

2017 IEEE International Symposium on Personal, Indoor and Mobile Radio Communications

Engaged Citizens and their New Smart Worlds

5G Wireless Cloud IoT Sensor Networks mmWave MIMO OW D2D Green ICT
Health & Environment Safety & Security Infrastructures Natural Resources Renewable Energies
Smart Cities & Communities AR VR Immersion ITS Smart Grids Sustainable Development

IEEE pimrc'17


Perswade
Advanced Research Training in Wireless


IEEE ComSoc™
IEEE Communications Society

 IEEE

Montreal.2017 Oct.8-13

Conference Proceedings

IEEE Catalog Number: CFP17PIM-PRT
ISBN: 978-1-5386-3529-2

AT THE ROOT OF SUCCESS AND EN ROUTE WITH YOU TO FURTHER SUCCESSES



**YOUR VALUABLE
CONTRIBUTION**

A WINNING FORMULA

The NSERC CREATE Research Training Program on Pervasive and Smart Wireless Applications for the Digital Economy PERSWADE is proud of hosting and organizing the 28th IEEE PIMRC. It is equally proud of presenting to you a rich and diverse technical program that translates its core spirit and vision about interdisciplinary and transversal research on wireless techs & apps. PERSWADE is also glad of arranging for you exciting social events that reflect the festive mood of this special celebration-year edition in Montreal and Canada. It values your contribution and participation to its success, and wishes PIMRC greater successes thanks to your continuous and precious support.

info@create-perswade.ca • www.create-perswade.ca • +1.514.228.7011

INTERDIGITAL

**CREATING
THE
LIVING
NETWORK™**



info@interdigital.com • www.interdigital.com • +1.302.281.3600

Engaged Citizens and their New Smart Worlds

5G Wireless Cloud IoT Sensor Networks mmWave MIMO OW D2D Green ICT
Health & Environment Safety & Security Infrastructures Natural Resources Renewable Energies
Smart Cities & Communities AR VR Immersion ITS Smart Grids Sustainable Development

IEEE pimrc'17

Perswade
Advanced Research Training in Wireless

IEEE ComSoc™
IEEE Communications Society

IEEE

2017 IEEE International Symposium on Personal, Indoor and Mobile Radio Communications

Copyright © 2017

by the Institute of Electrical and Electronic Engineers, Inc.

All rights reserved.

Copyright and Reprint Permissions

Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854.

All rights reserved.

IEEE Catalog Number: CFP17PIM-ART (Article)
CFP17PIM-USB (USB)
ISBN: 978-1-5386-3531-5 (Article)
978-1-5386-3530-8 (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
E-mail: curran@proceedings.com

Produced by IEEE eXpress Conference Publishing
For information on producing a conference proceedings and
receiving an estimate, contact conferencepublishing@ieee.org
<http://www.ieee.org/conferencepublishing>

TABLE OF CONTENTS

Message from the General Chairs	2
Floor Plan	3
Program at a Glance	4
Committees	13
Keynote Speeches	19
Plenary Keynote Speeches	19
Workshop Keynote Speeches	20
5G Summit Keynote Speeches	22
Panels	24
Tutorials	27
Technical Sessions	37
Track 1 Sessions	37
Track 2 Sessions	47
Track 3 Sessions	49
Track 4 Sessions	55
Workshop Sessions	57
Special Sessions	63
Demo Sessions	65
Biographies of Program Organizers and Guests	67
Authors Index	96
Sponsors and Patrons	102
Patron Profiles	103
PIMRC 2018 CFP	104

MESSAGE FROM THE GENERAL CHAIR

INTERNATIONAL SYMPOSIUM ON PERSONAL, INDOOR AND MOBILE RADIO COMMUNICATIONS

Engaged Citizens and their New Smart Worlds

MONTREAL, OCTOBER 8-13, 2017

Welcome to IEEE PIMRC 2017

The 28th Annual IEEE International Symposium on Personal, Indoor and Mobile Radio Communications (IEEE PIMRC 2017) will be held at the five-star Hotel Bonaventure, Montreal, Quebec, Canada, from 8 to 13 October, 2017, under the theme “Engaged Citizens and their New Smart Worlds”; plurality in the theme meant to highlight pathways diversity in achieving harmonious aspirations owing to mankind unity.

PIMRC is one of the premier conferences in the wireless research arena and has a long history of bringing together academia, industry and regulatory bodies. Today, it has become one of IEEE Communication Society’s flagship conferences in telecommunications. On the top of a rich variety of regular technical sessions, PIMRC will include plenary keynote speech sessions and panel discussions featuring world-class innovators in wireless technologies and their ubiquitous applications, tutorials, workshops, special sessions, and demo presentations covering the most disruptive topics, as well as exciting sociocultural events meant to offer an unforgettable taste of Montreal’s distinctive joie de vivre and creativeness.

Early 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. “Autumn is a second spring when every leaf is a flower”, said Albert Camus. And there are no better city and time to experience the true meaning of this quote than Montreal during the peak of its fall foliage season in early to mid-October.

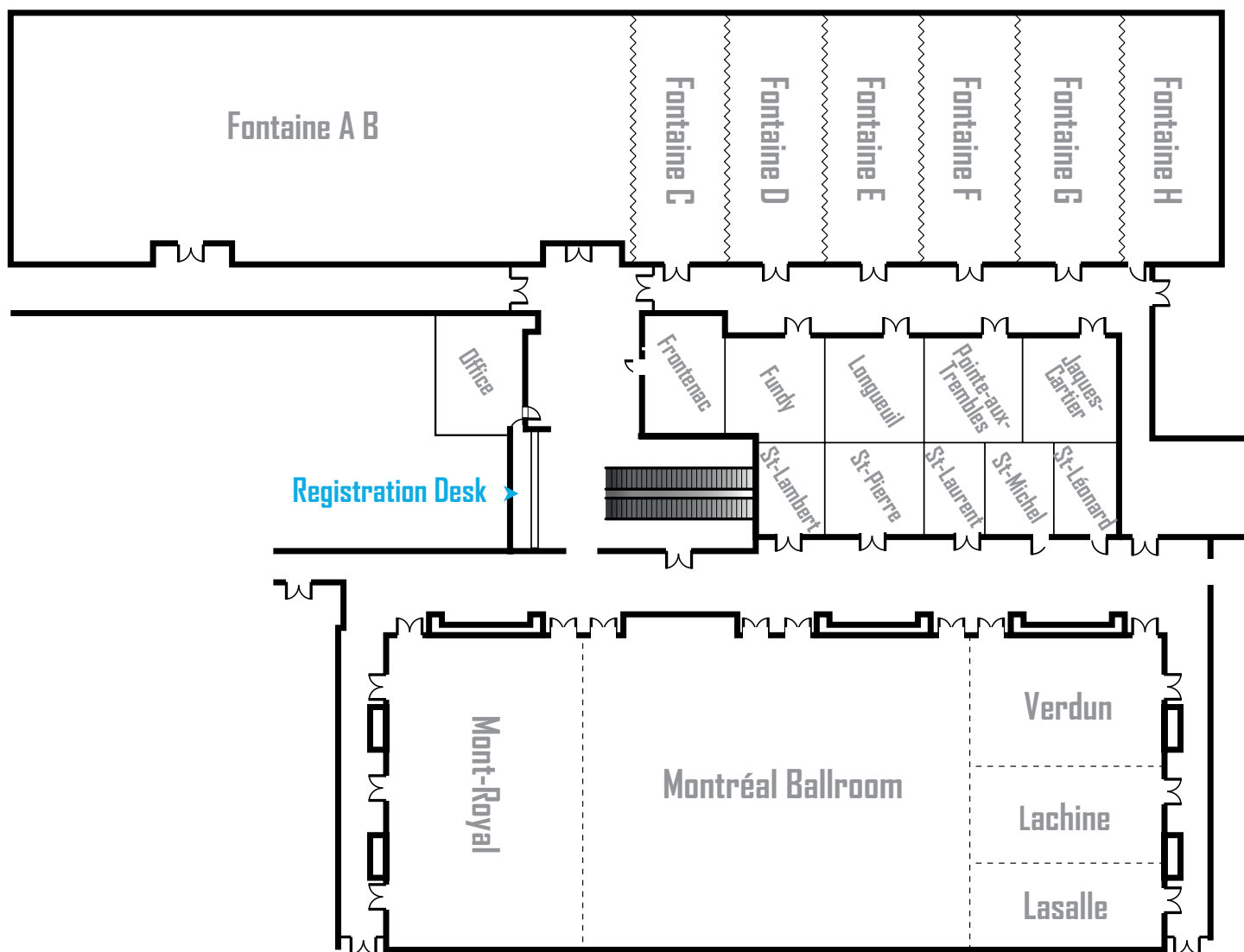
Leafs and flowers are iconic symbols of Montreal, Quebec, and Canada. And 2017, a celebration year, marks the 375th anniversary of Montreal’s founding, the 150th anniversary of Canada’s confederation, and the 50th anniversary of the 1967 World’s Fair, making IEEE PIMRC 2017 a special celebration-year edition!

Expo 67 was held in Montreal under the theme “Man and His World”, based on Saint-Exupéry’s book *Terre des Hommes* so filled with dreams and hopes for the future. Fifty years later, inspired by the same phrase found by Saint-Exupéry to express the human need for lessening isolation and for solidarity, IEEE PIMRC 2017 invites all creators of new wireless techs & apps to reflect upon it to see how it could be given tangible form by properly connecting everything wirelessly and further empowering more engaged citizens and communities in their new smart worlds of sustainable economies and digital societies.

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

Sofiène Affes
Professor, EMT Centre, INRS
Director, CREATE PERSWADE Program
affes@emt.inrs.ca / +1- 514 228-7011

FLOOR PLAN

**Hôtel Bonaventure**

900 De La Gauchetière West
Montreal, Quebec, H5A 1E4, Canada

Toll-free: +1-800-267-2575

Direct : +1-514-878-2332

PROGRAM AT A GLANCE

DAY 1, SUNDAY OCTOBER 8, 2017

Sunday 8 October							
Room	09:00-10:30	10:30-10:45	10:45-12:15	12:15-14:00	14:00-15:30	15:30-15:45	15:45-17:15
Westmount	Tutorial 1	Coffee Break	Tutorial 1	Lunch Break	Tutorial 9	Coffee Break	Tutorial 9
Outremont	Tutorial 2		Tutorial 2		Tutorial 10		Tutorial 10
Fontaine C	Tutorial 3		Tutorial 3		Tutorial 11		Tutorial 11
Fontaine D	Tutorial 4		Tutorial 4		Tutorial 12		Tutorial 12
Fontaine E	Tutorial 5		Tutorial 5		Tutorial 13		Tutorial 13
Fontaine F	Tutorial 6		Tutorial 6		Tutorial 14		Tutorial 14
Fontaine G	Tutorial 7		Tutorial 7		Tutorial 15		Tutorial 15
Fontaine H	Tutorial 8		Tutorial 8		Tutorial 16		Tutorial 16

DAY 2, MONDAY OCTOBER 9, 2017: 5G SUMMIT

Room: Verdun			
Time	Speaker	Affiliation	Talk Title
08:30-09:00	Registration		
09:00-10:30	Session I: 5G Initiative and Distinguished Keynote		
09:00-09:10	Welcome		Welcome Address
09:10-09:30			5G Initiative Talk
09:30-10:30	Yasser Nafei	Senior Vice President , LG Electronics, USA	Accelerating the Adoption of 5G by Balancing the Technical Jargon with Customer-Centric Vocabulary
10:30-11:00	AM Coffee Break		
11:00-12:30	Session II: Theme – 5G Challenges		
11:00-11:15	Muquid Ali	VP of Operations, AWTG Limited, UK	Challenges of Deploying 5G
11:15-11:30	Bosco Eduardo Fernandes	Senior Strategic Advisor, COMCON, Germany	5G the “One Size Fits it All” Technology for the Near Future?
11:30-11:45	Li Li	Senior Research Scientist, Communications Research Centre, Canada	Challenges and Innovations in Sustainable Spectrum Management for 5G
11:45-12:00	Stefano Buzzi	Associate Professor, University of Cassino and Lazio Meridionale, Italy	Putting the Citizens at the Centre of the Network: Cell-Free architectures
12:00-12:30	Panel for Session II		
12:30-14:00	Lunch Break		
14:00-15:30	Session III: Theme – 5G Architecture		
14:00-14:15	Toktam Mahmoodi	Associate Professor, King's College London, UK	Shaving the Milliseconds of Communication and Networking Protocols
14:15-14:30	Michael Starsinic	Principle Engineer , InterDigital, USA	Leveraging the Service Capability Exposure Function (SCEF) in NB-IoT Device Deployments
14:30-14:45	Faqir Zarrar Yousaf	Senior Researcher , NEC Labs, Germany	NFV/SDN: Technology Enablers for 5G - The Twain Shall Meet!
14:45-15:00	Yang Yang	Professor, SIMIT, and Director, WiCO, Chinese Academy of Sciences, China	Open 5G Platform
15:00-15:30	Panel for Session III		
15:30-16:00	PM Coffee Break		
16:00-17:30	Session IV: Theme – 5G Applications		
16:00-16:15	Stan Wong	Professor, 5G Testbed Manager, Digital Catapult, UK	5G Security in Risks and Vulnerabilities
16:15-16:30	Belkacem Mouhouche	Principal Standards Engineer, Samsung Research, UK	The Challenge of Broadcast Support in 5G Systems
16:30-16:45	Doru Calin	Director & Fellow, Nokia Bell Labs, USA	The Future X Network, A Bell Labs Perspective
16:45-17:00	Klaus David	Full University Professor, Kassel University, Germany	Is There any Room or Need for Beyond 5G: 6G Requirements
17:00-17:30	Panel for Session IV		

DAY 2, MONDAY OCTOBER 9, 2017: 5G SUMMIT AND IEEE PIMRC 2017

19:00-21:00	Montréal Ballroom	Welcome Reception (PIMRC & 5G Summit Delegates)
-------------	-------------------	---

