CREATE Research Training Programme PERSWADE, Canada); Faouzi Bellili (INRS, Canada); Sofiene Affes (INRS-EMT, Canada); Alex Stéphenne (Ericsson & INRS-EMT, Canada)

16:30 - 18:00

REG #18: UWB Antenna Design Technologies

Room: SALON DES SAISONS B

Chair: Tayeb A. Denidni (INRS-EMT, Canada)

16:30 *Single-layer UWB FSS for Enhancing the Gain of UWB Monopole Antenna*
Rabia Yahya, Akira Nakamura and Makoto Itami (Tokyo University of Science, Japan)

16:52 *UWB Hexagonal Monopole Fractal Antenna with Additional Trapezoidal Elements*
Djelloul Aissaoui (National Institute of Scientific Research, Canada); Tayeb A. Denidni (INRS-EMT, Canada); Noureddine B. Hacen (Universite de Tlemcen, Canada)

17:15 *A New Antenna with Dual Band-Notched Function by Shorting Pin and S-shaped Coupling Element*
Mohammad Akbari (Concordia University & Montreal, Canada); Neda Rojhani (Young Researchers and Elite club, South Tehran Branch, Islamic Azad University, Iran); Saman Zarbakhsh (Concordia University, Canada); Reza Movahedinia (Concordia University, Montreal, Quebec H3G 1M8, Canada); Abdel R. Sebak (Concordia University, Canada); Vijay Devabhaktuni (The University of Toledo, USA)

17:37 *UWB Antenna with 3.5-/5.5-GHz Dual Band- Notched Characteristics Using Two Radiating Stubs*
Mohammad Akbari (Concordia University & Montreal, Canada); Neda Rojhani (Young Researchers and Elite club, South Tehran Branch, Islamic Azad University, Iran); Saman Zarbakhsh (Concordia University, Canada); Reza Movahedinia (Concordia University, Montreal, Quebec H3G 1M8, Canada); Abdel R. Sebak (Concordia University, Canada); Vijay Devabhaktuni (The University of Toledo, USA)

REG #19: Performance Analysis & Channel Characterization Under New Propagation Conditions

Room: SALON ÉTÉ

Chair: Imene Trigui (INRS - Centre Energie, Materiaux et Telecommnunications, Canada)

16:30 *On the Average Bit Error Rate and Average Channel Capacity Over Generalized Fading Channels*
Osamah S. Badarneh (University of Tabuk, Saudi Arabia); Kadoch Michel (ETS University of Quebec, Canada); Ibrahem E. Atawi (University of Tabuk, Saudi Arabia)

16:52 *On the Required Number of Antennas in a Point-to-Point Large-but-Finite MIMO System*
Behrooz Makki, Tommy Svensson and Thomas Eriksson (Chalmers University of Technology, Sweden); Mohamed-Slim Alouini (King Abdullah University of Science and Technology (KAUST), Saudi Arabia)

17:15 *Performance Comparison of Spatial Modulation Detectors Under Channel Impairments*
Ebrahim A. Soujeri (École de Technologie Supérieure, Canada); Georges Kaddoum (ETS Engineering School, University of Québec, Canada)

17:37 *Statistical Modeling of 60 GHz Wireless Channel in an Underground Mine Gallery*
Shah Ahsanuzzaman Md Tariq (Université de Montréal-École Polytechnique de Montréal & Poly-Grames Research Center, Canada); Charles Despins (Prompt, Canada); Sofiene Affes (INRS-EMT, Canada); Chahe Nerguizian (Ecole Polytechnique, Canada)

WOS #07-3: Next Generation of Green ICT and 5G Networking (GreeNets)

Room: SALON PRINTEMPS

Chair: Mohammad Asad Rehman Chaudhry (Soptimizer, Canada)

16:30 *Resource Allocation for Decode-and-Forward Relayed System with Interference Aided Energy Harvesting*
Imran Ahmed (Northern University Bangladesh, Bangladesh); Md. Jahangir Hossain (Universtiy of British Columbia, Okanagan, Canada); Imtiaz Ahmed (McGill University, Canada)

16:52 *On Energy-Efficient HARQ Schemes for M2M Communication*
Marco Centenaro (University of Padova, Italy); Giulio Ministeri (Università degli studi di Padova, Italy); Lorenzo Vangelista (University of Padova, Italy)

17:15 *Coordinated Energy Management for Emergency Demand Response in Mixed-Use Buildings*
Nguyen H. Tran and Chuan Pham (Kyung Hee University, Korea); Shaolei Ren (University of California, Riverside, USA); Choong Seon Hong (Kyung Hee University, Korea)

17:37 *A Set Cover Based Efficient Solution for the Complementary Index Coding Problem*
Zakia Asad (University of Toronto, Canada); Mohammad Asad Rehman Chaudhry (Soptimizer, Canada)

BIOGRAPHIES OF PROGRAM ORGANIZERS AND GUESTS

Ali Abedi, Professor, University of Maine, USA

Ali Abedi received his BSEE (1996) and MSEE (1998) from Sharif University of Technology and his Ph.D (2004) from University of Waterloo. He joined University of Maine in 2005, where he is currently Professor of Electrical and Computer Engineering, Director of Wireless Sensor Networks Laboratory, and Director of Center for Undergraduate Research at office of the Vice President for Research. He held visiting scholar appointments at the University of Maryland (2012) and NIST (2012-2013), and served as lecturer at the Air Force University (1998-2000), University of Waterloo (2003-2004), and Queen's University (2004-2005). Dr. Abedi's research in Wireless Communications area is focused on analytical performance evaluation of high performance channel codes, resource allocation in cognitive and cooperative networks, and applications of distributed coding in sensor networks for space and biomedical devices. He is co-founder of two start-up companies and has published over 80 conference proceedings papers and journals as well as 3 books and 2 book chapters. His recent research resulted in a wireless leak detection system that will be tested on International Space Station next year. Dr. Abedi is a Senior Member of IEEE and member of editorial board for IEEE/KICS Journal of Communications and Networks as well as IET Wireless Sensor Systems Journal.

François Adam, General Manager, Innovative Vehicle Institute, Canada

François Adam was the Director of ITAQ since 2012 before it merged with CNTA to become the Innovative Vehicle Institute (IVI). Throughout his career, he has been responsible for many developments in the field of transport electrification, including various electric vehicle prototypes: the Kargo, a small utility truck from Precicad, the Minautor, a 4x4 vehicle for mining industry from Pedno, and the Sora, a motorcycle from Lito Green Motion. François graduated in electrical engineering at the Université de Sherbrooke. He sits on the InnovÉÉ's Board of Directors and on the Transport Electrification Coordinating Committee chaired by the Pôle d'excellence québécois en transport terrestre.

Sofiène Affes, Professor, INRS-EMT, and Director, PERSWADE, Canada

Sofiène Affes received the Diplôme d'Ingénieur in telecommunications in 1992, and the Ph.D. degree with honors in signal processing in 1995, both from École Nationale Supérieure des Télécommunications (ENST), Paris, France. He has been since with INRS, Canada, as a Research Associate till 1997, an Assistant Professor till 2000, and Associate Professor till 2009. Currently he is Full Professor and Director of PERWADE, a unique 4M$ research training program on wireless in Canada involving 27 faculty from 8 universities and 10 industrial partners. Dr Affes has been twice the recipient of a Discovery Accelerator Supplement Award from NSERC, from 2008 to 2011, and from 2013 to 2016. From 2003 to 2013, he held a Canada Research Chair in Wireless Communications. In 2006, he served as a General Co-Chair of IEEE VTC'2006-Fall, Montreal, Canada. In 2008 he received from the IEEE Vehicular Technology Society the IEEE VTC Chair Recognition Award for exemplary contributions to the success of IEEE VTC. He currently acts as an Associate Editor for the IEEE Transactions on Communications and the Wiley Journal on Wireless Communications & Mobile Computing. He has been previously an Associate Editor for the IEEE Transactions on Wireless Communications and the IEEE Transactions on Signal Processing. He is currently serving as a General Chair of IEEE ICUWB 2015 in Montreal, Canada.

Mohamed-Slim Alouini, Professor, KAUST, Saudi Arabia

Mohamed-Slim Alouini (S'94, M'98, SM'03, F'09) was born in Tunis, Tunisia. He received the Ph.D. degree in Electrical Engineering from the California Institute of Technology (Caltech), Pasadena, CA, USA, in 1998. He served as a faculty member in the University of Minnesota, Minneapolis, MN, USA, then in the Texas A&M University at Qatar, Education City, Doha, Qatar before joining King Abdullah University of Science and Technology (KAUST), Thuwal, Makkah Province, Saudi Arabia as a Professor of Electrical Engineering in 2009. His current research interests include the modeling, design, and performance analysis of wireless communication systems.

Osama Amin, Research Fellow, KAUST, Saudi Arabia

Osama Amin received the Ph.D. degree in Electrical and Computer Engineering from the University of Waterloo, Waterloo, ON, Canada in 2010. In June 2012, he joined Assiut University, Assiut, Egypt, as an Assistant Professor in the Electrical and Electronics Engineering Department. Currently, he is a Research Fellow at King Abdullah University of Science and Technology (KAUST), Thuwal, Makkah, Kingdom of Saudi Arabia. His general research interests are in communications systems and signal processing for communications with special emphasis on wireless applications. Specific research areas include green communications, cognitive radio, cooperative communications, and impact of channels uncertainties on communication systems. He has served as a technical program committee (TPC) member for IEEE VTC, CrownCOM, PIMRC, and ISSPIT conferences.

Gaurav Bansal, Senior Researcher, Toyota InfoTechnology Center, USA

Gaurav Bansal received a B.Tech. degree from Indian Institute of Technology (IIT) Kanpur, India and a Ph.D. degree from the University of British Columbia (UBC), Canada. From August 2007 to July 2008, he worked as a Research Intern with Mercedes Benz Research and Development North America Inc., Palo Alto, CA. He joined Toyota InfoTechnology Center, USA, in July 2010 where he currently works as a Senior Researcher in the Network Group. He is a recipient of Natural Science Engineering and Research Council of Canada's Alexander Graham Bell Scholarship. He is Demonstrations Chair for the 2014 WiVEC Symposium, and has served as a TPC member for several international conferences including IEEE VTC Fall 2014, CSCITA-2014, COMSNETS 2014, and SmartVehicles '14. He also serves on the Editorial board of IEEE Communication Surveys and Tutorials.

Faouzi Bellili, Research Associate, INRS-EMT, and Project Coordinator, 5G-WAVES, Canada

Faouzi Bellili received the B.Eng. degree in signals and systems (with Hons.) from the Tunisia Polytechnic School in June 2007. He also received the M.Sc. and Ph.D. degrees (both with the highest honor) from the National Institute of Scientific Research (INRS-EMT), University of Quebec, Montreal, QC, Canada, in December 2009 and August 2014, respectively. He is currently working as a Research Associate at INRS-EMT and Coordinator for the 5G-WAVES NSERC/Huawei/ TELUS Collaborative R&D Project. He authored/co-authored over 40 peer-reviewed papers in reputable IEEE journals and conferences. His research focuses on statistical signal and array processing with an emphasis on parameter estimation for wireless communications. Dr. Bellili received the Academic Gold Medal of the Governor General of Canada for the year 2009-2010 and the Excellence Grant of the Director General of INRS for the year 2009-2010.