DAY 3, TUESDAY OCTOBER 10, 2017

Time	Room	Tuesday 10 October
9:00-10:30	Montréal Ballroom	PA-01: IoT Developments in Connectivity for Industrial, Infrastructure, and Individual Applications
	Fontaine C	TR1/S01: 5G Physical Layer I
	Fontaine D	TR1/S02: NOMA
	Fontaine E	TR1/S03: Interference I
	Fontaine F	TR1/S04: Signal Processing for Wireless I
	Fundy	TR1/S05: Source/Channel Coding I
	Longueuil	TR1/S06: Channel Measurement and Modeling I
	St-Michel	TR2/S01: D2D Communications
	Fontaine G	TR3/S01: 5G Architecture
	Fontaine H	TR3/S02: UAV-Based Communications
	Jacques-Cartier	TR3/S03: Association/Selection in HetNets
	Pointe-aux-Trembles	TR4/S01: Security and Privacy for IoT
	St-Pierre	TR4/S02: Content Caching and Delivery
	St-Léonard	SP4/S01 Resource-Efficient, Reliable, and Secure IoT in the 5G Era I
	Mont-Royal	DE/S01: Demo Exhibits I
10:30-11:00	Mont-Royal	AM Coffee Break
11:00-12:00	Montréal Ballroom	Opening and Welcome Remarks
		KP-01: Plenary Keynote Speech on “An MSO Vision of the Network of the Future” by Luc Noiseux, SVP and CTSO, Cogeco, Canada KP-02: Plenary Keynote Speech on “Surviving in an Uncertain World with Slow Communication Pathways” by Thrishantha Nanayakkara, Head of the Robotics and Manufacturing Theme, Imperial College London, UK
12:00-13:30	Fontaine A-B	Lunch
13:30-15:00	Fontaine C	TR1/S07: Beamforming I
	Fontaine D	TR1/S08: Channel Estimation I
	Fontaine E	TR1/S09: Cognitive Radio
	Fontaine F	TR1/S10: D2D Communications I
	Fundy	TR1/S11: Modulation I
	Longueuil	TR2/S02: LTE and WiFi Coexistence Techniques
	St-Michel	TR2/S03: User Association and Discovery
	Fontaine G	TR3/S04: 5G Communication Protocols
	Fontaine H	TR3/S05: VANETS
	Pointe-aux-Trembles	TR3/S06: Energy Efficient/Aware Communications
	Jacques-Cartier	TR3/S07: Body Area Networks
	St-Pierre	TR4/S03: Secure Network and Service Access
	St-Léonard	SP4/S02: Resource-Efficient, Reliable, and Secure IoT in the 5G Era II
15:00-16:00	Montréal Ballroom	KP-03: Plenary Keynote Speech on “Wireless Dependable IoT/M2M for Reliable Machine Centric Sensing and Controlling of Medical Devices, Cars and Others” by Ryuji Kohno, Director, Centre of Medical ICT; and Professor, Yokohama National University, Japan
16:00-16:30	Mont-Royal	PM Coffee Break
16:30-18:00	Mont-Royal	DE/S02: Demo Exhibits II
	Fontaine C	TR1/S12: Cooperative Communications I
	Fontaine D	TR1/S13: Massive MIMO I
	Fontaine E	TR1/S14: Security I
	Fontaine F	TR1/S15: Signal Processing for Wireless II
	Longueuil	TR2/S04: Power and Energy
	Fontaine G	TR3/S08: LTE Networks
	Fontaine H	TR3/S09: Vehicular Networks
	Jacques-Cartier	TR3/S10: Energy Efficient WSNs
	Pointe-aux-Trembles	TR4/S04: Cloud and Fog Computing
	Fundy	SP1: Big Data-Enabled 5G Systems

DAY 3, TUESDAY OCTOBER 10, 2017

Time	Room	Tuesday 10 October	
WS-07 The Internet Of Things (IoT), the Road Ahead: Applications, Challenges, and Solutions			
08:30-10:30	Lachine	WS07/S01:	Welcome and Opening Remarks
			KW-01 Keynote Speech on "IoT: Multiple Facets of its Impact on the Economy and our Society" by Amit Mukhopadhyay, Group Leader - Future Wireless Networks Modeling, Bell Labs Consulting, Murray Hill, USA
10:30-13:00			IoT - Road Ahead: Apps, Challenges and Solutions I
13:00-15:00		WS07/S02:	KW-02 Keynote Speech on "5G for Smart City and Connected Industry" by Ali Khayrallah, Engineering Director, Ericsson Research, Santa Clara, USA
			IoT - Road Ahead: Apps, Challenges and Solutions II
15:00-16:30			
16:30-18:30	WS07/S03:	IoT - Road Ahead: Apps, Challenges and Solutions III	
		Closing Remarks	
WS-06 Full-Duplex Technologies (FDX 2017)			
09:00-10:30	Verdun	WS06/S01:	Full-Duplex Technologies: Interference
10:30-13:30			
13:00-15:00		WS06/S02:	KW-03 Keynote Speech on "Full-Duplex MIMO - Algorithms and PoC Performance" by Yang-Seok Choi, , Director of RSE, Wireless Architect, Intel, USA
			KW-04 Keynote Speech on "Secure Wireless Communication with Full-Duplex Radio" by Yingbo Hua, Professor, University of California, Riverside, USA
15:00-16:30			
16:30-18:00		WS06/S03:	Full-Duplex Communications: Systems and Networks
WS-09 New Radio Technologies (NR)			
08:55-10:30	Lasalle	WS09/S01:	Welcome and Opening Remarks
			New Radio Technologies I
10:30-13:30			
13:30-15:00		WS09/S02:	New Radio Technologies II
15:00-16:30			
16:30-18:00		WS09/S03:	New Radio Technologies III

DAY 4, WEDNESDAY OCTOBER 11, 2017

Time	Room	Wednesday 11 October
9:00-10:30	Montréal Ballroom	PA-02: 5G Research and System Design
	Fontaine C	TR1/S16: Beamforming II
	Fontaine D	TR1/S17: Cooperative Communications II
	Fontaine E	TR1/S18: Positioning, Localization, and Tracking I
	Fontaine F	TR1/S19: Security II
	Fundy	TR1/S20: Signal Processing for Wireless III
	Longueil	TR2/S05: Delay and Latency
	St-Michel	TR3/S11: Spectrum Management/Coexistence
	Fontaine G	TR3/S12: Vehicle-Assisted Communications and Services
	Fontaine H	TR3/S13: Routing
	Jacques-Cartier	TR3/S14: Resource Allocation in HetNets
	Pointe-aux-Trembles	TR4/S05: Smart Homes, Factories, and Cities
	St-Pierre	TR4/S06: 5G Network Management
	St-Léonard	SP3/S01: Advanced Antennas for 5G I
	Mont-Royal	DE/S03: Demo Exhibits III
10:30-11:00	Mont-Royal	AM Coffee Break
11:00-12:00	Montréal Ballroom	KP-04: Plenary Keynote Speech on “ Decentralization: The Next Revolution in Computing and Communications ” by Siavash Alamouti , President & CEO, mimik, USA
12:00-13:30	Fontaine A-B	Lunch
13:30-15:00	Ville-Marie	PA-03: Women in Science and Technology: Towards a Real Transformation
	Montréal Ballroom	PA-04: Role of Unlicensed Spectrum in Next Generation Wireless Systems
	Fontaine C	TR1/S21: 5G Physical Layer II
	Fontaine D	TR1/S22: Energy Harvesting and Power Transfer
	Fontaine E	TR1/S23: Equalization, Detection, and Signal Processing
	Fontaine F	TR1/S24: Interference II
	Fundy	TR1/S25: Massive MIMO II
	St-Michel	TR1/S26: Source/Channel Coding II
	Longueil	TR2/S06: Cross-Layer and WLANs
	Fontaine G	TR3/S15: Next Generation Wireless Networks
	Fontaine H	TR3/S16: Self-Organized Networks
	Pointe-aux-Trembles	TR3/S17: Scheduling/Admission Control
	St-Pierre	TR4/S07: Location-based Services and Applications
	St-Léonard	SP3/S02: Advanced Antennas for 5G II
	Jacques-Cartier	SP5/S01: 5G Wireless Technologies for V2X I
15:00-16:00	Montréal Ballroom	KP-05: Plenary Keynote Speech on “ The Wireless Seat Belt: An Innovative Approach for Car2P/VRU Safety Based on 5G and Machine Learning ” by Klaus David , Professor, Kassel University, Germany
16:00-16:30	Mont-Royal	PM Coffee Break
16:30-18:00	Mont-Royal	DE/S04: Demo Exhibits IV
	Montréal Ballroom	PA5: Urban Connectivity: Challenges and Opportunity
	Fontaine C	TR1/S27: Channel Estimation II
	Fontaine D	TR1/S28: D2D Communications II
	Fontaine E	TR1/S29: mm-Wave Communications
	Fontaine F	TR1/S30: Modulation II
	Fundy	TR1/S31: PHY-Layer Designs Under Practical Constraint
	Longueil	TR2/S07: IoT and Ultra Dense Networks
	Fontaine G	TR3/S18: Content/Caching Aware Cellular Networks
	Fontaine H	TR3/S19: Software Defined Networking
	Jacques-Cartier	TR3/S20: Relay Networks
	Pointe-aux-Trembles	TR4/S08: Localization and Positioning
	St-Pierre	SP5/S02: 5G Wireless Technologies for V2X II
20:00-22:30	Montréal Ballroom	Banquet

DAY 4, WEDNESDAY OCTOBER 11, 2017

Time	Room	Wednesday 11 October	
WS-10 Radio Transmission Technologies with Evolution and Self-Learning Algorithms (RTT-ESLA)			
08:30-10:30	Lasalle	WS10/S01:	KW-05 Keynote Speech on "Learning to Decode" by Kai Niu, Professor, BUPT, China Full Radio with Evolution and Self Learning
WS-08 Massive MIMO/FD-MIMO in 5G Mobile Communications			
08:30-10:30	Lachine	WS08/S01:	Massive MIMO/FD-MIMO I
10:30-13:00			
		WS08/S02:	Welcome and Opening Remarks
13:00-15:00			KW-06 Keynote Speech on "Massive MIMO for the New Radio" by Frederick W. Vook, Distinguished Member of the Technical Staff, Nokia Bell Labs, USA Massive MIMO/FD-MIMO II Closing Remarks
WS-05 Personalized Mobile Applications for Smart Cities and Smart Citizens (PMA 2017)			
08:30-10:30	Verdun	WS05/S01:	Personalized Mobile Apps for Smart Cities and Citizens I
10:30-13:30			
13:30-15:00		WS05/S02:	Tutorial by Grahame Smith on "Co-Creation Technique - The User-Centric Living Labs Approach"
15:00-16:30			
16:30-18:30		WS05/S03:	Networking Session and Elevator Pitch Personalized Mobile Apps for Smart Cities and Citizens II
WS-11 V2X Channel Measurements and Modeling (WVCM 2017)			
13:30-15:00	Lasalle	WS11/S01:	Welcome and Opening Remarks KW-07 Keynote Speech on "Channel Characteristics for Cooperative ITS and Positioning" by Fredrik Tufvesson, Professor, Lund University, Sweden V2X Channel Measurements and Modeling I
15:00-16:30			
16:30-18:00		WS11/S02:	KW-08 Keynote Speech on "Observations on V2X Channel Modeling Requirements and Standards" by David Steer, Staff Engineer, Huawei Canada Research Centre, Canada V2X Channel Measurements and Modeling II Closing Remarks

DAY 5, THURSDAY OCTOBER 12, 2017

Time	Room	Thursday 12 October
9:00-10:30	Fontaine C	TR1/S32: 5G Physical Layer III
	Fontaine D	TR1/S33: Channel Estimation III
	Fontaine E	TR1/S34: Massive MIMO III
	Fontaine F	TR1/S35: Modulation III
	Fundy	TR1/S36: Signal Processing for Wireless IV
	Longueil	TR1/S37: Optical Wireless I
	St-Michel	TR2/S08: Advanced Techniques
	Fontaine G	TR3/S21: Evaluation of Communications Protocols
	Fontaine H	TR3/S22: Learning Algorithms in Networks
	Jacques-Cartier	TR3/S23: Power Management/Awareness
	Pointe-aux-Trembles	TR3/S24: Security, Privacy, and Secrecy
	St-Pierre	TR4/S09: Wireless Emerging and Multimedia Services
	St-Laurent	TR4/S10: Machine Learning and Data Analytics
	Lasalle	WS04 - TR4/S11: Economics of Wireless Virtualization (Joint Session)
	St-Léonard	SP6/S01: Mission-Critical Communications I
	Mont-Royal	DE/S05: Demo Exhibits V
10:30-11:00	Mont-Royal	AM Coffee Break
11:00-12:00	Montréal Ballroom	KP-06: Plenary Keynote Speech on "Building the Road to 5G" by Javan Erfanian, Chief Editor, NGMN 5G Initiative; and Distinguished Member of Technology, Wireless Technology Strategy, Bell Canada
12:00 - 13:30	Fontaine A-B	Lunch
13:30 - 15:00	Fontaine C	TR1/S38: Cooperative Communications III
	Fontaine D	TR1/S39: Massive MIMO IV
	Fontaine E	TR1/S40: Positioning, Localization, and Tracking II
	Fontaine F	TR1/S41: Security III
	Fundy	TR1/S42: Synchronization
	St-Michel	WS03 - TR1/S43: Coexisting Radio and Optical Wireless (Joint Session)
	Longueil	TR2/S09: Resource Allocation I
	Fontaine G	TR3/S25: M2M, D2D, and MANETs
	Fontaine H	TR3/S26: Data Sensing, Aggregation, and Diffusion
	Pointe-aux-Trembles	TR3/S27: Interference/Collision Aware Communications
15:00-16:00	St-Pierre	TR4/S12: Network Virtualization and Management I
	St-Léonard	SP6/S02: Mission-Critical Communications II
15:00-16:00	Montréal Ballroom	KP-07: Plenary Keynote Speech on "Multiple Access for 5G – Challenges Ahead" by Hikmet Sari, Chief Scientist, Sequans Communications; and Professor, NUPT, China
16:00 - 16:30	Mont-Royal	PM Coffee Break
16:30 - 18:00	Fontaine C	TR1/S44: 5G Physical Layer IV
	Fontaine D	TR1/S45: Channel Measurement and Modeling II
	Fontaine E	TR1/S46: Performance Analysis
	Fontaine F	TR1/S47: Signal Processing for Wireless V
	Fundy	TR1/S48: Optical Wireless II
	Longueil	TR2/S10: Resource Allocation II
	Fontaine G	TR3/S28: Satellite, mm-Wave, and LiFi Communications
	Fontaine H	TR3/S29: Networks and Computing
	Pointe-aux-Trembles	TR4/S13: Network Virtualization and Management II
	Jacques-Cartier	SP2: Software-Defined Edge Computing in Smart Cities

DAY 5, THURSDAY OCTOBER 12, 2017

Time	Room	Thursday 12 October	
WS-04 The Economics of Wireless Network Virtualization			
08:30-10:30	Lasalle	WS04 - TR4/S11:	Welcome and Opening Remarks KW-09 Keynote Speech on "Wireless Network Virtualization, Business Opportunities and Economic Aspects" by Toktam Mahmoodi, Associate Professor, King's College London, United Kingdom Economics of Wireless Virtualization (Joint Session)
WS-03 Coexisting Radio and Optical Wireless Deployments (CROWD 2017)			
13:30-15:00	St-Michel	WS03 - TR1/S43:	Coexisting Radio and Optical Wireless (Joint Session)
WS-01 Communication for Networked Smart Cities (CORNER)			
08:30-10:30	Verdun	WS01/S01:	Communications for Networked Smart Cities I
10:30-13:00			
13:00-15:00		WS01/S02:	KW-10 Keynote Speech on "Efficient Coding for Cloud Storage" by Masoud Ardakani, Professor, University of Alberta, Canada Communications for Networked Smart Cities II
15:00-16:30			
16:30-18:00		WS01/S03:	Communications for Networked Smart Cities III
WS-02 Cognitive Radio and Innovative Spectrum Sharing Paradigms for Future Networks (CRAFT 2017)			
9:00-10:30	Lachine	WS02/S01:	Welcome and Opening Remarks Talk by Oliver Holland on "Thoughts on Database-Driven Spectrum Sharing for 5G" Fifth-Generation Networks
10:30-13:30			
13:30-15:00		WS02/S02:	Resource Allocation and Access
15:00-16:30			
16:30-18:00		WS02/S03:	Context and Constraints Discussion on Conclusions and Observations/Take-Aways from the Workshop



EdgeHaul™ - Enabling the Path to 5G

InterDigital's EdgeHaul delivers LTE-A and 5G ready Gbps transport using low-cost design concepts. Designed for street furniture and lampposts, EdgeHaul nodes can be installed in minutes and use automated beam-steering for configuration and optimization. It is the world's first self-organizing millimeter wave GBps transport system featuring adaptive phased array beam forming technology.

INTERDIGITAL

www.interdigital.com

COMMITTEES

ORGANIZING COMMITTEE

General Chair

Sofiène Affes
INRS-EMT
Canada

TPC Co-Chairs

Kaibin Huang
Univ. Hong Kong
Hong Kong

Geert Leus
Delft Univ. Techno.
The Netherlands

Shahrokh Valaee
UofT
Canada, (*Lead Co-Chair*)

Patronage Co-Chairs

Tarek Djerafi
INRS-EMT
Canada

Roch Glitho
Concordia Univ.
Canada

Awards Chair

Vijay Bhargava
UBC
Canada

Tutorials Co-Chairs

David Gesbert
EURECOM
France

Stefan Parkvall
Ericsson
Sweden

Keynotes Chair

Lajos Hanzo
Univ. Southampton
UK

Local Arrangements Co-Chairs

Tayeb Denidni
NRS-EMT
Canada

Serge Tatu
NRS-EMT
Canada

Finance Chair

Abdelaziz Samet
INRS-EMT
Canada

Publicity Co-Chairs

Mustapha Benjillali
INPT
Morocco

Daniel da Costa
UFC
Brazil

Octavia Dobre
MUN
Canada

Lutz Lampe
UBC
Canada

Yifeng Zhou
CRC
Canada

Panels Co-Chairs

Benoît Pelletier
InterDigital
Canada

Tarik Taleb
Aalto Univ.
Finland

Workshops Co-Chairs

Wei Yu
UofT
Canada

Peiyong Zhu
Huawei
Canada

Special-Sessions Co-Chairs

Mohamed Ibnkahla
Carleton Univ.
Canada

Xianbin Wang
UWO
Canada

Demos & Exhibition Co-Chairs

Peng Hu
Seneca
Canada

Kamran Sayrafian
NIST
USA

Web Admins

Mohamed Guadane
INRS-EMT
Canada

Souheib Ben Amor
INRS-EMT
Canada

International Advisors

Slim Alouini
KAUST (Middle East & Africa)
Saudi Arabia

Khaled Ben Letaief
HKUST (Asia & Pacific)
Qatar

Robert Heath
Univ. Texas Austin (Americas)
USA

Robert Schober
Erlangen-Nürnberg (Europe)
Germany

STEERING COMMITTEE

Hamid Aghvami
King's College
UK

Luis M. Correia
Univ. Lisbon
Portugal

Roberto de Marca
PUC-Rio
Brazil

Shuzo Kato
Tohoku Univ.
Japan

Kaveh Pahlavan
WPI
USA

TRACK CO-CHAIRS

TRACK 1: FUNDAMENTALS AND PHY

Chadi Assi
Concordia Univ.
Canada

Ali Ghayeb (Lead Co-Chair)
TAMUQ
Qatar

Hamid Jafarkhani
Univ. California Irvine
USA

Meryem Simsek
Tech. Univ. Dresden
Germany

Sheng Zhou
Tsinghua Univ.
China

TRACK 2: MAC AND CROSS-LAYER DESIGN

Harpreet Dhillon
Virginia Tech
USA

Antonio Marques
King Juan Carlos Univ.
Spain

Wing Kwan Ng
Univ. New South Wales
Australia

Catherine Rosenberg (Lead Co-Chair)
Univ. Waterloo
Canada

TRACK 3: MOBILE AND WIRELESS NETWORKS

Witold Krzymien
Univ. Alberta
Canada

Sameh Sorour
Univ. Idaho
USA

Elvino Sousa (Lead Co-Chair)
UofT
Canada

Kamel Tourki
Huawei
France

TRACK 4: SERVICES, APPLICATIONS AND BUSINESS

Carol Fung
Virginia Commonwealth Univ.
USA

Jemin Lee
DGIST
South Korea

Victor Leung (Lead Co-Chair)
Philips Research
Canada

Ashish Pandharipande
Tech. Univ. Dresden
The Netherlands

COMMITTEES

TECHNICAL PROGRAM COMMITTEE

Antonio A.F. Loureiro (TR3, TR4)	Roc Berenguer (TR1)	Feng-Tsun Chien (TR3)	Telmo R. Fernandes (TR1)	Ruisi He (TR1)
Mohamed M. Abdallah (TR3)	Antoine O. Berthet (TR1)	Chi-Yuk Chiu (TR1)	Mohamed Amine Ferrag (TR3)	Jianhua He (TR3)
Fatma Abdelkefi (TR3)	Christian Bettstetter (TR4)	A. Chockalingam (TR2)	Gianluigi Ferrari (TR1)	Fabien Hélot (TR1)
Javad Abdoli (TR1)	André-Luc Beylot (TR2)	Wan Choi (TR1)	Ramon Ferrús (TR3)	Michael Hempel (TR3)
Mohammad Abdul Azim (TR3)	Gautam Bhanage (TR2, TR4)	Jaehyuk Choi (TR2)	Inbar Fijalkow (TR1)	Laurent Herault (TR1)
Chadi Abou-Rjeily (TR1)	Manav Bhatnagar (TR1)	Peter Han Joo Chong (TR4)	Mark F. Flanagan (TR1)	Marco Hernandez (TR3, TR4)
Neda Aboutorab (TR3)	Kaigui Bian (TR2)	Vinod Choyi (TR4)	Bernard Henri Fleury (TR1)	Carlos Herranz (TR1)
Melchiorre Danilo Abrignani (TR3)	Emil Björnson (TR1)	Wei-Ho Chung (TR1)	Luca Foschini (TR4)	Martin Heusse (TR2)
Murad Abusubaih (TR3)	Fernando Boavida (TR3)	Ertugrul Necdet Ciftcioglu (TR2)	Magnus Frodigh (TR3)	Victor Manuel Hinostroza (TR4)
Nadjib Achir (TR3)	Vivek A Bohara (TR1)	Marcello Cinque (TR3)	Qiang Fu (TR2)	Ivan Wang-Hei Ho (TR1)
Ali Afana (TR3)	Patrick-Benjamin Bök (TR3)	Laurent Clavier (TR1)	Weihuang Fu (TR3)	Roger Pierre Fabris Hoefel (TR1, TR2)
Fatemeh Afghah (TR1)	Ernst Bonek (TR1)	Thorsten Clevorn (TR1)	Kazuhiko Fukawa (TR1)	Daesik Hong (TR1)
Hossam Afifi (TR3)	David Bonnefoy (TR4)	Sinem Coleri Ergen (TR4)	Deepak G c (TR4)	Jun-Pyo Hong (TR4)
Ramón Agüero (TR3)	Fernando Boronat (TR3)	Américo Correia (TR1)	Haris Gacanin (TR1)	Xiaolin Hou (TR1)
Rui L Aguiar (TR3)	Faouzi Bouali (TR3)	Xavier Costa-Perez (TR2)	Davy P Gaillot (TR1)	Chia-Chang Hu (TR1)
Ayaz Ahmad (TR2)	Zied Bouida (TR1, TR3)	Matthieu Crussière (TR2)	Atílio Gameiro (TR1)	Han Hu (TR3)
Syed Hassan Ahmed (TR3)	Christos J Bouras (TR4)	Felipe A. Cruz-Pérez (TR3)	Xiaoying Gan (TR3)	Jun Hu (TR4)
Abdeldjalil Aïssa-El-Bey (TR1)	Timo Bräysy (TR3)	Felix Cuadrado (TR4)	Xiang Gao (TR1)	Xiping Hu (TR4)
Ozgur B. Akan (TR2, TR4)	Raffaele Bruno (TR2)	Qimei Cui (TR1)	Zhenzhen Gao (TR1)	Gaofei Huang (TR1)
Fatih Alagöz (TR4)	Shengrong Bu (TR4)	Marília Curado (TR3)	Yue Gao (TR3)	Yangcheng Huang (TR3)
Amr Alasaad (TR4)	Nicola Bui (TR3)	Andreas Czyliw (TR1)	Ana Belén García Hernando (TR2)	Shinsuke Ibi (TR1)
Waleed Alasmari (TR3)	Enrico Buracchini (TR4)	Daniel Benevides da Costa (TR1)	Rosario G. Garroppo (TR2)	Ichirou Ida (TR4)
Arafat Al-Dweik (TR1)	Chiara Buratti (TR3)	Ron Dabora (TR3)	Matthieu Gautier (TR1)	Muhammad Ali Imran (TR1)
Marcelo S. Alencar (TR3)	Alister G. Burr (TR1)	Hamza Dahmouni (TR3)	Amjad Gawanmeh (TR3)	Ali Imran (TR1, TR3)
Irene Alepuz (TR1)	Antonio J. Caamaño (TR2)	Armin Dammann (TR1)	Xin Ge (TR4)	Mamiko Inamori (TR1, TR2)
Attahiru Alfa (TR3)	Jorge Cabrejas (TR1)	Donatella Darsena (TR3)	Yacine Ghamri-Doudane (TR2)	Minoru Inomata (TR1)
Giuseppa Alfano (TR1)	Lin X. Cai (TR3)	Carl J. Debono (TR3)	Alireza Ghasempour (TR2, TR3)	Muhammad Ismail (TR3)
Masoud Alghoniemy (TR1)	Wei Cai (TR4)	Bruce DeBruhl (TR3)	Sonia Gimenez (TR1)	Kohji Itoh (TR1)
Mohamad Yusoff Alias (TR3)	Daniel Calabuig (TR2)	Panagiotis Demestichas (TR3, TR4)	Tolga Girici (TR1, TR2, TR4)	Zubeir Izaruku (TR1, TR2)
Nancy Alonistioti (TR3)	Rafael F. S. Caldeirinha (TR1)	Subhrakanti Dey (TR1)	Apostolos Gkamas (TR4)	Nima Jamaly (TR1)
Fawaz Al-Qahtani (TR1)	Cristina Cano (TR2)	Paolo Dini (TR3)	Athanasios Gkellias (TR2)	Chitra Javali (TR4)
Slawomir J. Ambroziak (TR1)	Augusto J. D. Casaca (TR3)	Rui Dinis (TR1)	Ramy Gohary (TR2)	Tomaz Javornik (TR1)
Osama Amin (TR1, TR3)	Vicente Casares-Giner (TR2)	Soufiene Djahel (TR3)	Jean-Marie Gorce (TR1)	Anxiao Andrew Jiang (TR3)
Prasanth Ananth (TR2)	Dajana Cassioli (TR1)	Mqhele E. Dlodlo (TR1)	Javier Gozálvez (TR2, TR3)	Yanxiang Jiang (TR3)
John B Anderson (TR1)	Luis Castedo (TR1)	Jian Du (TR1)	Annie Gravey (TR3)	Qi Jiang (TR4)
Khoirul Anwar (TR1)	Anas Chaaban (TR3)	Yuhuan Du (TR3)	Ke Guan (TR1)	Shi Jin (TR1)
Daisuke Anzai (TR3)	Kok Keong Chai (TR4)	Qinghe Du (TR3)	Zhangyu Guan (TR3)	Yindi Jing (TR1, TR3)
Kamran Arshad (TR3)	Ronald Y. Chang (TR1)	Andrzej Duda (TR2, TR3)	Paulo R. Guardieiro (TR2)	Badii Jouaber (TR3)
Takuya Asaka (TR4)	Ben-Jye Chang (TR2)	Ozlem Durmaz Incel (TR2)	Xiang Gui (TR1)	Peter Jung (TR1, TR3)
Gerd H. Ascheid (TR1)	Zheng Chang (TR3)	Aveek Dutta (TR2)	Wael Guibene (TR3)	Markku Juntti (TR1)
Mohamad Assaad (TR2)	Themistoklis Charalambous (TR2)	George Efthymoglou (TR1, TR3)	Luis Guijarro (TR4)	Emmanouil N. Kafetzakis (TR3)
Georgia E. Athanasiadou (TR1)	Periklis Chatzimisios (TR2)	Ahmed El Shafie (TR3)	Fabrice M. Guillemin (TR2)	Dimitra I Kaklamani (TR1)
Edward Au (TR1)	Shih-Yuan Chen (TR1)	Ghais El Zein (TR1)	Alexandre Guitton (TR2, TR3)	Alexandros Kaloxylas (TR3, TR4)
Dimitrios Axiotis (TR1)	Huifang Chen (TR1)	Tamer ElBatt (TR2)	Mesut Günes (TR3)	Georgios Kambourakis (TR3)
Fulvio Babich (TR2)	Pingping Chen (TR1)	Hesham ElSawy (TR3)	Anubha Gupta (TR1)	Inês Kammoun (TR1)
Abdelmalik Bachir (TR2)	Yejian Chen (TR1)	Amr El-Sherif (TR3)	Gurkan Gur (TR2)	Athanasios G. Kanatas (TR1)
Ashraf Badawi (TR1)	Xiaoming Chen (TR2)	Mohamed El-Tarhuni (TR1)	M. Cenk Gursay (TR1)	Megumi Kaneko (TR2)
Dragana D. Bajic (TR1)	Kwang-Cheng Chen (TR3)	Samy S. El-Tawab (TR3)	Carlos A. Gutiérrez (TR1)	Vasileios M. Kapinas (TR1)
Adrish Banerjee (TR1)	Xianfu Chen (TR3)	Ozgur Erceetin (TR4)	Jeongseok Ha (TR1)	Holger Karl (TR2)
Ejder Bastug (TR3)	Xiang Chen (TR3)	Benoit Escrig (TR1, TR2)	Stathes Hadjiefthymiades (TR4)	Elli Kartsakli (TR3)
Tuncer Baykas (TR1, TR2)	Cheng Chen (TR3)	Mohsen Eslami (TR3)	Lars Haering (TR1)	Heikki Karvonen (TR3)
Alessandro Bazzi (TR3)	Yuanzhu Chen (TR3)	Jiancun Fan (TR1)	Hela Hakim (TR3)	Babak Hossein Khalaj (TR1)
Boris Bellalta (TR2)	Zheng Chen (TR4)	Wei Fan (TR1)	Jyri Hämäläinen (TR3)	Hyoil Kim (TR2)
Paolo Bellavista (TR3)	Min Chen (TR4)	Pingyi Fan (TR2, TR3)	Matti Hämäläinen (TR4)	Su Min Kim (TR2)
Faouzi Bellili (TR1)	Yue Chen (TR4)	Zhong Fan (TR3)	Heikki Hämäläinen (TR4)	Dong-Seong Kim (TR3)
Sana Ben Jemaa (TR3)	Julian Cheng (TR1)	Yi Fang (TR1)	Soumaya Hamouda (TR3)	Kazuhiko Kinoshita (TR4)
Mats Bengtsson (TR1)	Ray-Guang Cheng (TR2)	Syed Faraz Hasan (TR4)	Zhu Han (TR2, TR3)	Anja Klein (TR1)
Nevio Benvenuto (TR3)	Pascal Chevalier (TR1)	Fatemeh Fazl (TR3)	Shengqian Han (TR4)	Adrian Kliks (TR1)
Mehdi Bennis (TR3)	Kaikai Chi (TR4)	Afef Feki (TR3)	Shinsuke Hara (TR3)	Youngwook Ko (TR1)
Carlos J. Bernardos (TR3)	Marco Chiani (TR3)	Wei Feng (TR1)	Cengiz Hasan (TR4)	Haneul Ko (TR4)
Olivier Berder (TR1, TR2)	Mihaela I. Chidean (TR2)	Nuwan S. Ferdinand (TR2)	Fumihiko Hasegawa (TR1)	