Alexia Bhéreur-Lagounaris, Researcher, INRS-UCS, and Coordinator, VESPA, Canada

Alexia Bhéreur-Lagounaris has a multidisciplinary path, from contemporary dance (Carbone 14, Joe de Jean-Pierre Perreault) to Artistic Scout for Cirque du Soleil, media research, digital social network use, and Event Curator. She joined the UCS Research Center of INRS (l'Institut national pour la recherche scientifique) for the VESPA lab (Ville et ESPAces politiques), directed by Julie-Anne Boudreau, to direct the multimedia aspect of research and curate scientific seminars. Her studies include a BA in Interactive Multimedia, and both her Master and ongoing research are on Social Impact Games. In September 2015, she was a guest speaker at the "Video-game Cultures: the Future of Interactive Entertainment", organized by the Interdisciplinary Global Network for Dynamic Research, Mansfield College, Oxford, United Kingdom.

Carlos Cordeiro, Principal Engineer, Platform Engineering, Intel, USA

Carlos Cordeiro is a Principal Engineer in the Platform Engineering Group within Intel Corporation. He leads Intel's engagement in the Wi-Fi Alliance and standards development for unlicensed millimeter frequencies. In the Wi-Fi Alliance, he is a member of the Board of Directors and serves as its Technical Advisor, in addition to chairing the technical task group on 60 GHz. He is a Senior Member of the IEEE and was the technical editor to both the IEEE 802.11ad standard and the Wireless Gigabit Alliance MAC/PHY specification. Due to his contributions to wireless communications, he received several awards including the prestigious Global Telecom Business 40 under 40 in 2012 and 2013, the IEEE Outstanding Engineer Award in 2011, and the IEEE New Face of Engineering Award in 2007. He is the co-author of two textbooks on wireless published in 2006 and 2011,

has published about 100 papers in the wireless area alone, and holds over 60 patents. He has served as Editor of various journals including the IEEE Journal on Selected Areas in Communications, the IEEE Transactions on Wireless Communications, the IEEE Wireless Communication Letters and the ACM Mobile Computing and Communications Review journal.

Yan Côté, Co-Founder and CTO, Vrvana, Canada

Yan Côté, graduated in electronic engineering, has been involved in different fields of industrial digital imaging, including product design and video industry standardization. Through his passion for VR/AR, artificial intelligence, 3D visualization, cyber security, and physics, he has been able to gain expertise in various topics including system architecture, electronic design, FPGA design, and software and image processing.

Denis Couillard, Director of Products Innovation, Ultra Electronics TCS, Canada

Denis Couillard has received his B. Eng. in Electrical Engineering and his Master in Technology Management from École Polytechnique de Montreal, Canada. He has 29 years' experience in the telecom industry where he helped launch several new radio communication technologies and products. He is the industrial lead of the Ultra TCS Research Chair on Tactical Communications at ETS University, has authored a book on strategic technology management and holds two US Patents on Electronic Attack and Protection. Denis is currently Director of Products Innovation at Ultra Electronics TCS in Montreal. Formerly known as the Canadian Marconi Company, Ultra has designed and deployed thousands of early cognitive radios in South-Korea and is known in North-America as the designer of the HCLOS SCA radio, the terrestrial backbone of US and Canadian Forces in the field.

Luc Courchene, Founding Member and Co-Director of Research, SAT, Canada

Luc Courchesne is a pioneer in media art and design. From interactive portraiture to immersive experience systems, he has developed innovative approaches which have earned him prestigious awards such as the Grand Prix of the ICC Biennale 1997 in Tokyo, an Award of Distinction and several Honorary Mentions at Prix Ars Electronica in Linz, Austria, an exhibition at the Museum of Modern Art in New York, and participations in Wired's Next Fest. His work is part of major public and private collections in North America, Europe and Asia including the ZKM (Karlsruhe), the ICC (Tokyo), and the National Gallery of Canada (Ottawa). Luc Courchesne [courchel.net] is a founding member and current Co-Director of Research at the Society for Art and Technology [sat.qc.ca] and Honorary Professor at Université de Montréal.

Charles Despins, President & CEO, Prompt, Canada

Charles Despins Ph.D., Eng., is President and CEO of Prompt inc., a university-industry research and development consortium in the information and communications technologies (ICT) sector. In addition to his academic postings (that he continues to hold) in the Université du Québec network, he has held various posts in the private sector, namely at CAE Electronics, Microcell (Canadian cellular operator) and at Bell Nordiq Group (a network operator in rural and northern areas of Canada) as vice-president and chief technology officer. He has also worked as a consultant for wireless network deployments in India and China. Dr. Despins is a Fellow (2005) of the Engineering Institute of Canada and a recipient (2006) of the Outstanding Engineer award from IEEE Canada. Following thirty years in the ICT sector, he is today a frequent advocate on Sustainable ICT issues.

Marco Di Renzo, Professor, CNRS-Supelec, France

Marco Di Renzo (S'05–AM'07–M'09–SM'14) was born in L'Aquila, Italy, in 1978. He received the Laurea (cum laude) and the Ph.D. degrees in Electrical and Information Engineering from the Department of Electrical and Information Engineering, University of L'Aquila, Italy, in April 2003 and in January 2007, respectively. In October 2013, he received the Habilitation à Diriger des Recherches (HDR) from the University Paris-Sud XI, Paris, France. Since January 2010, he has been a Tenured Associate Professor ("Chargé de Recherche Titulaire CNRS") with Paris-Saclay University in the Laboratory of Signals and Systems (L2S), a joint academic and research laboratory of CNRS, CentraleSupelec and University Paris-Sud XI, Paris, France. His main research

interests are in the field of wireless communications theory. He is a Principal Investigator of six European-funded research projects (Marie Curie ITN-GREENET, Marie Curie IAPP-WSN4QoL, Marie Curie ITN-CROSSFIRE, Marie Curie IAPP-SmartNRG, Marie Curie ITN-5Gwireless and Marie Curie RISE-CASPER). He is a co-founder and the Chief Scientific Officer for Wireless Communications Research of the university spinoff company WEST Aquila s.r.l.. From August 2002 to January 2008, he was with the Center of Excellence for Research DEWS, University of L'Aquila, Italy. In the fall of 2006, he was a Visiting Scholar in the Bradley Department of Electrical and Computer Engineering, Virginia Tech, USA. From February 2008 to April 2009, he was a tenured Research Associate with the Telecommunications Technological Center of Catalonia (CTTC), Spain. From May 2009 to December 2009, he was an EPSRC Research Fellow with the Institute for Digital Communications (IDCOM), The University of Edinburgh, United Kingdom. Dr. Di Renzo is the recipient of numerous scientific awards, currently serves as an Editor of the IEEE Communications Letters and of the IEEE Transactions on Communications (Heterogeneous Networks Modeling and Analysis).

Meik Dörpinghaus, Research Group Leader, Center for Advancing Electronics Dresden, Germany

Meik Dörpinghaus received the Dipl.-Ing. and the Dr.-Ing. degrees in Electrical Engineering and Information Technology both from RWTH Aachen University, Aachen, Germany, in 2003 and 2010, respectively. Before joining TU Dresden, he has been a postdoctoral researcher at RWTH Aachen University. In 2007, he was a visiting researcher at ETH Zurich, Switzerland. Since April 2013, he is a research group leader at the Vodafone Chair on Mobile Communications Systems and at CFAED (Center for Advancing Electronics Dresden). His research interests are in the area of communication and information theory.

Mathieu Dupont, CTO, Miralupa, Canada

Mathieu Dupont, with over 25 years of experience in software development and information technology, has developed a solid expertise in software architecture, systems development and integration, technological architecture, telecommunication and IT management. His career path revolved around small, medium, and large high-tech corporations in the fields of land registration, geomatics, air travel, telecommunication, and industrial control systems. He architected MARGE (Multiuser Augmented Reality Global Environment), Miralupa's proprietary augmented reality platform; and he currently manages all of Miralupa's research, development, and technological operations activities.

Marc Dupuis, Responsible for Policy Development and Engagement with Governments, OneWeb, Canada

Marc Dupuis is responsible for policy development and engagement with Governments for OneWeb, a company with a mission to bring affordable broadband Internet access to the world, notably to unconnected and underserved communities. One of its most ambitious goals is to connect all schools of the planet, so that no child is left without access to the incredible knowledge that is offered through this medium. OneWeb is a global communications company building a non-geostationary low-Earth-orbit constellation of over 700 satellites. In addition to providing high-speed broadband access, the network will extend mobile coverage, as each terminal is also a 3G/LTE base station and WiFi access point. Before joining OneWeb, Marc was Director General for the Spectrum Engineering Branch of Industry Canada, and spent one year at the Communications Research Centre. In his twelve years at Industry Canada, he directed the regulatory planning and engineering of the radio spectrum and telecommunication for the benefit of Canadians. Before accepting a position in the federal government, Marc worked eighteen years in the private sector, first with Telesat Canada and then as the Director of the Canadian office for Teledesic, a start-up satellite company. Mr. Dupuis obtained his B.A.Sc. (Electrical Engineering) with honours from the University of Ottawa in 1985.

Jaafar Elmirghani, Professor, University of Leeds, U.K.

Jaafar M. H. Elmirghani is the Director of the Institute of Integrated Information Systems within the School of Electronic and Electrical Engineering, University of Leeds, UK. He joined Leeds in 2007 and prior to that (2000–2007) as chair in optical communications at the University of Wales Swansea he founded, developed and directed the Institute of Advanced Telecommunications and the Technium Digital (TD), a technology incubator/spin-off hub. He received the Ph.D. from the University of Huddersfield UK in 1994 and the DSc in Communication Systems and Networks from University of Leeds, UK, in 2014. He

has co-authored Photonic switching Technology: Systems and Networks, (Wiley) and has published over 400 papers. He has research interests in optical systems and networks. He was Chairman of IEEE Comsoc Transmission Access and Optical Systems technical committee and was Chairman of IEEE Comsoc Signal Processing and Communications Electronics technical committee, and an editor of IEEE Communications Magazine. He was founding Chair of the Advanced Signal Processing for Communication Symposium which started at IEEE GLOBECOM'99 and has continued since at every ICC and GLOBECOM. Prof. Elmirghani was also founding Chair of the first IEEE ICC/GLOBECOM optical symposium at GLOBECOM'00, the Future Photonic Network Technologies, Architectures and Protocols Symposium. He was the founding chair of the first Green Track at ICC/GLOBECOM at GLOBECOM 2011. He received the IEEE Communications Society Hal Sobol award, the IEEE Comsoc Chapter Achievement award for excellence in chapter activities (both in 2005), the University of Wales Swansea Outstanding Research Achievement Award, 2006, the IEEE Communications Society Signal Processing and Communication Electronics outstanding service award, 2009 and a best paper award at IEEE ICC'2013 in Green Communications. He is currently an editor of IEEE Communications Surveys and Tutorials and IEEE Journal on Selected Areas in Communications series on Green Communications and Networking. He is Co-Chair of the GreenTouch Wired, Core and Access Networks Working Group and has been awarded in excess of £22 million in grants to date from EPSRC, the EU and industry and is an IEEE Comsoc Distinguished Lecturer 2013-2016.

Melike Erol-Kantarci, Assistant Professor, Clarkson University, USA

Melike Erol Kantarci is an assistant professor at the Department of Electrical and Computer Engineering at Clarkson University, Potsdam, NY. Previously, she was the coordinator of the Smart Grid Communications Lab and a postdoctoral fellow at the School of Electrical Engineering and Computer Science, University of Ottawa, Canada. She received the Ph.D. and M.Sc. degrees in Computer Engineering in 2009 and 2004, respectively. During her Ph.D. studies, she was a Fulbright visiting researcher at the Computer Science Department of the University of California Los Angeles (UCLA). She received the B.Sc. degree from the Department of Control and Computer Engineering at the Istanbul Technical University, in 2001. She has received a Fulbright PhD Research Scholarship (2006) and the Siemens Excellence Award (2004), and she has won two Outstanding/Best Paper Awards. She has delivered invited talks at various venues including Communications Research Center (CRC) of Canada, National Research Council (NRC) of Canada, IEEE Ottawa Chapter and Turkish Naval Research Center. She is an occasional reviewer of transactions and journals, and a TPC member for various conferences. Her main research interests are smart grid, cyber-physical systems, electrification of transportation, wireless sensor networks, underwater sensor networks, mobility modeling, localization and internet traffic analysis. She has over 1000 citations and her h-index is 19 according to Google Scholar. She is an editor of International Journal of Distributed Sensor Networks published by Hindawi. She is an IEEE member and the past vice chair for Women in Engineering (WIE) at the IEEE Ottawa Section.

Alexandre Fainberg, Co-Founder and COO, Heddoko, Canada

Alexandre Fainberg, also known as the "Money Man", is a business process re-engineering consultant and canny entrepreneur. He has worked over 19 years in the aerospace and defence, finance and banking, telecommunications, and retail industry with notable clients such as Bombardier Aerospace, National Bank of Canada, Rolls Royce, Videotron, and Cirque du Soleil. He has also participated in 5 different start-ups. His areas of expertise are strategic business modelling, sales and distribution, logistics and materials management. A full member of the Royal Aeronautical Society, he holds a bachelor in commerce (2000) and an MBA (2006) from the John Molson School of Business. He is a Level I candidate in the CFA Program and holds several certifications from software giant SAP AG. Once cited at the Bombardier Annual Achievement Award as an "advisor that makes things happen", Alexandre Fainberg has literally built his entire consulting career on that definition. Indefatigable in his work, very client-focused, and almost obsessive about the quality of his deliverables, Alexandre approaches each new business challenge with his intrinsic flair for innovation, creative problem-solving, and measured risk-taking to consistently steer bottom-line improvements and stakeholder returns.

Yaser Fallah, Assistant Professor, West Virginia University, USA

Yaser P. Fallah is an Assistant Professor and Director of the Cyber-Physical Systems (CPS) laboratory at West Virginia University, USA. He is a recipient of an NSF CAREER award and leads research activities in the areas of transportation CPS, wireless vehicular networks, automated vehicle safety and efficiency systems, and industrial networks. Yaser has served as program co-chair for 2011 and 2014 editions of IEEE International Symposium on Wireless Vehicular communications (WiVeC). He currently leads several connected vehicle research projects sponsored by automotive industry and US-DoT. Yaser received his PhD from the University of British Columbia in 2007 and was an NSERC postdoctoral fellowship awardee from 2008-2010.

Gordon Feller, Director, Office of the EVP, Cisco Systems; and Founder, Meeting of the Minds, USA

Gordon Feller is a Director at Cisco Systems headquarters in Silicon Valley, reporting to Wim Elfrink, the company's EVP-Industry Solutions and Chief Globalization Officer. Feller is also Co-founder/Convenor of Meeting of the Minds, an annual leadership summit organized since 2007 by Urban Age Institute (UAI). Prior to joining Cisco, Feller was CEO of UAI, an international non-profit research/training organization which began as a magazine inside the World Bank and was spun off ten years later in 2001. For 30 years, Feller's advised on economic and technology issues with leaders of multinational companies, cities, NGOs / foundations, and national governments. His clients included World Bank, United Nations, German and Canadian national governments, The Rockefeller Foundation, IBM, Reuters, Metropolis, and United Cities & Local Governments. Feller advises leaders on how advanced technologies enable leaders to solve complex problems — with a special focus on developing practical and forward-looking solutions where economics, technology, and sustainability intersect. His work is the basis of documentaries and other multimedia projects. Feller's published hundreds of articles in newspapers, scholarly journals, and magazines, including CFO Magazine, Urban Land Magazine, TIME Magazine, Financial Times. He was formerly executive editor of Urban Age Magazine and Planet Earth Magazine. Feller's a keynote speaker at key leadership events. Columbia University awarded him a Bachelor's in political science, cum laude, and a Master's in International Affairs. At Columbia he served as a Lehman Fellow, a Wallach Fellow and a Deans Fellow. In June 2014, Feller was appointed as a Global Fellow of the Commons Lab, Science and Technology Innovation Program, Woodrow Wilson International Center for Scholars.

Gerhard Fettweis, Vodafone Chair Professor, Technische Universität Dresden, Germany

Gerhard Fettweis earned his Ph.D. under H. Meyr's supervision from RWTH Aachen in 1990. After one year at IBM Research in San Jose, CA, he moved to TCSI Inc., Berkeley, CA. Since 1994 he is Vodafone Chair Professor at TU Dresden, Germany, with 20 companies from Asia/Europe/US sponsoring his research on wireless transmission and chip design. He coordinates 2 DFG centers at TU Dresden, namely cfaed and HAEC. Gerhard is IEEE Fellow, member of the German academy acatech, and his most recent award is the Stuart Meyer Memorial Award from IEEE VTS. In Dresden he has spun-out eleven start-ups, and setup funded projects in volume of close to EUR 1/2 billion. He has helped organizing IEEE conferences, most notably as TPC Chair of ICC 2009 and of TTM 2012, and as General Chair of VTC Spring 2013 and DATE 2014.

Paul Fortier, Professor, Université Laval, Canada

Paul Fortier received his B.Sc. degree and his M.Sc. degree in Electrical Engineering from Laval University in 1982 and 1984, respectively and his M.S. degree in Statistics and his Ph.D. degree in Electrical Engineering from Stanford University in 1987 and 1989, respectively. Since 1989, he has been with the Department of Electrical and Computer Engineering at Université Laval where he is currently a full professor. From 1991 to 1996, he was program director for the B.Sc. degree in Computer Engineering and from 1997 to 2003 he was Chairman of the Department of Electrical and Computer Engineering. From 2003 to 2007, he was Associate Dean for Development and Research at the Faculty of Science and Engineering. From 2007 to 2009, he was Vice-president Scientific Affairs and Partnerships at FQRNT (Quebec's granting agency). From 2010 to 2012, he was Vice-President for Research and Innovation at Laval University. He is currently Director of the Institute for Information Technologies and Societies at Laval University. His research interests include digital signal processing for communications and the study of complexity and performance tradeoffs in hardware implementations, with applications in wireless. He has been involved in the organization of national and international conferences and workshops in these fields. He has done consulting work for several companies

and government agencies in Canada. Dr. Fortier is a Fellow of the Engineering Institute of Canada, a Fellow of the Canadian Academy of Engineering and a Senior Member of the Institute of Electrical and Electronics Engineers (IEEE).

Pierre-Alexandre Fournier, Co-Founder and CEO, Hexoskin, Canada

Pierre-Alexandre Fournier is co-founder and CEO of Hexoskin, a wearable health technology company based in Montreal that focuses on smart clothing design and intelligent software for health and performance. Hexoskin was founded in 2006, and launched in 2013 the first iPhone compatible smart clothing for health monitoring. His work at Hexoskin involves the development of new wearable sensors for remote health monitoring during space missions, physiological algorithms for health analysis, and smart clothing design. Pierre-Alexandre is also the co-founder of Quantified Self Montreal, a group that promotes self-knowledge through numbers.

Dominique Gauthier, CTO, iBwave, Canada

Dominique Gauthier dedicated the majority of his career to ensuring flawless in-building wireless network coverage to provide anytime anywhere connectivity. He co-founded iBwave, a company serving over 700 leading telecommunication firms with innovative in-building solutions in over 80 countries worldwide. Dominique took his 10 years of experience working for Bell Canada, a leading Canadian wireless operator, to create a unique product suite that would address the needs of the in-building wireless market, soon becoming the standard for the entire in-building ecosystem.

Monisha Ghosh, Principal Engineer, Wireless Systems Incubation, InterDigital, USA

Monisha Ghosh is currently a Principal Engineer at Interdigital, researching wireless technologies for 5G cellular and next generation Wi-Fi systems, with a particular emphasis on mmWave usage in both systems. Prior to this, she worked at Philips Research, Briarcliff Manor, and Bell Laboratories, Murray Hill, on various communication systems such as the HDTV broadcast standard, cable standardization and on cognitive radio for the TV White Spaces, and briefly in clinical informatics. She has been an active contributor to many industry standards and was recognized with a Certificate of Appreciation for her outstanding contributions to IEEE 802.22. Her research interests are broadly in the area of signal processing and communications. She received her Ph.D. in Electrical Engineering from the University of Southern California in 1991, and her B. Tech from the Indian Institute of Technology, Kharagpur in 1986. She is a Fellow of the IEEE.

Bruce Gustafson, Vice President, Government and Industry Affairs, Ericsson North America, USA

Bruce Gustafson, Head of Government and Industry Affairs for Ericsson in North America, is responsible for Ericsson's relationship with regulators, government officials, and industry associations in the United States and Canada. He is based in Washington, DC. With 25 years in the industry, Gustafson was most recently Head of Brand & Internal Communications for Ericsson in North America, and Head of Marketing for Ericsson's CDMA business unit. The CDMA business was acquired from Nortel Networks in 2009. Gustafson was part of the team that led the integration of the global unit into Ericsson. Prior to this, Gustafson held various leadership roles in Marketing, Operations, Strategy, and Communications during his 20 years at Nortel Networks. Gustafson holds a Bachelor of Science degree in Industrial Engineering from the University of Manitoba, and a Masters of Business Administration from the University of Calgary, both in Canada. He also holds a Juris Doctor degree from Southern Methodist University, and is a member of the State Bar of Texas. He serves on the board for several industry organizations in the D.C. area.

Robert W. Heath, Professor, University of Texas at Austin, USA

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. 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 co-author of the book "Millimeter Wave Wireless Communications" published by Prentice Hall in 2014. He is a licensed Amateur Radio Operator, a registered Professional Engineer in Texas, and is a Fellow of the IEEE.