Sastry Kompella (TR2)	Francisco J. Martinez (TR3)	Eiji Okamoto (TR4)	Michele Rossi (TR2)	Yutaka Takahashi (TR3)
Georgios Kormentzas (TR3)	David Martín-Sacristán (TR1)	Akihiro Okazaki (TR1)	Javier Rubio-Loyola (TR4)	Tarik Taleb (TR4)
Ibrahim Korpeoglu (TR3)	Kazuki Maruta (TR1)	Derrick Wing Kwan Ng (TR2)	Luca Rugini (TR1)	Peyman TalebiFard (TR4)
Erdem Koyuncu (TR1)	Philippe Mary (TR1)	Ertan Onur (TR3)	Yao Rugui (TR1)	Hirokazu Tanaka (TR2)
Ghassan M. Kraidy (TR1)	Barbara M Masini (TR1)	Pål Orten (TR1)	Walid Saad (TR1)	Ravi Tandon (TR3)
Srdjan Krco (TR4)	Marja Matinmikko (TR3)	Shumao Ou (TR3)	Harri Saarnisaari (TR1, TR3)	Jianhua Tang (TR3)
Rafał Krenz (TR1)	Michail Matthaiou (TR1)	Kazuyuki Ozaki (TR1)	Claudio Sacchi (TR2)	Suhua Tang (TR3)
Michał Krol (TR3)	Maximilian Matthé (TR1)	Pasquale Pace (TR3)	Ali Sadri (TR1)	Visa Tapio (TR3)
Dimitri Kténas (TR1)	Bill McCormick (TR4)	Sangheon Pack (TR3)	Oriol Sallent (TR3)	Daniele Tarchi (TR3)
Xavier Lagrange (TR2)	Sami Mekki (TR3)	Athanasios D. Panagopoulos (TR1)	Konstantinos Samdanis (TR3)	Werner G. Teich (TR1)
I-Wei Lai (TR1)	Jordan Melzer (TR3)	Christos Panayiotou (TR3)	Abed Ellatif Samhat (TR3)	Chintha Tellambura (TR1, TR3)
Buon Kiong Lau (TR1)	Luciano Leonel Mendes (TR1)	Qixiang (Kevin) Pang (TR4)	Yukitoshi Sanada (TR4)	Michel Terré (TR1)
Tuan Anh Le (TR1, , TR4)	Pedro Merino (TR4)	Dimitri Papadimitriou (TR3)	Jaime Sanchez-Garcia (TR1)	Fabrice Théoleyre (TR2)
Dudier Le Ruyet (TR1)	Angelos Michalas (TR4)	Panagiotis Papadimitriou (TR4)	Luca Sanguinetti (TR3)	Guiyun Tian (TR3)
Juyul Lee (TR1)	David G. Michelson (TR1)	Homer Papadopoulos (TR4)	Cesar A Santivanez (TR3)	Daxin Tian (TR4)
Ming-Chun Lee (TR1)	Konstantin Mikhaylov (TR3)	Frank Oldewurtel (TR2)	Muris Sarajlic (TR1)	Stefano Tomasini (TR3)
Yinman Lee (TR1)	Patrick Mitran (TR2)	Ki-Hong Park (TR1)	Mamoru Sawahashi (TR1)	Antti Tölli (TR1)
Jang-Won Lee (TR2)	Klaus Moessner (TR3, TR4)	Nikolaos Pappas (TR2)	Neetesh Saxena (TR4)	Kamel Tourki (TR3)
Jong-Hyook Lee (TR3)	Ehab Mahmoud Mohamed (TR1)	Hyunggon Park (TR3)	Gregor Schiele (TR4)	Elias S. Tragos (TR3)
Jung Hoon Lee (TR4)	Lahby Mohamed (TR3)	Pangun Park (TR4)	Anke Schmeink (TR1)	Ramona Trestian (TR1)
Xianfu Lei (TR1)	Amr Mohamed (TR4)	Bahar Partov (TR3)	Johannes Schmitt (TR4)	Dionysia Triantafyllou (TR4)
Ka-Cheong Leung (TR4)	Parthajit Mohapatra (TR4)	Kyung-Joon Park (TR2)	Stefano Secci (TR2)	Peter Trifonov (TR1)
Jun Li (TR1)	Antonella Molinaro (TR3)	Tuomas Paso (TR2)	Karim G Seddik (TR1, TR3)	Dirk Trossen (TR4)
Hui Li (TR1)	Gianluca Monaci (TR4)	Nikos Passas (TR2, TR3)	Boon-Chong Seet (TR4)	Shiao-Li Tsao (TR3)
Boyu Li (TR1)	Reza Monir Vaghefi (TR4)	Antonio M. Peinado (TR4)	Stephane Senecal (TR3)	Eng Tseng Lau (TR4)
Ying Li (TR1)	Francisco A. Monteiro (TR1)	Custodio Peixeiro (TR1)	Shamik Sengupta (TR4)	George Tsoulos (TR1)
Huan-Bang Li (TR2)	Paulo Montezuma (TR1)	Yang Peng (TR4)	Sidi-Mohammed Senouci (TR3)	Pere Tuset-Peiro (TR2)
Rongpeng Li (TR3)	Nektarios Moraitis (TR1)	Zheng Peng (TR4)	António Serrador (TR3)	P Ubaidulla (TR1)
Jian Li (TR3)	Antoni Morell (TR2)	Kai Peng (TR4)	Babak Seyfe (TR4)	Emmanouel Varvarigos (TR3)
Husheng Li (TR4)	Eduardo Morgado (TR2)	Tommaso Pecorella (TR2)	Kaveh Shafiee (TR4)	Emmanouil Vasilomanolakis (TR4)
Qiang Li (TR4)	Simone Morosi (TR1, TR3)	Samir M. Perlaza (TR3)	Hamed Shah-Mansouri (TR4)	Fernando J. Velez (TR1, , TR4)
Jie Li (TR4)	David Mottier (TR1)	Jordi Pérez-Romero (TR2)	Shree Krishna Sharma (TR1)	Véronique Vèque (TR3)
Xi Li (TR4)	Hassnaa Moustafa (TR3)	Stephan F. Pfletschinger (TR1)	Gvv Sharma (TR1)	Roberto Verdone (TR3)
Xue Jun Li (TR4)	Lorenzo Mucchi (TR1)	Raphael C.-W. Phan (TR3)	Zhengguo Sheng (TR4)	Christos Verikoukis (TR3)
Weifa Liang (TR3, TR4)	Naveed Mufti (TR1)	Paulo F Pinto (TR3)	Ray E Sheriff (TR3)	Quoc-Tuan Vien (TR1)
Wei-Shun Liao (TR1)	Sami Muhaidat (TR1)	Pekka Pirinen (TR3)	Yi Shi (TR3)	Guillaume Villemaud (TR1)
Sian-Jheng Lin (TR1)	Paul Muhlethaler (TR3)	George C. Polyzos (TR3)	Basem Shihada (TR3)	Alexey Vinel (TR2, TR3)
Yuan-Pei Lin (TR1)	Abu Hena Al Muktedir (TR4)	Dimitrie C. Popescu (TR1)	Tetsuya Shimamura (TR1)	Baptiste Vrigneau (TR1)
Ding-Bing Lin (TR1)	Axel Müller (TR3)	Charly Poulliat (TR1)	Oh-Soon Shin (TR1)	Thang Xuan Vu (TR1)
Pin-Hsun Lin (TR1)	Luis Muñoz (TR3)	Christian Prehofer (TR4)	Hyundong Shin (TR3)	Mai Vu (TR3)
Zihuai Lin (TR1)	Hidekazu Murata (TR1)	Ioannis Psaras (TR3)	Ryoichi Shinkuma (TR4)	Risto Vuoltoniemi (TR3)
Xingcheng Liu (TR1)	Maurizio Murrone (TR1)	Tony Q. S. Quek (TR1, TR3)	Mohamed Siala (TR1)	Bernhard H. Walke (TR2)
Tingting Liu (TR1)	Leila Musavian (TR1)	Jalaluddin Qureshi (TR2, TR3)	Adão Silva (TR1)	Hui-Ming Wang (TR2)
Nan Liu (TR1)	Osamu Muta (TR1)	Gulzaib Rafiq (TR1)	Oswaldo Simeone (TR2)	Lei Wang (TR2)
Ya-Feng Liu (TR1)	Chongning Na (TR1)	Md. Jahidur Rahman (TR1, TR3)	Ljiljana Simic (TR3)	Li-Chun Wang (TR2)
Yingxi Liu (TR1)	Sung Sik Nam (TR1)	B. Sundar Rajan (TR1)	Koushik Sinha (TR4)	Kun Wang (TR3)
Chenxi Liu (TR4)	Shusuke Narieda (TR1)	Nandana Rajatheva (TR3)	Daniel K. C. So (TR1)	Yue Wang (TR3)
Gianluigi Liva (TR3)	Jad Nasreddine (TR3)	David Ramírez (TR2)	Ping Jack Soh (TR1)	Lin Wang (TR3)
Jonathan Loo (TR4)	Enrico Natalizio (TR3)	Lars K. Rasmussen (TR1)	Hwangjun Song (TR3)	Xijun Wang (TR3)
Waslon Terlizzie Araujo Lopes (TR3)	Keivan Navaie (TR4)	Rouzbeh Razavi (TR3)	Liumeng Song (TR4)	Hao Wang (TR4)
David López-Pérez (TR3)	Andres Navarro (TR1)	Ahmed Refaey (TR3)	Claudio Soriente (TR3)	Xiaofei Wang (TR4)
Malamati Louta (TR3)	Moise Ndohe (TR1)	Ghaya Rekaya-Ben Othman (TR1)	Andreas Springer (TR1)	Jue Wang (TR4)
Lu Lu (TR1)	Hien Ngo (TR3)	Piotr Remlein (TR1)	Razvan Stanica (TR2)	Mea Wang (TR4)
David Malone (TR2)	Huan X Nguyen (TR1)	Markku K. Renfors (TR1)	Giovanni Stea (TR3)	Zehua Wang (TR4)
Lin Ma (TR1)	Ha Nguyen (TR3)	Mohammed Ridouani (TR3)	Corneliu Eugen D. Sterian (TR1)	Fujio Watanabe (TR4)
Dongtang Ma (TR1)	Diep N. Nguyen (TR3)	Felipe Riera-Palou (TR2)	Ioannis Stiakogiannakis (TR3)	Krzysztof Wesolowski (TR3)
Davide Macagnano (TR3)	Monica Nicoli (TR1)	Janne Riihijärvi (TR3)	Aaron D Striegel (TR3)	Christian Wietfeld (TR3, TR4)
Tatiana Madsen (TR3)	Petros Nikipolitis (TR3)	Taneli Riihonen (TR1)	Yichuang Sun (TR1)	Bernd E. Wolfinger (TR3)
Behrouz Maham (TR1)	Moslem Noori (TR1)	Vidar Ringset (TR1)	Li Sun (TR1)	Adam Wolisz (TR3)
Antonio G. Marques (TR2)	Mario S Nunes (TR3)	Herve Rivano (TR2)	Liang Sun (TR1)	Yongpeng Wu (TR2)
Naceur Malouch (TR3)	Hideki Ochiai (TR4)	Armando Rocha (TR1)	Yan Sun (TR2, TR3)	Christos Xenakis (TR4)
Lefteris Mamatras (TR4)	Tobias J. Oechtering (TR3)	António J. Rodrigues (TR1)	Ki Won Sung (TR2)	Pei Xiao (TR2)
Stefan Mangold (TR3)	Timothy O'Farrell (TR1)	Sandra Roger (TR1, TR2)	Himal A Suraweera (TR1)	Kun Xie (TR4)
Josep Mangués-Bafalluy (TR3)	Takeo Ohgane (TR1)	Christian Rohde (TR1)	Satoshi Suyama (TR1)	Animesh Yadav (TR3)
Francesco Mani (TR1)	Chikara Ohta (TR4)	Luca Rose (TR3)	Istvan Szini (TR1)	Lei Yang (TR4)
Alexander Markhasin (TR3)	Tomoaki Ohtsuki (TR1)	Mardeni Roslee (TR1)	Takuji Tachibana (TR4)	Halim Yanikomeroglu (TR3)

Xin-Wei Yao (TR4)
Raziq Yaqub (TR4)
Kok-Lim Alvin Yau (TR3)
Zhen Yu (TR1)
F. Richard Yu (TR4)
Ji-Hoon Yun (TR2)
Slim Zaidi (TR1)
Alberto Zanella (TR1, TR3)

Alessio Zappone (TR2)
Sherali Zeadally (TR3, TR4)
Yonghong Zeng (TR1)
Qing-An Zeng (TR3)
Engin Zeydan (TR4)
Jie Zhang (TR1)
Shun Zhang (TR1)
Tiankui Zhang (TR1)

Dan Zhang (TR1)
Jianhua Zhang (TR1)
Jun Zhang (TR1)
Lin Zhang (TR1)
Xin Zhang (TR1)
Yan Zhang (TR2)
Xing Zhang (TR3)
Jiayi Zhang (TR3)

Jingyuan Zhang (TR3)
Rong Zhang (TR4)
Yin Zhang (TR4)
Heli Zhang (TR4)
Xiongwen Zhao (TR1)
Kan Zheng (TR4)
Zhiyi Zhou (TR1)
Yong Zhou (TR4)

Huan Zhou (TR4)
Dengkui Zhu (TR1)
Chunsheng Zhu (TR4)
Lynda Zitouni (TR3)
Nikola Zlatanov (TR2)

DRIVING GROWTH

Unique and first in Canada, PERSWADE is an advanced research training program in wireless and its application sectors. **+**

Industrial Partners:

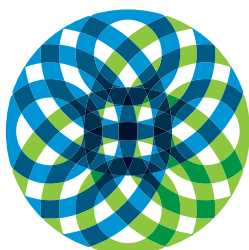
Cogeco
Ericsson
Focus Microwaves
Huawei
Institut de recherche d'Hydro-Québec
Industry Canada
InterDigital
MDA
Nutaq
Ultra Electronics

Academic Partners:



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 Centre of INRS

Lead institution:

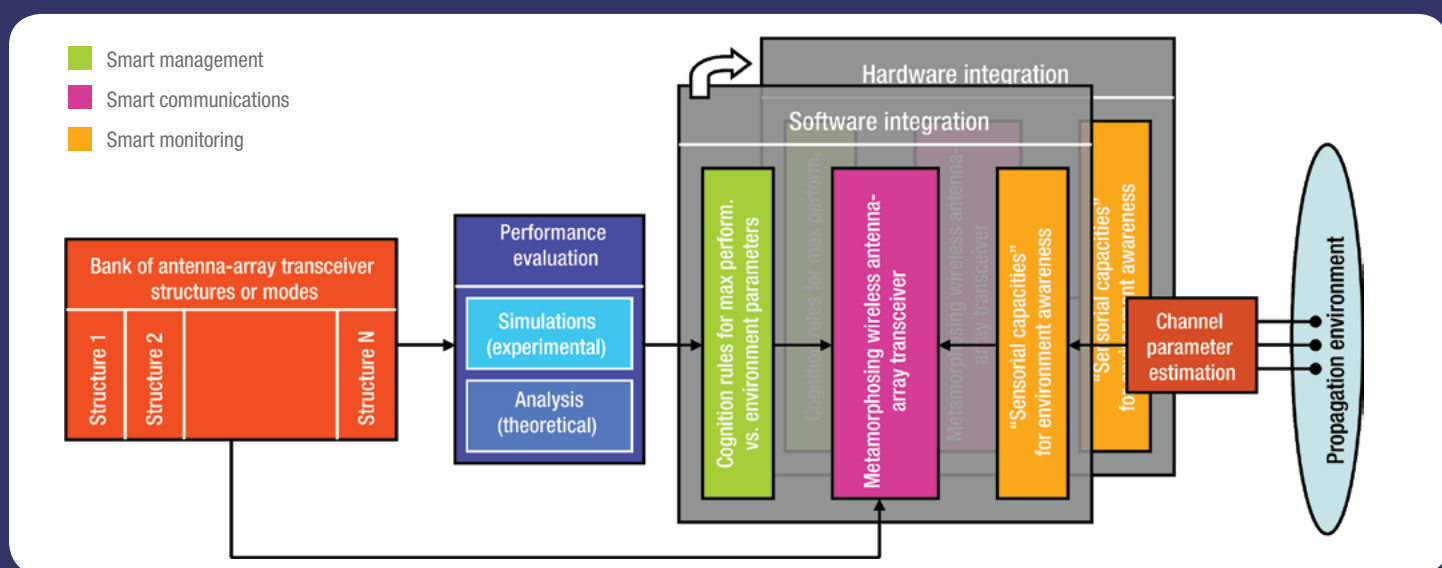
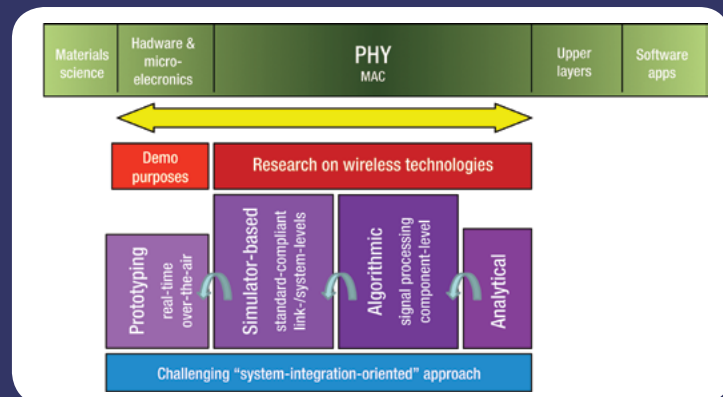


Funded by:



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 advanced 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.

KEYNOTE SPEECHES

PLENARY KEYNOTE SPEECHES

Date	Time	Room: Montréal Ballroom	
		Plenary Keynote Speaker	Keynote Speech
Tuesday 10 October	11:10-11:30	KP-01 Luc Noiseux , SVP and CTSO, Cogeco, Canada	"An MSO Vision of the Network of the Future"
	11:30-12:00	KP-02 Thrishantha Nanayakkara , Head of the Robotics and Manufacturing Theme, Imperial College London, UK	"Surviving in an Uncertain World with Slow Communication Pathways"
	15:00-16:00	KP-03 Ryuji Kohno , Director, Centre of Medical ICT; and Professor, Yokohama National University, Japan	"Wireless Dependable IoT/M2M for Reliable Machine Centric Sensing and Controlling of Medical Devices, Cars and Others"
Wednesday 11 October	11:00-12:00	KP-04 Siavash Alamouti , President & CEO, mimik, USA	"Decentralization: The Next Revolution in Computing and Communications"
	15:00-16:00	KP-05 Klaus David , Professor, Kassel University, Germany	"The Wireless Seat Belt: An Innovative Approach for Car2P/VRU Safety Based on 5G And Machine Learning"
Thursday 12 October	11:00-12:00	KP-06 Javan Erfanian , Chief Editor, NGMN 5G Initiative; and Distinguished Member of Technology, Wireless Technology Strategy, Bell Canada	"Building the Road to 5G"
	15:00-16:00	KP-07 Hikmet Sari , Chief Scientist, Sequans Communications; and Professor, NUPT, China	"Multiple Access for 5G – Challenges Ahead"

Tuesday, October 10, 11:10 – 11:30, Montréal Ballroom

KP-01 An MSO Vision of the Network of the Future

Luc Noiseux, SVP and CTSO, Cogeco, Canada

Multiple System Operators or MSOs have come a long way from their origin as distributors of TV signals. They are today at the forefront of the broadband Internet industry serving a broad segment of the population. In this keynote, Luc Noiseux shares his perspective on some of the driving forces shaping the industry as MSOs continue on their journey. Consumer trends, technological advances such as 5G, and regulatory policies form together the cornerstones of a changing environment to which MSOs are adapting by developing the network of the future. A vision of how this network might impact our lives in the future is proposed through the viewing of a short video.

Tuesday, October 10, 11:30 – 12:00, Montréal Ballroom

KP-02 Surviving in an Uncertain World with Slow Communication Pathways

Thrishantha Nanayakkara, Head of the Robotics and Manufacturing Theme, Imperial College London, UK

Telecommunication community can benefit from some findings in neuroscience and robotics. The neuroscience community has long been trying to understand how the central nervous system is managing the concurrent control of the whole body with many degrees of freedom to survive in situations that needs fast responses, but with slow communication pathways. The robotics community too has addressed the same problem of surviving in uncertain environments by efficiently solving the concurrent computation problems. In this talk, I will show some recent findings in my lab that show the physical circuits in the body work in conjunction with neural controllers to solve control problems locally. We call this phenomenon – "morphological computation" – the seamless computation that spans across neural, musculo-skeletal, and environmental circuits. I will show how we test some of these hypotheses using laboratory made robotic devices.

Tuesday, October 10, 15:00 – 16:00, Montréal Ballroom

KP-03 Wireless Dependable IOT/M2M for Reliable Machine Centric Sensing and Controlling of Medical Devices, Cars and Others

Ryuji Kohno, Director, Centre of Medical Information and Communication Technology; and Professor, Yokohama National University, Japan

In a trend of 5G and IoT, one of the most crucial demands is enhanced dependability in wireless networks to guarantee worst performance with evidence. Many of service networks such as remote medicine, autonomous car driving need such a dependable wireless network that worst and average performance can be guaranteed within a permissible range in every case but defined specific use cases. This must be an honest

and trustable manner for any stakeholders. In medical use case, wireless body area network (BAN) has been researched and developed for ubiquitous and remote medicine and its international standard IEEE802.15.6 was established but has been demanded for amendment for enhanced dependability. Interest Group (IG) in IEEE802.15 has been trying to establish a new standard for enhanced dependability for M2M or machine centric sensing and controlling of car driving and manufacturing and other use cases in which worst and average performance should be guaranteed in wireless networks for remote monitoring sensors and controlling actuators and robotics. In fact, to find missing victims and sense their vital sign at disaster spots, highly reliable and secure, i.e. dependable BAN can be applicable to a body of robots, cars, UAVs (unmanned aerial vehicle) like drones as well as a human body for dependable machine to machine (M2M) sensing and controlling. To perform precise localization and robust data communications by BAN, dependable radio technologies such as ultra wide band (UWB) radio, array antenna and error-controlling codes in physical layer must be jointly optimized with MAC, Network, and application layers. Even after BAN has been developed and standardized in global, regulatory science must be keen to guarantee safety, reliability and security to be compliant for regulation. This talk will introduce research and development, standard and regulatory compliance of dependable wireless IoT/M2M for medical, automotive, disaster resilient systems and services. IEEE802.15 international new standard group of dependable wireless networks IEEE802.15 IG-Dependability will be addressed.

Wednesday, October 11, 11:00 – 12:00, Montréal Ballroom

KP-04 Decentralization: The Next Revolution in Computing and Communications

Siavash Alamouti, President & CEO, mimik, Canada

In the last decade, mobile internet has transformed that way we live and many industries. A major technology shift in the last decade was a move from distributed computing to central cloud computing where content and applications were hosted in data centers and consumed on device on the edge. In the last few years, internet of things (IoT) has become a reality with billions of connected devices and this trend will continue its exponential growth. At the same time, devices are now embedded with cameras and sensors and a significant amount of data is now produced at the edge. For example, one self-driving car generates more than 1GBytes/sec of data which is two orders of magnitude larger than the capacity of an LTE base station and perhaps an order of magnitude larger than a 5G base station. I postulate that the only way to cope with such a drastic increase in the amount of traffic generated at the edge is decentralization and edge cloud computing. I will then highlight the requirements for edge cloud computing and challenges and opportunities of decentralization.

Wednesday, October 11, 15:00 – 16:00, Montréal Ballroom

KP-05 The Wireless Seat Belt: An Innovative Approach for CAR2P/VRU Safety Based on 5G And Machine Learning

Klaus David, Professor, Kassel University, Germany

The World Health Organization in its latest report on road safety states that more than 20% of all road traffic deaths comprise pedestrians – far more than a quarter of a million per year. Since many years the automotive industry is working on reducing this number by using passive as well as active approaches (like Camera or LIDAR based systems). Recent advances in mobile communications (LTE and 5G) and Machine Learning allow for an innovative, co-operative Car2P/VRU (car to pedestrian/ vulnerable road user) safety system, which we call Wireless Seat Belt (WSB). Starting from typical accident scenarios, the requirements for such a system, including the requirements on the wireless communications, especially latency, various architectures and an overall system solution are discussed. This includes how machine learning helps to determine the activity of the pedestrian such as walking, standing, or stepping down a curb – based on real-time sensor data of smartphones. This context information and its interpretation is a prerequisite for correcting available sensor data, e.g. increasing position accuracy and for triggering accident avoidance actions. For full acceptance of WSB there are further concerns to be considered, such as privacy protection and the prevention of false alarms. Furthermore, it will be shown, how WSB can be economically viable to various stakeholders and ideas for sustainable business cases are sketched. The keynote provides an indication, why WSB is close to an optimal solution and its advantages compared to other approaches.

Thursday, October 12, 11:00 – 12:00, Montréal Ballroom

KP-06 Building the Road to 5G

Javan Erfanian, Chief Editor, NGMN 5G Initiative; and Distinguished Member of Technology, Wireless Technology Strategy, Bell Canada

This talk will share insight on requirements, challenges, realities, roadmap, and key design principles and architectural considerations, to enable wide range of use cases with diverse requirements. A major question in this path is the notion of migration, and how the different paradigms of densification, virtualization, softwarization and cloudification come together in a service based and agile architecture. While a number of phases will remain to be realized in the context of 5G vision, a great number of research topics are essential to be investigated for this to be successful with respect to its expected capabilities, use cases, experience and impact.

Thursday, October 12, 15:00 – 16:00, Montréal Ballroom

KP-07 Multiple Access for 5G - Challenges Ahead

Hikmet Sari, Chief Scientist, Sequans Communications; and Professor, NUPT, China

Multiple access refers to the way radio resources are shared among different users. The multiple access techniques used in 2G and 3G cellular networks were time-division multiple access (TDMA) and code-division multiple access (CDMA), both being used in conjunction with single-carrier transmission. A big leap came out when WiFi and 4G cellular standards were developed. All of these networks adopted orthogonal frequency-division multiplexing (OFDM) for transmission, but they differed in the way the radio resources were shared. While WiFi continued to use conventional TDMA, WiMAX used orthogonal frequency-division multiple access (OFDMA), and 3GPP LTE used OFDMA on the downlink and single-carrier frequency-division multiple access (SC-FDMA) on the uplink. For the development of future 5G, while OFDMA and some of its variants stand up as the major technology, there are a number of proposals based on non-orthogonal multiple access (NOMA) whose basic principle is to superpose user signals and make use of serial interference cancellation at the receiver. In this talk, after giving a historical review, we will describe the basic principle of NOMA, and discuss its potential and the related challenges.

WORKSHOP KEYNOTE SPEECHES

Date	Time	Room	Workshop		Workshop Keynote Speaker	Keynote Speech
Tuesday 10 October	08:30-09:20	Lachine	WS-07	KW01	Amit Mukhopadhyay, Group Leader - Future Wireless Networks Modeling, Bell Labs Consulting, Murray Hill, USA	"IoT: Multiple Facets of its Impact on the Economy and our Society"
	13:00-14:00	Lachine	WS-07	KW02	Ali Khayrallah, Engineering Director, Ericsson Research, Santa Clara, USA	"5G for Smart City and Connected Industry"
	13:00-14:00	Verdun	WS-06	KW03	Yang-Seok Choi, Director of RSE, Wireless Architect, Intel, USA	"Full-Duplex MIMO - Algorithms and PoC Performance"
	14:00-15:00	Verdun	WS-06	KW04	Yingbo Hua, Professor, University of California, Riverside, USA	"Secure Wireless Communication with Full-Duplex Radio"
Wednesday 11 October	08:30-09:00	Lasalle	WS-10	KW05	Kai Niu, Professor, BUPT, China	"Learning to Decode"
	13:00-13:45	Lachine	WS-08	KW06	Frederick W. Vook, Distinguished Member of the Technical Staff, Nokia Bell Labs, USA	"Massive MIMO for the New Radio"
	13:40-14:30	Lasalle	WS-11	KW07	Fredrik Tufvesson, Professor, Lund University, Sweden	"Channel Characteristics for Cooperative ITS and Positioning"
	15:00-16:00	Lasalle	WS-11	KW08	David Steer, Staff Engineer, Huawei Canada Research Centre, Canada	"Observations on V2X Channel Modeling Requirements and Standards"
Thursday 12 October	08:30-09:20	Lasalle	WS-04	KW09	Toktam Mahmoodi, Associate Professor, King's College London, United Kingdom	"Wireless Network Virtualization, Business Opportunities and Economic Aspects"
	13:00-13:30	Verdun	WS-01	KW10	Masoud Ardakani, Professor, University of Alberta, Canada	"Efficient Coding for Cloud Storage"

Tuesday, October 10, 8:30 – 9:20, Lachine

KW-01 IoT: Multiple Facets of ITS Impact on The Economy and our Society

Amit Mukhopadhyay, Group Leader – Future Wireless Networks Modeling, Bell Labs Consulting, Murray Hill, USA

Since the early days of civilization, mankind has been relentlessly pursuing automation of routine tasks so that more time is available for satisfying higher order human needs of self-fulfillment. This fundamental characteristic of humanity has enabled the level of advancements in our society that has not been observed in any other form of life. In this talk, we start with precursors of automation that have significantly transformed our civilization. We quickly proceed to early forms of machine communication (i.e., M2M) that laid the foundation of today's IoT era. Then we identify key industry sectors that

are likely to be impacted most with advancements in IoT. We do a deeper dive on three specific sectors – healthcare, automotive and utilities where we provide examples of use cases and business models. In the process, we delve into the roles played by different stakeholders in the value chain right across the industries and examine their share of the total value captured. We conclude with a discussion on the broader impact of IoT on the society – improving quality of life for everyone and catering for self-actualization that paves the way for even greater human achievements in the future.