Kaibin Huang, Professor, The University of Hong Kong, China

Kaibin Huang received the B.Eng. (first-class hons.) and the M.Eng. from the National University of Singapore and the Ph.D. degree from The University of Texas at Austin (UT Austin) all in electrical engineering. Since Jan. 2014, he has been an assistant professor in the Dept. of Electrical and Electronic Engineering (EEE) at the University of Hong Kong. He is an adjunct professor in the School of EEE at Yonsei University in S. Korea. He used to be a faculty member in the Dept. of Applied Mathematics (AMA) at the Hong Kong Polytechnic University (PolyU) and the Dept. of EEE at Yonsei University. He had been a Postdoctoral Research Fellow in the Department of Electrical and Computer Engineering at the Hong Kong University of Science and Technology from Jun. 2008 to Feb. 2009 and an Associate Scientist at the Institute for Infocomm Research in Singapore from Nov. 1999 to Jul. 2004. His research interests focus on the analysis and design of wireless networks using stochastic geometry and multi-antenna techniques. Dr. Huang frequently serves on the technical program committees of major IEEE conferences in wireless communications. He chaired the Comm. Theory Symp. of IEEE GLOBECOM 2014 and the Adv. Topics in Wireless Comm. Symp. of IEEE/CIC ICCC 2014 and has been the technical co-chair for IEEE CTW 2013, the track chair for IEEE Asilomar 2011, and the track co-chair for IEE VTC Spring 2013 and IEEE WCNC 2011. He is a guest editor for the IEEE Journal on Selected Areas in Communications, an editor for the IEEE Transactions on Wireless Communications, IEEE Wireless Communications Letters and also IEEE/KICS Journal of Communication and Networks. He is an elected member of the SPCOM Technical Committee of the IEEE Signal Processing Society. Dr. Huang received the Outstanding Teaching Award from Yonsei, Motorola Partnerships in Research Grant, the University Continuing Fellowship from UT Austin, and Best Paper Awards from IEEE GLOBECOM 2006 and PolyU AMA in 2013.

Eduard Jorswieck, Professor, Technische Universität Dresden, Germany

Eduard A. Jorswieck is head of the Chair of Communications Theory and Full Professor at Technische Universität Dresden (TUD), Germany. Eduard's main research interests are in the area of signal processing for communications and networks, applied information theory, and communications theory. He has published more than 75 journal papers and some 200 conference papers on these topics. Dr. Jorswieck is senior member of the IEEE. He was member of the IEEE SPCOM Technical Committee (2008-2013), and since 2015 he is member of the IEEE SAM Technical Committee. Since 2011, he acts as Associate Editor for IEEE Transactions on Signal Processing. Since 2008, continuing until 2011, he has served as an Associate Editor for IEEE Signal Processing Letters, and until 2013, as Senior Associate Editor. Since 2013, he serves as Editor for IEEE Transactions on Wireless Communications. In 2006, he received the IEEE Signal Processing Society Best Paper Award.

David Keegstra, Chief Technology Officer, Ericsson Canada Inc., Canada

David Keegstra is a 25-year veteran of the telecom industry in Canada, joining Ericsson in 2010 as Chief Technology Officer for a customer unit focused on Bell, TELUS, SaskTel, and new entrants. Keegstra has helped grow Ericsson Canada's business in areas of IMS, IPTV, OSS, Machine to Machine, Microwave and Radio Access Networks. Prior to joining Ericsson, Keegstra worked as VP Technology for Huawei in the United States, focusing on LTE deployment for AT&T. From 2005 to 2009 Keegstra led Wireless Access Technology development at Telus Mobility, overseeing the introduction of HSPA+ and EVDO in a nationwide network expansion and driving the convergence of wireless and wireline transport on an ethernet/MPLS platform. Keegstra has also worked for Nortel Networks, leading the Canadian region RF design, deployment and optimization services, as well as Senior Manager of Engineering through to 2001. Keegstra graduated from McMaster University in Hamilton with a Bachelor of Engineering – Engineering Physics.

John B. Kenney, Director and Principal Researcher, Toyota InfoTechnology Center, USA

John B. Kenney holds electrical engineering degrees from Stanford and Notre Dame, where he also served as Adjunct Professor. Currently he is Director and Principal Researcher at the Network Division of Toyota InfoTechnology Center in Mountain View, CA. John represents Toyota in the automakers' Vehicle Safety Communication consortium, including as past lead of the VSC-A Communications Task. He and Dr. Bansal actively contribute to VSC research in congestion control and security. He also represents the industry in the investigation of potential sharing of spectrum between DSRC and unlicensed devices, including recent testimony before a US Congressional committee. He is active in IEEE and European standards, and serves as an elected officer of the SAE DSRC Technical Committee. He co-chaired the 2011 and 2012 ACM VANET Workshops, and the IEEE SmartVehicles 2014 Workshop. He also authored an invited Proceedings of the IEEE paper on DSRC Standards in the US (2011).

Avinash Karanth Kodi, Professor, Ohio University, USA

Avinash Karanth Kodi received his PhD and MS from Electrical and Computer Engineering from the University of Arizona in August 2006 and May 2003, respectively. He completed his BE in Electronics and Communications in February 2000 from Manipal Institute of Technology, Mangalore University. Presently, he is an Associate Professor at the School of Electrical Engineering and Computer Science at Ohio University. Dr. Kodi leads the Technologies for Emerging Computer Architecture Laboratory (TEAL) at Ohio University. He has published more than 60 publications in IEEE and OSA peer-reviewed conferences and journals in the field of computer architecture and optical interconnection networks. His research interests include computer architecture, optical interconnects, Network-on-Chips (NoCs) and emerging technologies such as nanophotonics, 3D and wireless interconnects. He is the recipient of the NSF Career Award in 2011, Best Paper Award at the ICCD 2013 conference and his papers have been nominated for Best Paper at IEEE Symposium on Network-on-Chips (NoCs) in May 2010 and IEEE Asia & South Pacific Design Automation Conference (ASP-DAC) in January 2009. He is member of ACM and a senior member of the IEEE.

Fabrice Labeau, Associate Professor, McGill University, Canada

Fabrice Labeau is an Associate Professor with the Electrical and Computer Engineering Department, McGill University, where he holds the NSERC/Hydro-Québec Industrial Research Chair in Interactive Information Infrastructure for the Power Grid. From 1996 to 2000, he was with the Communications and Remote Sensing Laboratory, Université Catholique de Louvain (UCL), Belgium.. His research interests are in applications of signal processing to healthcare, power grids, communications, and signal compression. He has authored more than 150 refereed papers in refereed journals and conference proceedings in these areas. He is the Associate Director for Operations of SYTACom, an interuniversity research center grouping 50 professors and 500 researchers from 10 universities in the Province of Quebec, Canada. He has held several administrative and management positions at McGill University, including Associate Department Chair, Associate Dean, Interim Department Chair, and Acting Dean. He is the President of the IEEE Vehicular Technology Society (VTS) (2014-2015), a member of the AdCom of the IEEE Sensors Council (2015-2016), the Chair of the IEEE Montreal Section as well as its VTS Chapter. He was the TPC Co-Chair for the Vehicular Technology Conference in 2006 and 2012, and is the TPC Co-Chair of IEEE ICIP 2015 and IEEE ICUWB 2015. He is a member of the IEEE TAB Periodicals Committee, the IEEE Transactions on Big Data Steering Committee, and the IEEE Transactions on Intelligent Vehicles Steering Committee. He is a member of the IEEE Signal Processing Society (SPS) Technical Activities Board, and an Associate Member of the SPS Image, Video, and Multidimensional Signal Processing Technical Committee.

Bernard Lord, President & CEO, Canadian Wireless Telecommunications Association (CWTA), Canada

Bernard Lord is President & CEO of the Canadian Wireless Telecommunications Association (CWTA). He is also the Chair of the Mobile Giving Foundation Canada. Mr. Lord currently serves as a corporate director and advisor for several organizations, including as Board Chair for Ontario Power Generation. As President & CEO of CWTA, Bernard Lord is a champion for wireless telecommunications development in Canada. He firmly believes that wireless telecommunications generate economic growth and prosperity while improving our personal lives and enhancing our communities. Mr. Lord has often been recognized as a national leader and consensus builder. He served two terms as Premier of New Brunswick from 1999 until 2006, and was elected four times as a Member of the New Brunswick Legislative Assembly.

Jim MacFie, National Standards Officer, Microsoft Canada, Canada

Jim MacFie, as a National Standards Officer for Microsoft Canada, represents the company's standards interests and embodies Microsoft's commitment to the Canadian National Standards System. To that purpose, Jim participates directly in a mix of standards development and standards governance activities, and coordinates Microsoft Canada's other participation in domestic and international standards organizations, especially JTC 1 and ITU. In particular, Jim is active in JTC 1 Standardization and the Standards Council of Canada's system of Advisory Committees, including Chair of the Advisory Committee for JTC 1, and member of several other JTC 1 Advisory Committees. He is also Member of the Steering Committee of the Canadian National Organization for the International Telecommunication Union, a Liaison officer from JTC 1 to ITU-T, and Vice-chair of the ITU-T Strategic Review committee, representing the Americas region. Prior to joining Microsoft, Jim was with Nortel, responsible for the company's Canadian standards strategy, which included a similar level of participation in the Canadian standards community as described above (except more ITU-T and not as much JTC 1). Prior to Nortel, Jim was employed by the telephone operating companies that eventually became TELUS, engaged in telecom network planning. Jim holds an M.Sc. in E.E. from Oxford University in 1973, and a B.Sc. in E.E from the University of Alberta in 1972.

Martin Maier, Professor, INRS-EMT, Canada

Martin Maier is a full professor with the Institut National de la Recherche Scientifique (INRS), Montreal, Canada. He was educated at the Technical University of Berlin, Germany, and received MSc and PhD degrees both with distinctions (summa cum laude) in 1998 and 2003, respectively. In summer 2003, he was a postdoc fellow at the Massachusetts Institute of Technology (MIT), Cambridge. He was a visiting professor at Stanford University, Stanford, October 2006 through March 2007. Dr. Maier was a recipient of the two-year Deutsche Telekom doctoral scholarship from June 1999 through May 2001. He is a co-recipient of the 2009 IEEE Communications Society Best Tutorial Paper Award and Best Paper Award presented at The International Society of Optical Engineers (SPIE) Photonics East 2000-Terabit Optical Networking Conference. He is the founder and creative director of the Optical Zeitgeist Laboratory (www.zeitgeistlab.ca). Dr. Maier is the author of the book "Optical Switching Networks"(Cambridge University Press, 2008), which was translated into Japanese in 2009, and the lead author of the book "FiWi Access Networks" (Cambridge University Press, 2012). His work aims at rethinking the role of optical networks with a focus on communications, energy, and transport for smart grid and e-mobility applications as well as bimodal FiWi networks for unified broadband access solutions.

Hugh Mansfield, Senior Partner, Goudreau Gage Dubuc, Canada

Hugh Mansfield is a Senior Partner at Goudreau Gage Dubuc in Montreal and has been practicing the law of patents since 2001. Prior to practicing law, Mr. Mansfield attended McGill Faculty of Engineering where he earned a BEng (Electrical) and McGill Faculty of Law where he earned both BCL and LLB degrees. He is a member of the Quebec Bar, the Quebec Order of Engineers and the IEEE, and is also registered patent agent with both the Canadian Intellectual Property Office and the United States Patent and Trademark Office. In between his studies in engineering and law Mr. Mansfield developed systems and software at Elektronik System and Logistik GmbH (ESG) in Munich, Germany, primarily in support of air traffic control, and where he also acted as a representative of the German civil aviation authority on international standardization panels. Mr. Mansfield's practice currently focusses on the preparation and prosecution of patent applications, primarily in the fields of software, electronics and telecommunications.

Anna Mazhorova, Research Fellow, INRS-EMT, Canada

Anna Mazhorova is currently a Mitacs Elevate Postdoctoral Research Fellow at INRS-EMT, Canada. Her research activities focus on the investigation of optical nonlinear wave propagation in soft matter nonlinear media. These topics include studies of the autoresonance effects in non-uniform second order nonlinear materials, as well as development of devices for the enhancement and manipulation of THz waves, including sub-wavelength micro and nano-imaging systems at THz wavelengths, magnetic non-reciprocal isolators, photonic crystal beamsplitters, low loss waveguides, properties of graphene monolayers and E.coli bacteria biosensing. She is author/coauthor of more than 15 papers in international peer-reviewed journals, and has more than 30 contributions at international conferences.

Urbashi Mitra, Professor, University of Southern California, USA

Urbashi Mitra received the B.S. and the M.S. degrees from the University of California at Berkeley and her Ph.D. from Princeton University. Prior to her PhD studies, she was a Member of Technical Staff at Bellcore. After a six-year stint at the Ohio State University, she joined the Department of Electrical Engineering at the University of Southern California, Los Angeles, where she is currently a Professor. She is the inaugural Editor-in-Chief for the IEEE Transactions on Molecular, Biological and Multi-scale Communications. Dr. Mitra is a Distinguished Lecturere for the IEEE Communications Society for 2015-2016. She is a member of the IEEE Information Theory Society's Board of Governors (2002-2007, 2012-2014) and the IEEE Signal Processing Society's Technical Committee on Signal Processing for Communications and Networks (2012-2014). Dr. Mitra is a Fellow of the IEEE. She is the recipient of: a 2015 Insight Magazine STEM Diversity Award, 2012 Globecom Signal Processing for Communications Symposium Best Paper Award, 2012 NAE Lillian Gilbreth Lectureship, USC Center for Excellence in Research Fellowship (2010-2013), the 2009 DCOSS Applications & Systems Best Paper Award, Texas Instruments Visiting Professor (Fall 2002, Rice University), 2001 Okawa Foundation Award, 2000 OSU College of Engineering Lumley Award for Research, 1997 OSU College of Engineering MacQuigg Award for Teaching, and a 1996 National Science Foundation (NSF) CAREER Award. Dr. Mitra currently serves on the following IEEE award committees: Fourier Award for Signal Processing, James H. Mulligan, Jr. Education Medal, and the Paper Prize Award. She has been/is an Associate Editor for the following IEEE publications: Transactions on Signal Processing (2012--), Transactions on Information Theory (2007-2011), Journal of Oceanic Engineering (2006-2011), and Transactions on Communications (1996-2001). She has co-chaired: (technical program) 2014 IEEE International Symposium on Information Theory in Honolulu, HI, 2014 IEEE Information Theory Workshop in Hobart, Tasmania, IEEE 2012 International Conference on Signal Processing and Communications, Bangalore India, and the IEEE Communication Theory Symposium at ICC 2003 in Anchorage, AK; and general co-chair for the first ACM Workshop on Underwater Networks at Mobicom 2006, Los Angeles, CA Dr. Mitra was the Tutorials Chair for IEEE ISIT 2007 in Nice, France and the Finance Chair for IEEE ICASSP 2008 in Las Vegas, NV. Dr. Mitra has held visiting appointments at: the Delft University of Technology, Stanford University, Rice University, and the Eurecom Institute. She served as co-Director of the Communication Sciences Institute at the University of Southern California from 2004-2007. Her research interests are in: wireless communications, communication and sensor networks, detection and estimation and the interface of communication, sensing and control.

Roberto Morandotti, Professor, INRS-EMT, Canada

Roberto Morandotti is a full professor at INRS–EMT, Canada. He has a broad experience in nonlinear optics and THz photonics. In particular, his expertise ranges from the fabrication of micro and nano- photonic structures to the use of various characterization techniques in optics. His recent interests include the study of optical discrete solitons, magneto-optic waveguides, novel materials for optoelectronics, all optical switching at ultra low powers and in the THz regime, nonlinear and quantum optical devices on an integrated CMOS compatible platform, etc. He is author/coauthor of around 500 journal and conference papers, including some 30 articles in Physical Review Letters (PRL), more than 10 contributions (to date) in Nature, Nature Physics, Nature Photonics and Nature Communications, as well as over 100 invited papers and seminars. He is committee member for several OSA, SPIE, and IEEE conferences, and Fellow of the Royal Society of Canada, a Fellow of the APS, a Fellow of the OSA, a Fellow of the SPIE, an E.W.R. Steacie Memorial Fellow, a Fellow of the Institute of Nanotechnology and an Elected Member of Sigma Xi.

Hussein Mouftah, Professor, University of Ottawa, Canada

Hussein T. Mouftah is a Distinguished University Professor and Senior Canada Research Chair in Wireless Sensor Networks at the School of Electrical Engineering and Computer Science of the University of Ottawa, Canada. He has been with the ECE Dept. at Queen's University (1979-2002), where he was prior to his departure a Full Professor and the Department Associate Head. He has six years of industrial experience mainly at Bell Northern Research of Ottawa (then known as Nortel Networks). He served as Editor-in-Chief of the IEEE Communications Magazine (1995-97) and IEEE ComSoc Director of Magazines (1998-99), Chair of the Awards Committee (2002-03), Director of Education (2006-07), and Member of the Board of Governors (1997-99 and 2006-07). He has been a Distinguished Speaker of the IEEE Communications Society (2000-2008). He is the author or coauthor of 9 books, 60 book chapters and more than 1300 technical papers, 12 patents and 140 industrial reports. He is the joint holder of 19 Best Paper and/or Outstanding Paper Awards. He has received numerous prestigious awards, such as the 2007 Royal

Society of Canada Thomas W. Eadie Medal, the 2007-2008 University of Ottawa Award for Excellence in Research, the 2008 ORION Leadership Award of Merit, the 2006 IEEE Canada McNaughton Gold Medal, the 2006 EIC Julian Smith Medal, the 2004 IEEE ComSoc Edwin Howard Armstrong Achievement Award, the 2004 George S. Glinski Award for Excellence in Research of the U of O Faculty of Engineering, the 1989 Engineering Medal for Research and Development of the Association of Professional Engineers of Ontario (PEO), and the Ontario Distinguished Researcher Award of the Ontario Innovation Trust. Dr. Mouftah is a Fellow of the IEEE (1990), the Canadian Academy of Engineering (2003), the Engineering Institute of Canada (2005) and the Royal Society of Canada RSC Academy of Science (2008).

Magnus Olsson, Senior Researcher, Energy Performance, Ericsson Research, Sweden

Magnus Olsson has been with Ericsson AB, Stockholm, Sweden, since 2000, where he currently is a Senior Researcher specialized in Energy Performance. Over the years he has worked on several radio technologies and areas such as advanced antenna systems, interference rejection techniques, and energy efficiency of radio access networks (RAN). He has authored and co-authored over 30 international journal and conference papers, and is a recipient of the IEEE Communications Society Fred W. Ellersick Prize (2014). He has held leading positions in both internal as well as various European research projects. For example, 2008-2009 he was managing Ericsson's research activities on multi-antenna technologies targeting LTE-Advanced, and 2011-2012 he was the Technical Manager of the EU FP7 EARTH project on RAN energy efficiency which received the ceFIMS Future Internet Award (2012). Currently he is coordinating Ericsson's research on e2e energy performance, with a special focus on 5G and cloud technologies.

Ravi Pragada, Principal Engineer, Wireless Systems Incubation, InterDigital, USA

Ravi Pragada is a Principal Engineer at InterDigital Labs where he is currently leading millimeter wave air-interface related technologies for next generation cellular systems. He has actively contributed to and held leadership positions in various projects related to 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 at InterDigital. Prior to InterDigital he was 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.

Célestin Ratsimbazafy, Senior Engineer, Orientations and Integration – Energy Efficiency, Hydro Québec, Canada

Célestin Ratsimbazafy' career has spanned over 36 years in the aeronautical engineering industry and renewable energies segments of the information technology and communications sector. In addition to having been a faculty member of the Département de Mathématiques et Informatique de l' Université du Québec à Montréal, he later held various positions in the private sector including Technical Director at Réseau National des Chemins de Fer Malagasy (RNCFM), Attaché de Direction at Air Madagascar, and Senior Engineer at Hydro-Québec. Celestin Ratsimbazafy holds a bachelor's degree in electrical engineering as well as an M.Sc.A. degree from École Polytechnique de l'Université de Montréal. He has a unique blend of experience gained from working in both academia, and power system industry; he has been working in the electric power systems innovations area since 1992 focusing on smart grids, energy efficiency, electrical power systems planning, network studies, energy markets and utility regulations. His experience in the electricity energy markets includes energy, ancillary service and capacity markets design, analysis and regulations. His passion is to educate, inspire and motivate others to be successful as a master designer for smart cities sustainable development projects. His innovative approaches combine a perfect balance of Disruptive Technologies and of Disruptive Businesses well suited for making business successes in the ongoing digital era of smart cities. He has provided strategic assessment on sustainable urban development and also Transit Oriented Development (TOD) projects to assist Cities and Municipalities in developing innovative solutions.

Veena Rawat, Communications Technologies Consultant, Canada

Veena Rawat is an internationally acclaimed expert in Radio Frequency Spectrum Planning and Management, currently working as a Communications Technologies Consultant, providing advisory services to a number of organizations and corporations nationally and internationally. In 2014 she became an Officer of the Order of Canada for her "contributions to telecommunications engineering and for leadership in establishing the global regulatory framework for radio spectrum management". Between 2011 and 2014, Dr. Rawat worked as Vice President and Ambassador to ITU for BlackBerry. During 2004-2011, Dr. Rawat was President of Communications Research Centre, the only Canadian federal government research lab conducting R&D in all communications technologies. Before heading CRC, Dr. Rawat spent 28 years within the Canadian Government where she held executive positions managing programs related to radio frequency spectrum engineering for all wireless and space communication services. This included: leading negotiations at the International Telecommunication Union of United Nations (ITU), Organization of American States (OAS) and US Government (FCC, NTIA); chairing major national and international committees. She has been keynote and invited speaker, panelist and moderator for over 100 conferences and events dealing with technology trends, wireless technologies, radio spectrum matters, and Canadian S&T matters. She has served on the Board of numerous national and international professional organizations. Dr. Rawat has had many "firsts" in her career, a trail blazer, starting from first female PhD ever in 1973 in Electrical Engineering from Queens University, Kingston, Ontario, to being the first female (and first Canadian as well) ever to chair ITU's highest level meeting WRC (World Radio Conference) in 2003 held in Geneva for which she was awarded ITU's gold medal by the Secretary General. Other key awards are: IEEE for Public Service in Communications – 2012; from the Government of Canada the highest Public Service Award of Excellence – 2011; From Canadian Women in Communications' Canadian Woman of the Year – 2004; Canadian Women's Executive Network's Canada's Most Powerful Women, Top 100 (2005); and by ICOBC (Indo Canada Ottawa Business Chamber) Award of Excellence in 2014 and Professional Woman of the year in 2005.