Tuesday, October 10, 13:00 – 14:00, Lachine

KW-02 5G For Smart City and Connected Industry

Ali Khayrallah, Engineering Director, Ericsson Research, Santa Clara, USA

The technology development and standardization of 5G radio access have been rapidly progressing. In addition to enhancing mobile broadband (MBB) services, 5G aims to enable critical machine type communications (cMTC) and support Internet of Things (IoT) using the same network. This ambition poses stringent design requirements and performance objectives in many different dimensions. For example, in addition to significant improvements in peak data rates and network capacity compared to existing cellular technologies, 5G performance objectives further include ultralow latency and ultra-reliability for cMTC, and superior device energy efficiency, low device cost, ubiquitous coverage reaching devices deep indoors, and ultra-high device connection density for IoT. The three pillars of 5G technologies, enhanced MBB, cMTC, and IoT, extend 5G services to many new use cases. In this talk, we first describe the principles adopted in 5G to achieve its performance objectives. We then give examples of how 5G enables smart city and connected industry. Smart city use cases promise many social and economic benefits including sustainability, while connected industry will significantly improve efficiency and productivity as well as safety and security.

Tuesday, October 10, 13:00 – 14:00, Verdun

KW-03 Full-Duplex MIMO - Algorithms and POC Performance

Yang-Seok Choi, Principal Engineer, Wireless Architect Leader, Intel, USA

In this talk, we present enabling technologies for full-duplex (FD) MIMO. For self-interference cancellation, we have introduced adaptive echo cancellation concept which is based on adaptive filter theory. First, open loop technique is compared to closed loop technique. Closed loop technique such as adaptive echo cancellation continuously updates the system parameters even without requiring special training signal and synchronizations such as OFDM boundary, resulting fast and continuous tracking even during random data transmission. Secondly, even in the presence of stronger desired received signal than self-interference, it provides stable tracking and continuous self-interference cancellation. Thirdly, in MIMO, the SIC complexity increases exponentially. We propose simpler architecture for RF cancellation which requires only one extra downconverter regardless of the number of taps without performance loss. For digital cancellation, bilinear architecture is proposed. RF components can be modeled by a linear combination of kernels. In non-bilinear, an adaptive filter is applied at each kernel. Hence, parallel adaptive filters are required. However, in bilinear architecture, two adaptations are cascaded: one for non-linear RF component modeling and the other for echo channel. Although this architecture significantly reduces the complexity, it has stability issues and creates too large dynamics of intermediate variables which prevent from efficient HW implementation. We have solved these shortcomings and will show demo videos of 2x2 MIMO FD system exhibiting that residual self-interference is below noise.

Tuesday, October 10, 14:00 – 15:00, Verdun

KW-04 Secure Wireless Communication with Full-Duplex Radio

Yingbo Hua, Professor, University of California Riverside, USA

Billions of people around the world are interconnected via wireless communication devices for our daily lives and business transactions. Privacy and security have become a top concern as wireless networks are prone to eavesdroppers due to shared physical medium. The physical layer security on top of cryptography is essential to mitigate this concern. The technology of full-duplex radio which is able to transmit and receive at the same time and same frequency is uniquely equipped to ensure a high level of information security. A full-duplex radio is able to jam (although briefly as necessary) all potential eavesdroppers as it receives a secret key from another radio. In this talk, I will present some of the latest developments in understanding the limits and potentials of full-duplex radio in secure wireless communications. In particular, I will highlight cases of known versus unknown channel state information, static versus fading channels, and colluded versus uncolluded eavesdroppers.

Wednesday, October 11, 8:30 – 9:00, Lasalle

KW-05 Learning to Decode

Kai Niu, Professor, BUPT, China

Recently machine learning becomes an active direction in the area of artificial intelligence. Essentially, the general decoding problem can also be viewed as a form of pattern recognition. In this speech, we discuss the some typical decoding algorithms under the frame work of artificial neural networks (ANN). We retrospect the applications of ANN in Viterbi decoding for the convolutional codes and belief propagation (BP) decoding for the LDPC codes. Specifically, we also analyze ANN decoding for the polar codes. The advantages and disadvantages of ANN decoding are summarized.

Wednesday, October 11, 13:00 – 13:45, Lachine

KW-06 Massive MIMO for the New Radio

Frederick W. Vook, Distinguished Member of the Technical Staff, Nokia Bell Labs, USA

This presentation will provide an overview of Massive MIMO as it is being defined in the 3GPP New Radio standardization effort. The unique aspects of 3GPP NR-MIMO will be discussed, and recent system level simulations will be presented comparing the performance characteristics of NR-MIMO with the MIMO techniques in LTE for sub-6GHz systems. NR-MIMO performance characteristics in the mmWave bands will also be discussed.

Wednesday, October 11, 13:40 – 14:30, Lasalle

KW-07 Channel Characteristics for Cooperative ITS and Positioning

Fredrik Tufvesson, Professor, Lund University, Sweden

In this talk, we discuss channel characteristics of wireless vehicular channel and how those affect the possibilities to perform radio based positioning based on already available wireless signals. We review vehicular channel properties, and look at how cellular 5G trends will affect the possibility of performing radio based positioning. We discuss multilink behaviour and the influence of shadowing from other vehicles. We also consider detailed scatterer behaviour and discuss the possibility for multipath assisted positioning. Finally, we wrap up by summarizing different channel modelling approaches for the vehicular channel and their suitability with respect to positioning.

Wednesday, October 11, 15:00 – 16:00, Lasalle

KW-08 Observations on V2X Channel Modeling Requirements and Standards

David Steer, Staff Engineer, Huawei Canada Research Centre, Canada

One of the keys to successful radio communications is a good understanding of the radio channel characteristics. The channel behavior and communications performance is affected by the wavelength, the environment and the motion of the sender and the receiver. In the V2X environment, in which both the transmitter and receiver are at low levels in the clutter, blockage is a particular concern for short wavelengths. A number of channel models have recently been developed for 5G communications services based on general measurements. Most of these measurement campaigns have been made to extract parameters for the average channel statistical behavior in which one end of the link is above the clutter. Here we will discuss their possible application and shortcomings for the difficult V2X environment and the need for reliable communication.

Thursday, October 12, 8:30 – 9:20, Lasalle

KW-09 Wireless Network Virtualization, Business Opportunities, and Economic Aspects

Toktam Mahmoodi, Associate Professor, King's College London, United Kingdom

Virtualization in wireless networks has been mainly driven by the cost factor, however, it has proven to bring new insight in the business model of mobile and wireless networks. Therefore, economics of network virtualisation (NV) can be seen from two different angles including the way NV impacts cost and the way NV impact business relations. The first part of this talk will focus on how network virtualisation impacts OPEX and CAPEX, together with some detailed examples of the IoT and industrial networking. On the other hand, virtualisation enables the mobile wireless ecosystem to evolve from being an environment of bilateral relationship between operators and customers, to a plethora of industries providing services at different positions of the value chain. The second part of this talk, therefore, is focused on how the new business relations are shaped in the virtualized networking environment.

Thursday, October 12, 13:00 – 13:30, Verdun

KW-10 Efficient Coding for Cloud Storage

Masoud Ardakani, Professor, University of Alberta, Canada

Distributed storage systems (DSSs) provide anytime anywhere access to one's data. In order to provide reliability and availability, triple replication method (in which three copies of each block of data is stored) has been traditionally used in DSSs. Considering the high storage overhead of replication methods, new reliable storage methods such as locally repairable codes (LRCs) have recently attracted the attention of both theoreticians and practitioners. A linear block code with dimension k , length n , and minimum distance d is called an LRC with locality r if it can retrieve any coded symbol by at most r other coded symbols. LRCs have been recently used in Facebook HDFS and Windows Azure Storage. In this talk we discuss three results on LRCs. All these results are built around a novel graphical approach to LRC design. First, we discuss the problem of designing binary LRCs (BLRCs). BLRCs are of great importance as they can significantly decrease

coding complexity by eliminating costly multiplication calculations. Second, we study the average locality of LRCs. This is in contrast with existing results which mainly study the maximum locality. Reducing the average locality of an LRC directly decreases the costly

5G SUMMIT KEYNOTE SPEECHES

Monday, October 9, 9:30, Verdun

KS-01 Accelerating the Adoption of 5G by Balancing the Technical Jargon with Customer-Centric Vocabulary

Yesser Nafei, Senior Vice President – LG Electronics, USA

Fifth-generation wireless technology promises to open-up a new horizon of applications and use cases well beyond the conventional mobile and personal communications. For consumers, mobile communication is associated with bandwidth, transmission speed and increased data consumption and applications' usage. Yet for 5G, the value proposition aims to target new industries, secure diverse users and enable the digitalization of our humanity, society and economy. The promise of 5G is to connect the building blocks of our existence including healthcare, energy, transportation, education, manufacturing and even entertainment. The true issue facing 5G is not the technical challenge but rather the wide gap between its lingo and the consumers it wishes to serve. Technologists are increasingly speaking of Massive multiple-input, multiple-output (M-MIMO), beamforming, millimeter-waves, device-to-device (D2D) communications, Machine-to-Machine (M2M), small cell deployment, latency, IoT, software defined networks, network function virtualization, cloud RAN and mobile edge computing. Consumers on the other hand are concerned with the health risks of antennas, the architecture eye-sore of those antennas on top of light poles and buildings, the security nightmare of these billions of connected devices, the data protection of their medical records and more important the dwindling of their privacy in the new age of Robocalls. This presentation will focus on further highlighting this gap challenge and explore techniques, tools and research opportunities to address them to secure the smooth deployment and adoption of 5G.

Monday, October 9, 11:00, Verdun

KS-02 Challenges of Deploying 5G

Muquid Ali, VP of Operation, AWTG Limited, United Kingdom

There's a lot of expectation around 5G and the promise of what it can deliver. To cater for the diverse requirements and high expectations, 5G will require a paradigm shift in our understanding of service conception, capability and delivery. Vendors, operators and standardisation bodies across the world are all working towards developing the necessary technologies and standards that will be needed to deliver the next generation of networks beyond LTE. AWTG has been working with one of the pre-eminent 5G research organisations in the world at the University of Surrey in the UK to understand what the challenges will be to deploying the next generation of 5G networks. Additionally, we are working with government institutions, local enterprise partnerships and industry partners in an advisory capacity looking to deliver 5G trials and testbeds. Based on our experiences, we hope to share some of our key findings and thoughts on what we perceive to be the gap is between the existing LTE deployments and what would be needed to deliver the key 5G use cases such as Connected Autonomous Vehicles, Massive Machine to Machine Connectivity and Enhanced Mobile Broadband. Critically we have developed a business model to understand the financial commitment, investment hurdles and bottlenecks that operators would face as they look to upgrade their existing capability and migrate towards a 5G architecture.

Monday, October 9, 11:15, Verdun

KS-03 5G the "One Size Fits it All" Technology for the Near Future?

Bosco Eduardo Fernandes, Senior Strategic Advisor, COMCON, Germany

The sky-high expectations of 5G to be the one size Technology fits all services across industry verticals, public and private networks is complicated and certainly will not achieve this with a wide range of features and capabilities. There are many opportunities, but also challenges and questions surrounding 5G development/deployment, e.g., from infrastructure and spectrum to devices and use cases. Also, crucial is to be able to identify the relevant issues across industry verticals as well as Challenges and barriers to upgrading to 5G. While 5G is still evolving it is anticipated to have a preliminary 5G standard specifications in 2018, standards implementation and deployment is expected to reach into 2022 and beyond. Hence, 5G will have to co-exist with 4G for sometime. The hype around 5G is already building — similar to what was seen for 3G and 4G. This talk will point out some of these issues from an Industry perspective and the possible solutions).

repair bandwidth, disk I/O, and overhead associated with accessing nodes during a repair process. Finally, we briefly discuss the problem of update complexity in DSSs.

Monday, October 9, 11:30, Verdun

KS-04 Challenges and Innovations in Sustainable Spectrum Management for 5G

Li Li, Senior Research Scientist, Communications Research Centre, Canada

5G wireless networks are set to enable a new paradigm of our future fully-connected society, where autonomous systems, the Internet of Things (IoT), and both virtual and augmented realities will permeate and transform our lives and the economy. This ever-smart environment will be fuelled by use of the radio spectrum. To support the 5G spectrum requirement and demand, the Communications Research Centre (CRC), the federal research lab under the Spectrum and Telecommunications Sector (STS) in the government of Canada, is investigating what is possible and what works for future spectrum management. In this talk, research challenges and possible solutions will be discussed. Key discussion areas will include: cloud-based spectrum monitoring and characterization; machine-learning-enabled spectrum management decision-making; and preparations to facilitate deployment in higher frequency bands. CRC's latest approaches, testbed system prototypes, and experimental results will be described.

Monday, October 9, 11:45, Verdun

KS-05 Putting the Citizens at the Centre of the Network: Cell-Free Architectures

Stefano Buzzi, Associate Professor, University of Cassino and Lazio Meridionale, Italy

5G systems will bring an unprecedented advance and revolution in the way we use cellular networks. Wireless networks will be finally capable of providing residential broadband access with speeds similar to those of ADSL technology, will enable the advent of the tactile Internet, and will serve mobile users with extremely large data-rates. For the first time, citizens will be placed at the center of the network, and mobile-edge-computing will expand the capabilities of their devices. This talk provides an overview of user-centric cell-free architectures, from the CoMP technology up to recent advances in the field of cell-free massive MIMO systems.

Monday, October 9, 14:00, Verdun

KS-06 Shaving the Milliseconds of Communication and Networking Protocols

Toktam Mahmoodi, Associate Professor, King's College London, United Kingdom

Among the major transitions in 5G, is the enablement of mega scale utilities such as extremely higher data rate, significantly lower latency, and close-to-perfect coverage and reliability. The most challenging of these utilities is achieving ultra-low latency together with extreme reliability. While there are various developments on the wireless air interface, getting to milliseconds latencies throughout global connectivity is only possible if end-to-end communication protocols are leaned and extra delays are carved out. This talk overview number of techniques for leaning the communication and networking protocols and shaving the extra milliseconds, with examples of ultra-low latency use cases that are enabled through these techniques.

Monday, October 9, 14:15, Verdun

KS-07 Leveraging the Service Capability Exposure Function (SCEF) in NB-IoT Device Deployments

Michael Starsinic, Principle Engineer, InterDigital, USA

The SCEF (Service Capability Exposure Function) is a core network node that exposes network services to IoT Servers via a set of APIs. The SCEF APIs provide IoT Servers with access to a set of services that can be used to simplify IoT Device applications, extended battery life, and avoid network congestion. IoT Servers will need to properly leverage these API's if we are going to achieve battery lifetimes of up to 10 years in 5G. In his presentation, Michael will give an overview of exposed services, what they are and how they can be used to create successful IoT deployments.

Monday, October 9, 14:30, Verdun

KS-08 NFV/SDN: Technology Enablers for 5G - The Twain Shall Meet!

Faqir Zarrar Yousaf, Senior Researcher, INEC Laboratories Europe, Germany

Communication networks' architecture and technologies are undergoing through their next evolutionary phase towards 5G. This evolutionary phase is markedly different from the previous phases in that the complete concept of networking is undergoing a paradigm shift. Networks are now moving beyond as mere bit-pipe providers towards a highly agile and programmable entity that can be tailored to the varying demands of the vertical industry while ensuring conformance to stringent performance requirements and expectations. New technologies and architectures are being developed that will provide the customers their own isolated network "slices" over the same infrastructure thus creating new use cases and business models. In this context, NFV/SDN technologies are widely being considered as one of the key technology enablers to realize this new concept of communication networks to address the network and traffic management challenges posed by 5G. However, as the two technological platforms are being developed there is now a greater need to bring the two together in a complementary manner to enable a truly agile, programmable and performing 5G network infrastructures. The aim of this talk is thus to inform the audience of the technological progress made in the NFV and SDN domains, highlight the different integration/deployment options, challenges and gaps in making the twain meet.