Philippe Rincon, Senior Director, Digital Strategy and Development, Quebecor Digital, Canada

Philippe Rincon is Senior Director at Québecor Digital. He is leading the digital strategy of this subsidiary whose mission is to become the growth engine of Quebecor group. Philippe and his team support the group's divisions to help them integrate Digital at the heart of their business strategies. Mobility is the main pillar of its team's concerns. Before joining Quebecor Digital, Philippe was the head of Digital Strategy at TVA (TVA interactive). Within TVA, Philippe and his team have delivered more than fifteen mobile applications (The Voice, Signé M, On connaît la chanson, Al Dante, Le tricheur, etc.). Philippe graduated from Diderot University in Paris where he became Professor. For almost 10 years, his courses dealt with Open-source technologies, Web development, interactive marketing, and what we then called the "new economy". Meanwhile, Philippe became, in 2006, a partner in the Consultancy PK12-8 in Paris where he led the digital strategy department. During these years, he helped numerous clients develop their interactive marketing and deepen their expertise in digital business transformation.

Malcolm Robertson, 5G Planning Manager, CTO Office, Keysight Technologies, USA

Malcolm Robertson joined Keysight Technologies (then Agilent Technologies) in 2000, working in the development of wireless test solutions for cellular and non-cellular applications. He has held positions in manufacturing engineering, R&D management, and strategic planning. Malcolm holds a Bachelor of Science (Honours) degree in Physics and Electronics and a PhD from the University of St. Andrews in Scotland. His PhD and subsequent postgraduate work was undertaken as part of the millimeter-wave and terahertz research group, focusing on novel millimeter-wave sources.

John Robinson, Professor, University of British Columbia, Canada

John Robinson is Associate Provost, Sustainability, responsible for leading the integration of academic and operational sustainability on the University of British Columbia's Vancouver campus. Dr. Robinson's own research focuses on the intersection of climate change mitigation, adaptation and sustainability; the use of visualization, modeling, and citizen engagement to explore sustainable futures; sustainable buildings and urban design; creating partnerships for sustainability with none-academic partners; and, generally, the intersection of sustainability, social and technological change, behaviour change, and community

engagement processes. He is also a professor with UBC's Institute for Resources, Environment & Sustainability, and the Department of Geography. The Centre for Interactive Research on Sustainability (CIRS), opened in 2011 on the UBC campus, is a major focus of his work. As Associate Provost, he leads a team dedicated to infusing sustainability throughout UBC's operations and academic activities, and to building partnerships with private, public and NGO sector partners, in the context of treating the university campus as a living laboratory of sustainable practice, research and teaching. In 2012 Dr. Robinson received the Metro Vancouver Architecture Canada Architecture Advocacy Award and was named Environmental Scientist of the Year by Canadian Geographic magazine. In 2011, he received the Canada Green Building Council Education Leadership Award, and in 2010 he was given BC Hydro's Larry Bell Award for advancing energy conservation in British Columbia. He was a Fellow of the Pierre Elliot Trudeau Foundation from 2008-11, and, as a Lead Author, he contributed to the 1995, 2001 and 2007 reports of the Intergovernmental Panel on Climate Change, which won the Nobel Peace Prize in 2007 with Al Gore.

Bruce Rodin, Vice President Wireless Technology, Bell Canada, Canada

Bruce Rodin is Vice President Wireless Technology at Bell Mobility, the wholly owned wireless division of Bell Canada. In this role, he is responsible for the development of all new wireless technologies at Bell including the establishment of strategic direction relating to spectrum acquisition, network planning and development, services planning and development and product planning and development. The Bell wireless laboratories are managed by Mr. Rodin's teams. Mr. Rodin is on the Board of Directors of the Next Generation Mobile Network (NGMN). Prior to taking on his current role in 2008, Mr. Rodin was the Director, Wireless Technology Strategy. In that position, he actively supported his teams involvement in a broad range of research, industry, and standards forums including WWRF, 3GPP2/TIA, 3GPP/ETSI, WiMax Forum, OMA, CDG, GSMA, and NGMN.nMr. Rodin joined Bell Mobility in 1988 and has held numerous positions within the development and engineering teams. Mr Rodin received a Bachelors of Science degree in Electrical Engineering from Queen's University at Kingston in 1980 and is a member of the Professional Engineers of Ontario and the IEEE.

Vincent Roy, Director, Wireless Systems Incubation, InterDigital, Canada

At InterDigital, Vincent has lead research projects focused on the air interface design and standardization design of HSPA, LTE and LTE-A. He is currently responsible for the strategy and execution on multiple technology areas centered on 5G. He holds 63 issued patents centered on 3G, 4G, 802.11 and other advanced wireless systems. Prior to joining InterDigital, Vincent did research on 3G systems research engineer at Ericsson and for a cellular operator on behalf of the North American GSM Alliance. Vincent received his B. Eng. from École Polytechnique de Montréal in 1996 and his M.Sc. in wireless communications from INRS-Télécommunications in 1998. He later obtained a MBA from McGill.

Abdelaziz Samet, Research Associate, INRS-EMT, and Co-Director, Wireless Lab, Canada

Abdelaziz Samet was born in Tunisia on September 18, 1959. He received the B.Sc. degree in electrical engineering from the Ecole Nationale Supérieure de l'Electronique et de ses Applications (ENSEA), Cergy, France, in 1984, and the M.Sc. and Ph.D. degrees in electrical engineering from the Ecole Nationale d'Ingénieurs de Tunis (ENIT), Tunis, Tunisia, in 1988 and 1993, respectively. He was Professor at the Institut National des Sciences Appliquées et de Technologie (INSAT) and the Head of the SERCOM-Lab (formerly known as Research Unit - Electronic Systems and Components) at the Ecole Polytechnique de Tunisie (EPT), Carthage University, Tunisia. Since September 2012, he joined INRS-EMT, Canada, as a Research Associate and Co-Director of the Wireless Lab. His current research interests include wireless communications and signal processing.

Venkatesh Sampath, Director, Regulatory Affairs and Standards Policy, Ericsson Canada Inc., Canada

Venkatesh Sampath joined Ericsson Canada in January 2008, and is currently working as the Director of Regulatory Affairs and Standards Policy. In this role, Mr. Sampath has the dual responsibility of coordinating Government and Industry Relations (GIR) and carrying out technology and standardization activities related to present and future mobile wireless networks. Mr. Sampath works closely with Industry Canada and the International Telecommunications Union (ITU) on spectrum and technology matters. He is the Chair of the Canadian Evaluation Group and is a Canadian delegate to the ITU. Prior to Ericsson, Mr. Sampath worked as a private

consultant from 2003-2007 for various companies both in the United States (Nexius, Nextel, Flarion Technologies) and Canada (Oz Communications, Trio Capital) in a mainly technology capacity such as the testing of base-station and user equipment to get the CE mark, laboratory and field testing of Flash-OFDM networks. Between 1996 and 2002, Mr. Sampath was with Microcell Telecommunications, where he was Director of the R&D/Standardization group. Mr. Sampath holds an M.Sc. and a Ph.D. in Electrical Engineering – both from Université Laval (Québec city). He i s a Senior Member of the IEEE.

Mohamad Sawan, Professor, Polytechnique Montréal, and Director, ReSMiQ Research Centre, Canada

Mohamad Sawan has made outstanding contributions in bridging microelectronics into biomedical engineering to build smart medical devices dedicated to improve the quality of human life. For more than a decade his research has been directed towards designing and building wireless implantable microsystems to restore lost sensory ability or functions of body organs through monitoring and low-current stimulation. The medical applications of these microsystems have won Dr. Sawan worldwide visibility and recognition and multiple honors and awards. In particular, he was recently elected a Fellow of the Canadian Academy of Engineering, the most prestigious honor aspired to by Canadian engineering researchers, and a Fellow of the IEEE, the most prestigious honor aspired to by worldwide electrical engineers. Dr. Sawan was awarded the Medal of Honor from the President of Lebanon for his outstanding achievements, and the J. A. Bombardier Award for research innovation and technology transfer. Dr. Sawan is the holder of a Tier 1 Canada Research Chair in Smart Medical Devices. He leads the Microsystems Strategic Alliance of Quebec (Regroupement stratégique en microsystèmes du Québec – ReSMiQ). He is the founder of many international scientific committees and meetings such as the Eastern Canadian IEEE-Solid State Circuits Society Chapter and the IEEE-Northeastern workshop on Circuits and Systems (NewCAS). He is the cofounder of the International Functional Electrical Stimulation Society and of the IEEE conference on Biomedical Circuits and Systems (BioCAS). He also is the founder of the Polystim neurotechnologies laboratory at Ecole Polytechnique de Montréal. Dr. Sawan has published over 500 papers in peer reviewed journals and conference proceedings and has been awarded 6 patents. He has received over 40 million dollars in grants and contracts from different Canadian agencies and companies. Dr. Sawan has supervised the research work of 30 Ph.D. students (17 completed), over 100 Master's students (85 completed), and 27 postdoctoral fellows and research assistants (20 completed).

Abdel Sebak, Professor, Concordia University, Canada

Abdel Sebak is a Professor with Concordia University. Before joining Concordia University, he was a professor at the University of Manitoba and Cairo University. He was also with the Canadian Marconi Company, working on the design of microstrip phased array antennas. Dr Sebak's recent research activities cover two streams: Antenna Engineering, and Analytical and Computational Electromagnetics. Applied and sponsored projects include advanced composite materials for aerospace shielding and antenna applications, microwave sensing, and imaging, ultra wideband antennas, microwave beamforming, and high gain mm-wave antennas. Dr. Sebak's original research contributions and technical leadership have been extensive and resulted in over 450 publications in prestigious refereed journals and international conference proceedings. Dr Sebak was inducted as a Fellow of the IEEE in 2009. He is also a Fellow of the Engineering Institute of Canada. Dr. Sebak is a member of Concordia University Provost's Circle of Distinction for his career achievements. For his joint efforts in establishing one of the most advanced electromagnetic computational and antennas labs at the University of Manitoba, Dr. Sebak received the Rh Award for Outstanding Contributions to Scholarship and Research. Dr. Sebak received the 1992 and 2000 University of Manitoba Merit Award for Outstanding Teaching and Research. In 1996 Dr. Sebak received the Faculty of Engineering Superior Academic Performance. Dr Sebak has also received the IEEE Antennas and Propagation Society Best Chapter Award. Dr. Sebak has served as Chair for the IEEE Canada Awards and Recognition Committee (2002-2004), IEEE Canada Conference Committee (2000-2002), and as the Technical Program Chair for the 2002 IEEE CCECE Conference and the 2006 URSI-ANTEM Symposium. He has also served as a member (2002-2004) of the IEEE RAB Awards and Recognition Committee. Dr. Sebak has served as Associate Editor for the Journal of Applied Computational Electromagnetic Society, the International Journal of Antennas and Propagation, and the J. Engineering Research. He is a member of the Canadian National Committee of URSI Commission B, and Co-Chair of IEEE ICUWB 2015.

Zack Settel, Media Artist, Composer, and Associate Researcher, SAT, Canada

Zack Settel started playing and writing music early on, studying classical piano and electronic music, and playing in rock jazz groups. He received a BFA in Music Composition from the California Institute of the Arts (CalArts), where he studied composition with Mortons, Subotnick, and Feldman. In 1986, Settel came to work at the Institute for Research and the Coordination of Acoustics and Music (IRCAM), headed by Pierre Boulez, where he remained until 1995, composing and working full-time in music production and research. From 1997 to 1999, Settel chaired the Music Technology area at McGill University. From 2004 to 2009, he collaborated with the Center for Intelligent Machines at McGill, co-directing immersive audio/music projects. Since 2010, Settel has been teaching courses in immersive sonic arts at the University of Montreal. From 2003 to 2008, he directed the Immersive Audio Research Group he founded at the Societé des Arts Technologiques (SAT), where he is currently a resident artist and researcher. A full-time independent artist, coming from a music composition background, Settel has been able to bring his music to the audiovisual immersive arts, and most recently to "Full Dome" venues in North America.

Muhammad Zeeshan Shakir, Assistant Research Scientist, Texas A&M University at Qatar, Qatar

Muhammad Zeeshan Shakir (M'04) is an Assistant Research Scientist with the Wireless Research Lab, Texas A&M University at Qatar (TAMUQ), Doha, Qatar, since July 2012. Previously, from November 2009 to June 2012, he was a Research Fellow with the Communication Theory Lab, King Abdullah University of Science and Technology (KAUST), Thuwal, Saudi Arabia. He received PhD degree in Electronic and Electrical Engineering from University of Strathclyde, Glasgow, UK in 2010. His research interests include design and deployment of diverse wireless communication systems including hyper-dense heterogeneous small-cell networks with particular focus on traffic offloading/backhauling techniques and Green communications. He is a co-author of two research monographs. He has published more than 75 technical journal and conference papers and has contributed to 6 books, all in well reputed venues. His most of the research has been sponsored by Qatar National Research Fund (QNRF) and national industrial partners. Dr. Shakir has been/is giving tutorials on emerging wireless systems at IEEE flagship conferences including IEEE ICC 2014, Sydney and IEEE Globecom 2014, Austin. He has been a member of TPC of several IEEE flagship conferences. He is the founder of IEEE Workshop BackNets 2015. He is the technical Chair of Crowncom 2015 and several special sessions/workshops. He is serving as a Lead Guest Editor for special issues in IEEE Comm Mag and IEEE Wireless Comm Mag. Currently, he has been serving as Secretary to the IEEE DySPAN 1900.7. He is an active member of IEEE and IEEE Standard Association.

Alex Stéphenne, System Designer, Ericsson Canada, and Adjunct Professor, INRS, Canada

Alex Stéphenne was born in Quebec, Canada, on May 8, 1969. He received the B.Ing. degree in electrical engineering from McGill University, Montreal, Quebec, in 1992, and the M.Sc. degree and Ph.D. degrees in telecommunications from INRS-Télécommunications, Université du Québec, Montreal, in 1994 and 2000, respectively. In 1999 he joined SITA Inc., in Montreal, where he worked on the design of remote management strategies for the computer systems of airline companies. In 2000, he became a DSP Design Specialist for Dataradio Inc. (now part of CalAmp), Montreal, a company specializing in the design and manufacturing of advanced wireless data products and systems for mission critical applications. In January 2001 he joined Ericsson and worked for over two years in Sweden, where he was responsible for the design of baseband algorithms for WCDMA commercial base-station receivers. From 2003 to 2008, he has been still working for Ericsson, but based in Montreal, as a researcher focusing on issues related to the physical layer of wireless communication systems. From 2009 to 2014, he worked as a researcher for Huawei Canada, in Ottawa, on radio resource management for 4G and 5G systems. Since 2014, he has been working with Ericsson Canada, in Ottawa, as a wireless system designer. He is also Adjunct Professor at INRS since 2004 and a Senior member of the IEEE. He was the TPC Co-Chair for the IEEE Vehicular Technology Conference, both in its 2006 and 2012 Fall editions, and is currently the TPC Co-Chair of IEEE ICUWB 2015.

Joachim G. Taiber, Professor, Clemson University, Director, Sustainable Mobility Institute, and CTO, ITIC, USA

Joachim Taiber, after his studies at the Swiss Federal Institute of Technology in Zurich, which resulted in a PhD in Technical Sciences, started his professional career at a Swiss software start-up company in 1995. He joined BMW in 1997 as in-house consultant in the vehicle development division where he worked on different aspects of functional integration and validation of vehicle systems, vehicle electronics platforms as well as vehicle program management. In 2003 Joachim was engaged in the initial planning team to implement the masterplan of a 250-acre automotive research campus in South Carolina closely located to the BMW US manufacturing site as a public private partnership model and to help shape the strategic collaboration with Clemson University. The first facility created on the CU-ICAR (Clemson University International Center for Automotive Research) campus in 2005 was the BMW Information Technology Research Center (ITRC) – a 80,000 sqft building specifically designed to collaborate with BMW IT partners on open innovation and strategic advanced technology projects including the aspects of the "networked vehicle" and the "next generation data center". Joachim was leading the innovation activities at ITRC as Director of the Information Technology Research Office for multiple years and collaborated during this time closely with the BMW Tech Office in Silicon Valley. In 2010 Joachim joined Clemson University as Research Professor and member of the Automotive Engineering faculty and created in 2011 the Sustainable Mobility Institute, which he heads as Director since. In 2013, he founded the non-profit organization called "International Transportation Innovation Center" (ITIC) which addresses multi-stakeholder innovation initiatives that require the involvement of cyber-physical testbeds for technology validation such as for example wireless charging of electrified vehicles. Joachim has a broad expertise in all aspects of automotive engineering as well as automotive related business processes. He has in-depth knowledge in testing vehicles and associated infrastructure such as communication networks and charging systems. He is active in transportation related standardization and policy development in IEEE where he is leading task force activities in cybersecurity for connected vehicles and road electrification. After CU-ICAR grew to the largest automotive research campus in the US Southeast with more than 250 million USD being invested since its creation, Joachim is currently leading the effort to develop and implement in close proximity a 650-acre transportation innovation testbed and automotive technology experience center in a public private partnership model.

Xianbin Wang, Professor, University of Western Ontario, Canada

Xianbin Wang is a Professor and Canada Research Chair in Wireless Communications at University of Western Ontario, Canada. He received his Ph.D. degree in electrical and computer engineering from National University of Singapore in 2001. Prior to joining Western, Dr. Wang was a Senior Research Scientist/Research Scientist at Communications Research Centre Canada between July 2002 and December 2007. His research interests include adaptive wireless systems and mobile applications, communications security, and distributed computing systems. His current research activities on 5G are focused on heterogeneous networking, cooperative/relay communications, and data offloading. He has over 170 peer-reviewed journal and conference papers on various communication system and network design issues, in addition to 23 granted and pending patents and several standard contributions. Dr. Wang has received a number of prestigious domestic and international awards and recognitions, including Canada Research Chair, three IEEE Best Paper Awards, the President's Excellence Award and Technology Transfer Award from Communications Research Centre Canada, and the Public Service Award from the Canadian Federal Government. Dr. Wang is an IEEE Distinguished Lecturer and a Senior Member of IEEE. He currently serves as an Associate Editor for IEEE Wireless Communications Letters, IEEE Transactions on Vehicular Technology and IEEE Transactions on Broadcasting. He was also an editor for IEEE Transactions on Wireless Communications between 2007 and 2011. Dr. Wang was involved in many IEEE conferences including GLOBECOM, ICC, WCNC, VTC, and ICME, in different roles such as symposium chair, track chair, TPC and session chair.

Robert Weigel, Professor, University of Erlangen-Nuremberg, Germany

Robert Weigel was born in Ebermannstadt, Germany, in 1956. He received the Dr.-Ing. and the Dr.-Ing.habil. degrees, both in electrical engineering and computer science, from the Munich University of Technology in Germany where he respectively was a Research Engineer, a Senior Research Engineer, and a Professor for RF Circuits and Systems until 1996. During 1994 to 1995 he was a Guest Professor for SAW Technology at Vienna University of Technology in Austria. From 1996 to 2002, he has been Director of the Institute for Communications and Information Engineering at the University of Linz, Austria where, in August 1999,th he co-founded the company DICE, meanwhile split into an Infineon Technologies (DICE) and an Intel (DMCE) company which are devoted to the design of RFICs and MMICs. In 2000, he has been appointed a Professor for RF Engineering at the Tongji University in Shanghai, China. Since 2002 he is Head of the Institute for Electronics Engineering at the University of Erlangen-Nuremberg, Germany. There, respectively in 2009 and in 2012, he co-founded the companies eesy-id and eesy-ic. Dr. Weigel has been engaged in research and development of microwave theory and techniques, electronic circuits and systems, and communication and sensing systems. In these fields, he has published more than 800 papers. For his work in microwave acoustics, he received the 2007 IEEE Microwave Applications Award. Dr. Weigel is a Fellow of the IEEE, an Elected Member of the German National Academy of Science and Engineering (acatech), and an Elected Member of the Senate of the German Research Foundation (DFG). He is and has been serving on numerous advisory boards of government bodies, research institutes and companies in Europe and Asia as well as on various editorial boards such as that of the Proceedings of the IEEE, and he has been editor of the Proceedings of the European Microwave Association. He has been member of numerous conference steering and technical program committees and was Technical Program Chair of several conferences such as the 2002 IEEE International Ultrasonics Symposium in Munich, Germany as well as General Chair of several conferences such as the 2013 European Microwave Week in Nuremberg, Germany. He served in many roles for the IEEE MTT-S and UFFC-S. He has been Founding Chair of the Austrian COM/MTT Joint Chapter, Region 8 MTT-S Coordinator, Distinguished Microwave Lecturer, MTT-S AdCom Member, and the 2014 MTT-S President.

Caijun Zhong, Associate Professor, Zhejiang University, China

Caijun Zhong received the B.S. degree in Information Engineering from the Xi'an Jiaotong University, Xi'an, China, in 2004, and the M.S. degree in Information Security in 2006 and the Ph.D. degree in Telecommunications in 2010, both from University College London, London, United Kingdom. From September 2009 to September 2011, he was a research fellow at the Institute for Electronics, Communications and Information Technologies (ECIT), Queen's University Belfast, Belfast, UK. Since September 2011, he has been with Zhejiang University, Hangzhou, China, where he is currently an Associate Professor. His research interests include massive MIMO, full-duplex communications, and energy harvesting communications. Dr. Zhong is an Editor for the IEEE Transactions on Wireless Communications, the IEEE Communications Letters, the Journal of Communications and Networks, and the EURASIP Journal of Wireless Communications and Networking. He is the recipient of the 2013 IEEE ComSoc Asia-Pacific Outstanding Young Researcher Award. He and his coauthors have been awarded a Best Paper Award at the WCSP 2013.

Peiying Zhu, Director, North American Wireless Research and Standards, Huawei Technologies, Canada

Peiying Zhu is a Huawei Fellow and Senior Director of North American Wireless Research and Standards. The focus of her research is advanced wireless access technologies for LTE/LTE-A and beyond. She is currently leading 5G wireless system research in Huawei. 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 WiMAX /LTE standards and 4G products. Peiying has more than 150 granted patents in those areas. She was actively involved in IEEE 802.16 and LTE standards development, served as IEEE 802.16j Relay Task Group vice chair, various ad-hoc chairs, and IEEE 802.16 Working Group Secretary positions. She is a WiFi Alliance Board member and Treasurer. Dr. Zhu received her Ph.D. degree in electrical Engineering from Concordia University in Canada and M.S. and Ph.D. degrees in Electrical Engineering from Southeast University in China.