Monday, October 9, 14:45, Verdun

KS-09 Open 5G Platform

Yang Yang, Professor, SIMIT, and Director, WICO, Chinese Academy of Sciences, China

Facebook has recently announced its OpenCellular platform for promoting open-source wireless access technology developments and broader applications. In this talk, we will give an introduction of an open 5G platform, which applies SDN and NFV techniques to realize the key functions of a telecom operator according to the 3GPP standard on general CPU/GPU computing platform. It is very adaptive and flexible for supporting a variety of internet of things (IoT) applications in vertical industries. New technical challenges and potential applications of this open platform in delay-sensitive control areas will be fully discussed.

Monday, October 9, 16:00, Verdun

KS-10 5G Security in Risks and Vulnerabilities

Stan Wong, 5G Testbed Manager, Digital Catapult, United Kingdom

Virtualization, containerization and softwarization technologies enable telecommunication systems to realize multi-tenancy, multi-network slicing and multi-level services. However, the use of these technologies to such ends requires a redesign of the telecommunications network architecture that goes beyond the current long term evolution-advanced (LTE-A). This talk gives the view of fifth-generation (5G) telecommunications systems and architecture risk and vulnerability, and how to conceive to handle multi-tenancy, multi-network slicing and multi-level services securely. On one hand, 5G telecommunication systems require to deliver the network flexibility, elasticity and traffic fluctuation in the network design. On the other hand, 5G convey two independent standard systems into one unify system using cryptograph and tokenisation technique to secure the subscribers, tenants, physical network elements and virtual network entities. A currently overview of

5G security is given in this talk.

Monday, October 9, 16:15, Verdun

KS-11 The Challenge of Broadcast Support in 5G Systems

Belkacem Mouhouche, Principal Standards Engineer, Samsung Research, United Kingdom

Audio-visual media services generate very large volumes of data traffic on networks, which is unevenly distributed over time and geographical areas. At the same time, Quality of Experience (QoE) is strongly dependent on sustained minimum data rates and low latencies to all regardless of the total number of concurrent users. This is particularly challenging for very popular live content (e.g. sports) or unpredictable events (e.g. breaking news) that tend to cause large traffic spikes. The increasing bit-rate demands of 4k UHD TV and, in the future 8k UHD TV, and the emerging new interactive services (e.g. augmented reality, virtual reality and 360° visual media) will further increase the demand on network capacity and performance. None of the existing networks, whether fixed, mobile or broadcast, has the capability to support this type of future demand on their own due to limitations associated with capacity, delay and cost of deployment. Furthermore, the fractured landscape of protocols and APIs across them severely limits their ability to cooperate in addressing this demand. Point to Multipoint technologies will be addressed once the standardization of broadband and mission critical is finalized. In Order to prepare the point to multipoint standardization, a 5G-PPP project was launched recently, the 5G-Xcast, that will develop a solution that targets the aforementioned limitations and therefore addresses future demand, based on the key capabilities of 5G that by far exceed those of the legacy systems.

Monday, October 9, 16:30, Verdun

KS-12 The Future X Network, A Bell Labs Perspective

Doru Calin, Director & Fellow, Nokia Bell Labs, USA

The talk will provide perspectives on the challenges and opportunities of a new era in networking, which will be defined by the digitalization and connection of everyone and everything with the goal of automating much of life, effectively creating time, by maximizing the efficiency of everything we do. These perspectives are articulated in Nokia Bell Labs's Future X network vision, as we anticipate that the formation of new networks is a driving force for a new technological revolution that has the potential to define a new phase of human existence.

Monday, October 9, 16:45, Verdun

KS-13 Is There any Room or Need for Beyond 5G: 6G Requirements

Klaus David, Full University Professor, Kassel University, Germany

To address the question in the title, i.e. "Is there any room or need for Beyond 5G: 6G first vision and requirements" this paper has two contributions: First, we discuss all the different standards, starting from the first analog wireless cellular standards, via 2nd generation GSM, passing 3G up to 5G. Based on the key achievements of each generation, its factors of success but also its potential deficiencies, then secondly, a first vision for 6G and its requirements is presented.

PANELS

Date	Room	Time		
		09:00-10:30	13:30-15:00	16:30-18:00
Tuesday 10 October	Montréal Ballroom	PA-01 IoT Developments in Connectivity for Industrial, Infrastructure, and Individual Applications		
Wednesday 11 October	Ville-Marie		PA-03 Women in Science and Technology: Towards a Real Transformation	
	Montréal Ballroom	PA-02 5G Research and System Design	PA-04 Role of Unlicensed Spectrum in Next Generation Wireless Systems	PA-05 Urban Connectivity: Challenges and Opportunity

Tuesday, October 10, 9:00 – 10:30, Montréal Ballroom

PA-1 IoT Developments in Connectivity for Industrial, Infrastructure, and Individual Applications

Organizer/Moderator:

- Adam Drobot, Chairman, OpenTechWorks, Inc.; and Chair, IEEE IoT Activities Board, USA

Panelists:

- Michael Starsinic, Principle Engineer, InterDigital, USA
- Christopher Voss, Electronic Design Engineer, CAE Healthcare, USA
- Yang Yang, Professor, SIMIT, and Director, WICO, Chinese Academy of Sciences, China
- Juan Carlos Zúñiga, Senior Standardization Expert, Sigfox, Canada

The Internet of Things Applications are the ultimate manifestation of value. In IoT the composition of solutions, their development, deployment, and operation varies widely as do the specific implementations for connectivity. This panel brings together business leaders and technologists who are intimately involved with and responsible for IoT Applications. The panelists will share their experiences and views with a focus on connectivity and communications, describing how current and future planned approaches can fulfill their connectivity needs. The panel will also discuss the work that needs to be done to enable IoT to reach its full potential.

Wednesday, October 11, 9:00 – 10:30, Montréal Ballroom

PA-2 5G Research and System Design

Organizer/Moderator:

- Doru Calin, Nokia, USA

Panelists:

- Javan Erfanian, Chief Editor, NGMN 5G Initiative; and Distinguished Member of Technology, Wireless Technology Strategy, Bell Canada
- Ali Khayrallah, Engineering Director, Ericsson Research, Santa Clara, USA
- Harish Viswanathan, Head of Radio Systems Research, Nokia Bell Labs, USA
- Jin Yang, Fellow, Verizon, USA

5G is still in its early definition stage. It is a remarkable time for researchers and system designers from across academia and industry to think of innovative approaches required to deliver the substantial improvements expected in multiple dimensions, encompassing spectral efficiency, achievable data rates, ultra-low latency, high reliability, energy consumption and simultaneous number of connected devices. The expert panelists will address opportunities and challenges faced by the evolution to 5G. The panel will discuss the state of the art of 5G research, as well as practical aspects driven by performance requirements and deployment cost, as related to 5G end to end system design. This will include spectrum, air-interfaces, architectural requirements to support 5G use cases, seamless multi-RAT integration, network transformation, network virtualization, standardization, deployment scenarios, user experience, and applications.

Wednesday, October 11, 13:30 – 15:00, Bonaventure

PA-3 P Women in Science and Technology: Towards a Real Transformation

Organizer/Moderator:

- Wafae Bakkali, Postdoctoral Researcher, Centrale Supélec and Sagemcom, France

Panelists:

- Amira Alloum, Nokia Research Labs, France
- Jennifer Andreoli-Fang, Distinguished technologist, CableLabs, USA
- Ayça Özçelikkale, Associate Senior Lecturer, Uppsala University, Sweden
- Catherine Rosenberg, Professor, University of Waterloo, Canada

N2women is a discipline-specific community for researchers in the communications and networking research fields. The main goal of N2women is to foster connections among the under-represented women in computer networking and related research fields. N2women allows women to connect with other women who share the same research interests, who attend the same conferences, who face the same career hurdles and who experience the same obstacles. This N2women panel will discuss ideas about the participation, advancement and status of women in science and engineering fields. Topics to be discussed include:

- Barriers and obstacles that women face in scientific careers;
- How to encourage and inspire the next generation of female scientists and engineers; and
- Personal perspective and stories based on professional experience of panelists from academic and industrial research environments.

Wednesday October 11, 13:30-15:00, Montréal Ballroom

PA-4 Role of Unlicensed Spectrum in Next Generation Wireless Systems

Organizer/Moderator:

- Arnab Roy, Staff Engineer, InterDigital Communications

Panelists:

- Jennifer Andreoli-Fang, Distinguished Technologist, CableLabs, USA
- Belkacem Mouhouche, Principal Standards Engineer, Samsung Electronics Research, UK
- Tamer Kadous, Sr. Director of Engineering, Qualcomm Research, USA
- Samian Kaur, Principal Engineer, 5G Wireless, Comcast Cable, USA

Successive generations of cellular communications standards have aimed at increasing network throughputs by utilizing a variety of tools including increased spectral efficiency, cell densification and also utilizing more frequency spectrum. With licensed spectrum becoming scarcer and therefore more expensive in recent times, the cellular industry has turned its attention towards unlicensed spectrum for additional capacity. Several 4G LTE-based technology options such as LWA, LWIP, LAA and MulteFire are considered by the industry to address the spiking data needs by tapping into unlicensed spectrum in local area network deployments. Moreover, 3GPP has included a Study Item in its ongoing Release-15 work for the 5G New Radio (NR) operation in unlicensed spectrum (including the standalone mode). With this growing momentum it seems likely that operations in unlicensed spectrum will feature prominently in future cellular systems. However, co-existence with Wi-Fi and conformance with regional regulatory considerations are some issues that need to be adequately addressed for widespread acceptance of these technologies. In this panel we propose to hear the views from experts from vendors, cellular operators, cable operators and industry groups on a variety of related issues such as standalone operation challenges, operator deployment and use plans, Wi-Fi coexistence issues, coexistence in the 60 GHz band, operation in the CBRS band and others.

Wednesday, October 11, 16:30 – 18:00, Montréal Ballroom

PA-5 Urban Connectivity: Challenges and Opportunity

Organizer/Moderator:

- Yves Lohanen, CEO ENGIE SIRADEL North America, Canada

Panelists:

- Saad Ahmad, Staff Engineer, InterDigital
- Ahmed Alsohaily, Member of the 5G Spectrum and Wireless Networks Team, TELUS, Canada
- Angelo Cuffaro, Senior Director and Chief Scientist R&D, XCellAir, Canada
- Benoit Fleury, VP Product Line Management, iBwave, Canada

The future of connectivity will reshape our cities, and it is closer than you think. 5G, the next iteration of wireless broadband, promises to offer mobile ultra-broadband, very low-latency services, and capillary networks that will enable the multi millions of wireless sensors necessary for the rollout of the Internet of Things (IoT) across countries and cities. These networks will play an important role in making smart cities possible and enable the digital urban transformation overall. “Autonomous vehicles will be controlled in the cloud. Smart-city energy grids, transportation networks, and water systems will be controlled in the cloud. Immersive education and entertainment will come from the cloud. Such futures, however, won’t come to pass unless the pathway to the cloud is low-latency, ultra-fast, and secure,” former FCC Chairman Tom Wheeler said in a speech in 2016, encouraging to speeding up 5G deployment across USA in order to keep the U.S. at the forefront of wireless communications leadership. As network technologies evolve at a very high pace in Telecommunication, so do all of the techniques, algorithms and

methodologies that relate to building and deploying networks based on those emerging technologies. Past technologies have led to a lot of research activities being carried on in areas such as frequency allocation optimization, wave propagation modeling (e.g. at millimeter waves) or statistical modeling of network performance (in licensed, light licensed and unlicensed frequency bands), in general covering the fields of predicting and optimizing the performance of the deployed network. 5G complement existing technologies and offers new paradigms in terms of network air interface, topology and balance between the core, backhaul and access network. This panel session will review recent progresses in all those areas to serve an optimal connectivity contributing to the Smart City connectivity. The panelists will provide multiple insights into challenges to come and research areas in which the knowledge of our scientific communities and industrial practice needs to progress based on recent pre-5G and IoT deployments.



Goudreau Gage Dubuc

PROPRIÉTÉ INTELLECTUELLE
INTELLECTUAL PROPERTY

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. With the expertise of our talented team and insight gained through years of rewarding relationships, Goudreau Gage Dubuc is structured for the unique challenges that arise with each new mandate.

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

Goudreau Gage Dubuc
2000 McGill College, #2200
Montreal (QC) H3A 3H3

T.: 514-397-7602
www.ggd.com
info@ggd.com

On met vos idées à l'abri®

A home for your ideas®

TUTORIALS

Sunday, October 8, 9:00 – 10:30 / 10:45– 12:15, WESTMOUNT

TU-01 Leap for IoT: Lean, Elastic, Agile, and Proactive Wireless Networks for Enabling Future IoT

Instructors:

- *Ali Imran, University of Oklahoma, USA*
- *Muhammad A. Imran, University of Surrey, UK*

Future of wireless cellular networks is challenged by a plethora of new applications and services, for which legacy networks e.g., LTE were not originally designed. Internet of Things (IoT) or Machine-to-Machine communications (M2M) represent one such amalgam of emerging services. Some of the important key use cases of IoT include smart metering, industrial automation, video surveillance, environment sensing, wearable sensing and computing, vehicular sensing, intelligent transport systems, participatory sensing and crowdsourcing etc. Historically, cellular systems have been mainly designed and optimized to serve traffic from human-to-human (H2H) communications. IoT poses new challenges that cannot be overlooked mainly due to the contrasting nature and density of H2H and IoT devices and the nature of the offered traffic. Therefore, designing future cellular network vis-a-vis 5G and beyond such that it can meet the requirements of both H2H and IoT simultaneously is a great challenge. The paradigm shift required in cellular system design was recently well summarized in a European commission's official 5G vision, revealed at Mobile World Congress 2015 according to which "5G infrastructure should be flexible and rapidly adapt to a broad range of requirements. It should be designed to be a sustainable and scalable technology". In other words, unlike its predecessors, 5G network needs to be designed to be Lean, Elastic, Agile and Proactive, (i.e., LEAP). The term lean characterises low set up time and signalling and control overheads. The term elastic characterizes flexibility and adaptability to provide resources where and when needed. The term proactive denotes the ability to predict and pre-empt instead of reacting to a situation.