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InterDigital, Inc. designs and develops advanced technologies that enable and enhance mobile communications and capabilities. Since our founding in 1972, our engineers have designed and developed a wide range of innovations that are used in digital cellular and wireless products and networks, including 2G, 3G, 4G and IEEE 802-related products and networks. For over four decades, InterDigital has been a pioneer in mobile technology and a key contributor to global wireless standards. Our team of more than 170 engineers – approximately 80 percent of whom hold advanced degrees, including over 50 PhDs – has unparalleled expertise in major mobile connectivity and content delivery technologies. Since 2000, InterDigital has spent close to $1 billion on technology research and development. The company's activities are organized around the concept of the Living Network: a future where intelligent networks self-optimize to deliver service that is tailored to the content, context and connectivity of the user, device or need.

PERSWADE (http://www.create-perswade.ca)

Our mission: to build upon the very strong Montreal-based university-industry collaboration to address the specific needs and new challenges of smart applications of wireless in all sectors of the 21st-century digital economy by developing an innovative, interdisciplinary, and integrative research training program in the industrial stream.NSERC CREATE Training program in Pervasive and Smart Wireless Applications for the Digital Economy (PERSWADE) is a unique interdisciplinary industry-oriented applied research training program collaboratively supervised by top-notch researchers from five Montreal universities and ten industry partners, with upwards of M$1.6 in funding from NSERC, out of a budget of M$3.8 for 2013-2019. The PERSWADE program addresses the specific needs and new challenges arising from the pervasive and smart applications of wireless networks and systems (WNS) in the 21st-century digital economy. The research scope of the program covers three main thrusts: smart communications, smart monitoring, and smart management. The research will address challenges from various priority themes such as: Smart Agriculture, Smart Cities, Smart Disaster Prevention & Relief, Smart Electical/Hybrid Vehicles, Smart Environment Monitoring, Smart Grids, Smart Health Monitoring, Smart Homes & Offices, Smart Hospitals, Smart Manufacturing, Smart Navigation, Smart Safety & Security Monitoring, Smart Transportation Systems, Smart Underground Mining. Obviously the list above is far from being exhaustive. Actually it invites oneself to ask the following question: Can one think of any existing or emerging application sector that could not benefit from WNS to make it smart or smarter? The obvious answer highlights the upcoming wireless opportunity upon which builds PERSWADE!

WIRELESS LAB (http://wirelesslab.ca)

The Wirelesslab is located at the Energy, Materials, and Telecommunications Center of the Institut National de la Recherche Scientifique (affiliated with the University of Quebec) in the heart of Montreal. The Wirelesslab has established itself as a leading national research Lab dedicated to the analysis of Signal Processing in the global field. It has brought with that analysis a particular focus on wireless communication systems, statistical processing of multi-dimensional signals, MIMO, multi-user detection and synchronization, interference cancellation, etc. By offering a platform to pursue innovative research programs, the Wireless Lab has created a significant archive of critical knowledge to benefit students, researchers and industrials. The Wirelesslab has distinguished itself by its pioneering collaborative projects that aims to consolidate the idea of university-industry collaboration. Forged in a period of passionate discussions and studies, the Wireless Lab has recently broadened and deepened those considerations by making significant contributions in the best scientific journals. Our aim is to continue seeking for novel areas of cutting-edge research.

GOUDREAU GAGE DUBUC (http://ggd.com)

Founded in 1966, Goudreau Gage Dubuc is among the pioneers in the intellectual property field in Canada and is now one of Canada's most reputable full-service intellectual property firms. The firm consists of a team of lawyers, scientists, and patent and trade-mark agents who are highly qualified and experienced in all areas of the intellectual property practice. Goudreau Gage Dubuc is in a position to efficiently address all intellectual property matters, particularly in the fields of patents, trade-marks and domain names, industrial designs, copyrights, trade secrets, and integrated circuit topographies, as well as transfers of such rights and related litigation. Over the years, the challenges presented by new and emerging technologies have driven the evolution of our firm. From electronics and electrical engineering to telecommunications and software, we continuously define and redefine our expertise to meet these challenges. Goudreau Gage Dubuc thus provides expert advice to its clients and foresees their intellectual property needs. Goudreau Gage Dubuc's main objective is to provide effective and personalized services to its clients by adopting a strategic approach towards intellectual property. Over the years, Goudreau Gage Dubuc has built a team of professionals who offer experience, dynamism, efficiency and availability to their clients.

PROMPT (http://www.promptinc.org)
Prompt is a non-profit corporation that stimulates the creation of R&D partnerships between industry and public research institutions (universities and government research centers) in order to increase Quebec's competitive edge in the information and communications technology market. With support from the Quebec government, the government of Canada and the private sector, Prompt facilitates the creation of new alliances that broaden the R&D scope of industry (notably SMEs), stimulate private sector investment in research and foster the training of highly qualified manpower through: funding for pre-competitive R&D partnerships involving typically at least two companies and two research institutions. Prompt supports the setup of joint projects that must be completed within three years following the funding decision in order to ensure synergy with industry and relevance; the creation of new alliances between researchers and leaders from academia, industry, government, institutional and private sector investors, foremost in Quebec but also throughout Canada and internationally. Prompt is a catalyst for the creation of highly effective project teams, the expansion of innovation networks and the development of new opportunities; the identification of new, long-term opportunities for the ICT industry.

INRS (http://inrs.ca)
INRS (Institut national de la recherche scientifique) ranks first in Canada in terms of research and publication intensity. It brings together professors, researchers, graduate students, and postdoctoral fellows in its four research centres in Montreal, Quebec City, Laval, and Varennes. INRS operates with an annual budget of $115 million and receives $65 million in research grants and contracts. Conducting applied and fundamental research essential to the advancement of science in Quebec and around the world, our research teams play a critical role in finding solutions to problems facing our society. For over 40 years, INRS has contributed to science and the training of highly qualified students in sectors of great strategic importance for our society: water, earth, and environment; energy, materials, and telecommunications; human, animal, and environmental health; and urbanization, culture, and society.

CMC MICROSYSTEMS (http://www.cmc.ca)
CMC Microsystems works with researchers and industry across Canada's National Design Network, providing access to world-class tools, technologies, expertise and industrial capabilities for designing, prototyping and manufacturing innovations in microsystems and nanotechnologies. Over the past five years, more than 5,000 innovators from academia and industry have benefited from CMC-enabled infrastructure and expertise valued at $150 million. More than 700 companies have collaborated with these researchers or hired their highly trained graduates. CMC's 55 staff have more than 500 years of expertise. It is recognized worldwide for advancing R&D in micro-nano technologies and for creating next-generation innovators.

IEEE GREEN ICT (http://greenict.ieee.org)
Launched in early 2015, the IEEE Green ICT initiative's mission statement is to build a holistic approach to sustainability through ICT by incorporating green metrics throughout IEEE technical domains. Green ICT generally refers to the design and application of information and communications technologies (ICT) in order to create environmental benefits. Moreover, as ICTs are finding applications in almost every sphere of human activity, the foreseen impact of "greening by ICT" is considered to be even ultimately greater than "greening ICT" itself. Please visit greenict.ieee.org to join our Technical Community and stay connected to this important initiative.

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SYTACOM (http://www.sytacom.mcgill.ca)
SYTACom is a Regroupement stratégique funded by the FRQNT that drives collaborative ICT systems research in Quebec as measured by research output, funding, visibility, and level of activity. SYTACom supports members' research activities in order to increase collaborative communications systems research in Quebec and at the national and international levels.

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ICUWB 2016 - Preliminary Call for Papers:

The sixteenth IEEE International Conference on Ubiquitous Wireless Broadband (ICUWB 2016) will be held on 16-19 October 2016 in Nanjing, China. ICUWB is held annually, following the last change, to provide continuously an international forum for the presentation and exchange of the latest achievements and information in ultra-high frequency wireless broadband technologies and their ubiquitous fields of application in microwave, millimeter wave, and even terahertz, lightwave and optical wireless (OW) bands and related fields as shown in the Topics. Nanjing, the city whose name means "Southern Capital" has a prominent place in Chinese history and culture, having served as the capitals of various Chinese dynasties, kingdoms and republican governments dating from the 3rd century AD to 1949. October of Nanjing is a very nice time for visitors who wish to explore the ancient east culture and the mild climate.

The ICUMB 2016 welcomes prospective authors to submit technical papers of their previously unpublished work. Complete information about the electronic paper submission process will be made available soon through the conference website (under construction) http://www.icuwb2016.org/. All accepted and presented papers will be submitted for inclusion in IEEE Xplore®.

Paper Topics of Interest

Topics include and are not limited to the following technical area.

Microwave & Antenna Technologies

- Microwave, millimeter wave, terahertz, optical wireless & lightwave antennas/devices
- Channel measurements & modeling
- Field analysis and guided waves
- Microwave device modeling
- Planar passive filters and multiplexers
- Active, tunable and integrated filters
- MEMS components and technologies
- Microwave photonics
- Power amplifier devices and circuits

Communication Systems & Signal Processing

- Modulation, detection & coding
- Synchronization, equalization & time reversal
- Ranging, localization & positioning
- Multiple access schemes & radio access technologies
- Antenna-array beamforming & MIMO systems
- Massive MIMO
- Interference mitigation techniques
- Access protocols & architectures

Hardware Architectures & Implementation

- RF modules, circuits & systems
- Pulse generation & detection
- Integrated circuits design
- Radio interface architectures
- Low-power consumption techniques
- Energy-harvesting implementations

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Cognitive Radio & Cooperative Systems

- Cognitive wireless networks
- Spectrum sensing & dynamic spectrum access
- Underlay/overlay systems
- Energy-efficient cross-layer design
- Cooperative & relayed communications

Standardization & Regulatory Issues

- Spectral management
- 5G & emerging wireless standards
- Measurements for type approval
- Co-existence

New Communication Paradigms

- 5G and future communications
- Wireless cloud & access virtualization
- Green communications
- Device to device communication
- Full-duplex technologies
- Machine to machine communications (M2M)0
- Vehicle to vehicle communications (V2V), Connected Vehicle (CV)
- Internet of things (IoT)
- Communications over power lines
- Nano-communication devices, systems & networks
- Underwater acoustic (UWA) communications

Smart Monitoring & Metering

- Sensor/RF identification (RFID) systems and networks
- Remote sensing, geosensing, geomatics, etc
- Wireless personal/body area networks (WPAN/WBAN)
- Collision, ground-penetrating & through-the-wall radars
- Materials & manufacturing defects detection & characterization
- Healthcare & medical imaging
- Disaster early warning systems
- Surveillance, safety & security (e.g. traffic, mining, etc.)
- Environment, natural resources & infrastructures

Smart Management Systems

- Smart homes, cars, offices, hospitals, schools, cities, etc.
- Intelligent transportation systems (ITS), traffic fluidity
- Smart grids & renewable energies
- Sustainable economic, social & urban development
- Production, distribution & services
- Autonomous vehicular and drone technologies

Special Sessions/Workshops: We invite experts in the field to submit proposals for special sessions and workshops.

Tutorials: We invite experts in the field to submit proposals for tutorials of interest to ICUWB's audience.

Student Paper Contest: We encourage students' participation. Instructions and information on the student paper prizes and sponsors will be posted at the conference website.

Exhibits: An exhibition of technical achievements and commercial products will be held concurrently.

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