Sunday, October 8, 9:00 – 10:30 / 10:45– 12:15, OUTREMONT

TU-02 Massive MIMO – Spectral, Energy, and Hardware Efficiency

Instructor:

- *Luca Sanguinetti, University of Pisa, Italy*

The next generation wireless networks need to accommodate around 1000x higher data volumes and 50x more devices than current networks. Since the spectral resources are scarce, particularly in bands suitable for wide-area coverage, the main improvements need to come from a more aggressive spatial reuse of the spectrum; that is, many more concurrent transmissions are required per unit area. This can be achieved by the massive MIMO (massive multi-user multiple-input multiple output) technology, where the access points are equipped with hundreds of antennas and can serve tens of users on each time-frequency resource by spatial multiplexing. The large number of antennas provides a great separation of users in the spatial domain, which is a paradigm shift from conventional multi-user technologies that mainly rely on user separation in the time or frequency domains. In recent years, massive MIMO has gone from being a mind-blowing theoretical concept to one of the most promising 5G-enabling technologies. Everybody seems to talk about massive MIMO, but do they all mean the same thing? What is the canonical definition of massive MIMO? What are the main differences from classical multi-user MIMO technology from the nineties? What are the key characteristics of the transmission protocol? How does the channel model impact the spectral and energy efficiency? How can massive MIMO be deployed and what is the impact of hardware impairment? Is pilot contamination a problem in practice? This tutorial provides answers to these questions and other doubts that the attendees might have. We begin by covering the main motivation and properties of massive MIMO in depth. Next, we describe basic communication theoretic results that are useful to quantify the fundamental gains, behaviors, and limits of the technology. The second half of the tutorial provides a survey of the state-of-the-art regarding spectral efficiency, energy efficient network design, and practical deployment considerations.

Sunday, October 8, 9:00 – 10:30 / 10:45– 12:15, FONTAINE C

TU-03 Spectrum Management and Sharing for Future Wireless Networks: Dynamic Radio Spectrum Access as a Service

Instructors:

- *Hamid Aghvami, King's College, London, UK*
- *Keivan Navaie, Lancaster University, UK*

In this tutorial we introduce concepts and methods for providing spectrum-access-as-a-service (SaaS) to coexisting wireless systems utilizing the same radio spectrum each with different connectivity requirements. We then present a multi-objective optimization framework to investigate the fundamental performance bounds in a fully dynamic SaaS system. Various system architectures based on full/partial virtualisation are then investigated and their performances are compared. We then look at the SaaS as a digital ecosystem and an innovation framework where we discuss its horizontal scalability and self-organization behaviour as well as its resiliency, robustness, utility and pricing. SaaS-based techniques are then discussed for providing connectivity to mission critical autonomous objects such as autonomous vehicles and robots. Applications of data science and machine learning in future planning of such systems are also explained. We then present several use-cases followed by conclusions and discussions on the challenges and open problems in service oriented provisioning of radio spectrum.

Sunday, October 8, 9:00 – 10:30 / 10:45– 12:15, FONTAINE D

TU-04 Wireless Communications and Networking with Unmanned Aerial Vehicles

Instructor:

- *Walid Saad, Virginia Tech, USA*

Unmanned aerial vehicles (UAVs) are expected to become an integral component of future smart cities. In fact, UAVs are expected to be widely and massively deployed for a variety of critical applications that include surveillance, package delivery, disaster and recovery, remote sensing, and transportation, among others. More recently, new possibilities for commercial applications and public service for UAVs have begun to emerge, with the potential to dramatically change the way in which we lead our daily lives. For instance, in 2013, Amazon announced a research and development initiative focused on its next-generation Prime Air delivery service. The goal of this service is to deliver packages into customers' hands in 30 minutes or less using small UAVs, each with a payload of several pounds. 2014 has been a pivotal year that has witnessed an unprecedented proliferation of personal drones, such as the Phantom and Inspire from DJI, the Lone Project from Google, AR Drone and Bebop Drone from Parrot, and IRIS Drone from 3D Robotic. Such a widespread deployment of UAVs will require fundamental new tools and techniques to analyze the possibilities of wireless communications using UAVs and among UAVs. In the telecom arena, flying drones are already envisioned by operators to help provide broadband access to under-developed areas or provide hot-spot coverage during sporting events. More generally flying drones are expected to become widespread in the foreseeable future. These flying robots will develop a unique capability of providing a rapidly deployable, highly flexible, wireless relaying architecture that can strongly complement small cell base stations. UAVs can provide "on-demand" densification, help push content closer to the end-user at a reduced cost and be made autonomous to a large extent: Airborne relays can self-optimize positioning based on safety constraints, learning of propagation characteristics (including maximizing line of sight probability) and of ground user traffic demands. Finally, UAVs can act as local storing units making smart decisions about content caching. Thus airborne relays offer a promising solution for ultra-flexible wireless deployment, without the prohibitive costs related to fiber backhaul upgrading. Yet another example is when UAVs can be used as flying base stations that can be used to serve hotspots and highly congested events, or to provide critical communications for areas in which no terrestrial infrastructure exists (e.g., in public safety scenarios or in rural areas). Clearly, UAVs will revolutionize the wireless industry and there is an ever increasing need to understand the potential and challenges of wireless communications using UAVs. To this end, this tutorial will seek to provide a comprehensive introduction to wireless communications using UAVs while delineating the potential opportunities, roadblocks, and challenges facing the widespread deployment of UAVs for communication purposes. First, the tutorial will shed light on the intrinsic properties of the air-to-ground and air-to-air channel models while pinpointing how such channels differ from classical wireless terrestrial channels. Second, we will introduce the fundamental performance metrics and limitations of UAV-based communications. In particular, using tools from communication theory and stochastic geometry, we will provide insights on the quality-of-service that can be provided by UAV-based wireless communications, in the presence of various types of ground and terrestrial networks. Then, we will analyze and study the performance of UAV-to-UAV communications. Subsequently, having laid the fundamental performance metrics, we will introduce the analytical and theoretical tools needed to understand how to optimally deploy and operate UAVs for communication purposes. In particular, we will study several specific UAV deployment and mobility scenarios and we will provide new mathematical techniques, from optimization, game, and probability

theory that can enable one to dynamically deploy and move UAVs for optimizing wireless communications. Moreover, we will study, in detail, the challenges of resource allocation in networks that rely on UAV-based communications. Throughout this tutorial, we will highlight the various performance tradeoffs pertaining to UAV communications ranging from energy efficiency to mobility and coverage. The tutorial concludes by over-viewing future opportunities and challenges in this area.

Sunday, October 8, 9:00 – 10:30 / 10:45– 12:15, FONTAINE E
TU-05 Stochastic Geometry-Based Modeling and Analysis of 5G Cellular Networks: A Tutorial

Instructor:

- *Ekram Hossain, University of Manitoba, Canada*

For more than three decades, stochastic geometry has been used to model large-scale ad hoc wireless networks, and develop tractable models to characterize and better understand the performance of these networks. Recently, stochastic geometry models have been shown to provide tractable and accurate performance bounds for cellular wireless networks including multi-tier and cognitive cellular networks, underlay device-to-device (D2D) communications, energy harvesting-based communication, coordinated multipoint transmission (CoMP) transmissions, full-duplex (FD) communications, etc. These technologies will enable the evolving fifth generation (5G) cellular networks. Stochastic geometry, the theory of point processes in particular, can capture the location-dependent interactions among the coexisting network entities. It provides a rich set of mathematical tools to model and analyze cellular networks with different types of cells (e.g., macro cell, micro cell, pico cell, or femto cell) with different characteristics (i.e., transmission power, cognition capabilities, etc.) in terms of several key performance indicators such as SINR coverage probability, link capacity, and network capacity. For the analysis and design of interference avoidance and management techniques in such multi-tier cellular networks (which are also referred to as small cell networks or HetNets), rigorous yet simple interference models are required. However, interference modeling has always been a challenging problem even in the traditional single-tier cellular networks. For interference characterization, assuming that the deployment of the base stations (BSs) in a cellular network follows a regular grid (e.g., the traditional hexagonal grid model) leads to either intractable results which require massive Monte Carlo simulation or inaccurate results due to unrealistic assumptions (e.g., Wyner model). Moreover, due to the variation of the capacity (both network and link capacities) demands across the service area (e.g., downtowns, residential areas, parks, sub-urban and rural areas), the BSs will not exactly follow a grid-based model. That is, for snapshots of a cellular network at different locations, the positions of the BSs with respect to (w.r.t.) each other will have random patterns. By capturing the spatial randomness of the BSs as well as network entities including network users, stochastic geometry analysis provides general and topology-independent results. When applied to networks modeled as spatial Poisson point processes (PPPs) with Rayleigh fading, simple closed-form expressions can be obtained which help us to better understand the network performance behavior in response to the variations in design parameters. Stochastic geometry-based analysis and optimization of future generation cellular networks is a very fertile area of research and has recently attracted significant interest from the research community. The aim of this tutorial is to provide an extensive overview of the stochastic geometry modeling approach for next-generation cellular networks, and the state-of-the-art research on this topic. After motivating the requirement for spatial modeling for the evolving 5G cellular networks, it will introduce the basics of stochastic geometry modeling tools and the related mathematical preliminaries. Then, it will present a comprehensive survey on the literature related to stochastic geometry models for single-tier as well as multi-tier and cognitive cellular wireless networks, underlay D2D communication, and cognitive and energy harvesting D2D communication. It will also present a taxonomy of the stochastic geometry modeling approaches based on the target network model, the point process used, and the performance evaluation technique. Finally, it will discuss the open research challenges and future research directions.

Sunday, October 8, 9:00 – 10:30 / 10:45– 12:15, FONTAINE F
TU-06 Cross-Layer Approaches for Wireless Sensor Networks Powered by Energy Harvesting

Instructors:

- *Subhrakanti Dey, Uppsala University, Sweden*
- *Ayça Özçelikkale, Chalmers University of Technology, Sweden*

In recent years, energy harvesting (EH) solutions have become an emerging paradigm

for powering up future wireless sensing systems. Instead of completely relying on a fixed battery or power from the grid, nodes with EH capabilities collect energy from the environment, such as solar power or power from radio-frequency signals. Energy harvesting constitutes a key enabling technology for internet of things (IoT) applications, including smart homes and cities. This aspect is particularly important given that over 16 billion devices are expected to be connected in the upcoming by 2022 and hence powering of these devices and providing energy autonomous systems is a central concern. This tutorial focuses on cross-layer approaches that treat the communications, control and estimation aspects together. In contrast to approaches that solely focus on communication aspects, this framework emphasizes the underlying sensing and control problem in wireless sensing applications. This unified framework enables researchers to efficiently bridge the gap between the fundamental signal processing results, such as the sampling theorems in signal processing, and the practical limitations imposed by energy harvesting capabilities. The tutorial will start with an overview of energy harvesting technologies and their applications in sensing. This part will allow the audience to get a high-level grasp of energy harvesting technologies and in particular the possibilities and the practical limitations brought by these technologies in sensor networks. We will then move to the theoretical results regarding to estimation and control in energy harvesting systems. We will cover both the off-line and online optimization approaches, and both single and multi-user systems with centralized and decentralized approaches. We will conclude with a summary and a discussion of open research topics.

Sunday, October 8, 9:00 – 10:30 / 10:45– 12:15, FONTAINE G
TU-07 Traffic-Aware Interference Management for Flexible 5G Radio Access

Instructors:

- *Juha Karjalainen, Nokia Bell-Labs, Finland*
- *Antti Tölli, University of Oulu, Finland*

Fully dynamic or flexible time division duplexing (TDD) is an essential 5G ingredient, e.g., in the 3GPP New Radio (NR) specification. In small cell scenarios, especially, the amount of instantaneous uplink (UL) and downlink (DL) traffic may vary significantly with time and among the adjacent cells. In such cases, Dynamic TDD allows full flexibility for resources to be adapted between the UL and DL at each time instant thus providing vastly improved overall resource utilisation. However, the dynamic variation of resource allocation will change the interference seen by neighbouring cells and users, drastically complicating the overall interference management. In particular, this variation can impact systems that employ coordinated beamforming or cooperative multi-cell transmission, which require sufficiently reliable channel state information (CSI) between the mutually interfering network nodes. The target of the tutorial is to provide a holistic view for the design of interference management in 5G and beyond networks based on dynamic traffic aware TDD, particularly addressing relevant technology components such as beamformer training, CSI acquisition, resource allocation and interference control. The methods discussed will account for variations in user traffic as well as the associated overhead from adapting UL/DL resources. First, an overview of 3GPP NR physical layer aspects is provided. A special focus is given for key technology components enabling dynamic TDD operation in NR. After this, the theoretical performance limits of dynamic TDD systems using scheduling and coordinated beamforming are briefly explored. Subsequently, low complexity, near optimal distributed solutions that account for the users' traffic dynamics are considered. Particular emphasis is put on the iterative Forward-Backward (F-B) training based CSI acquisition and direct beamformer estimation mechanisms using precoded pilots, as well as, methods to compensate for pilot non-orthogonality and the associated errors due to imperfect channel measurements. The feasibility of proposed F-B training schemes in the context of 5G radio access covering impacts to frame structure design, UE operation, etc., will be discussed. Finally, the proposed training schemes are extended to network controlled device-to-device (D2D) and cooperative transmission scenarios. The tutorial concludes with some highlights for future research directions.

Sunday, October 8, 9:00 – 10:30 / 10:45– 12:15, FONTAINE H
TU-08 The Rise of the Converged Edge Cloud

Instructor:

- *Doru Calin, Nokia, USA*

The tutorial focusses on the main principles of the converged edge cloud, as the cornerstone of the next generation network architecture. The term “converged” is attributed to two basic trends (a) some of the traditional Radio Access Network (RAN) functions (e.g., baseband processing functions) are moved to the edge cloud for better

scalability, pooling and resiliency and (b) some of the traditional Core functions are decomposed, virtualized and relocated to the edge cloud, allowing for better, unmatched application support. Hence, the converged edge cloud is designed to support the Mobile Edge Computing, Cloud RAN and virtualized Core functions. The tutorial will describe the architectural concepts of the converged edge cloud and will address its key attributes, which include:

- Doru Calin, Nokia, USA Providing the compute and storage infrastructure (edge data centers) serving as flexible application platform at the edge of the network.
- Enabling low-latency applications and massive capacity through localized delivery (e.g., localized services, caching, location awareness).
- Supporting special use cases of ultra-low latency and high reliability for vertical markets.
- Exposing network information to applications to improve user experience and overall network efficiency.
- Enabling support for smart connectivity through algorithms and network intelligence in cloud-based multi-connectivity environments.

Sunday, October 8, 14:00 – 15:30 / 15:45– 17:15, WESTMOUNT TU-09 Machine Learning on Graphs for Wireless Communications

Instructors:

- Laura Cottatellucci, Eurecom, France
- Arun Kadavankandy, INRIA, France

Machine learning algorithms such as clustering and classification on graphs are highly versatile tools applicable to many disciplines. Their application to wireless communications, in particular Wireless Sensor networks is growing. In this tutorial we present important mathematical tools and algorithmic principles for performing learning on data modeled as graphs with a special focus on applications to wireless communications. We discuss basic graph concepts, graph community models, spectral graph theoretic tools, among others.

Sunday, October 8, 14:00 – 15:30 / 15:45– 17:15, OUTREMONT TU-10 Polar Coding: A New Paradigm in Channel Coding

Instructors:

- Jean-Claude Belfiore, Huawei Technologies, France
- Valerio Bioglio, Huawei Technologies, France
- Ingmar Land, Huawei Technologies, France

After turbo coding and LDPC coding, polar coding has emerged as a new coding method in theory and practice, with completely different principles for the design of code, encoder and decoder. With their invention by Arikan in 2008, polar codes have been accepted as a breakthrough in channel coding and have since spawn great academic interest. In late 2016 they were accepted for the eMBB control channel within the 5G standardisation, and so have also manifested their role as practically relevant codes. This tutorial will provide the theoretic principles and practical design approaches for polar codes, and will give an insight into the 5G polar coding standardisation process.

Sunday, October 8, 14:00 – 15:30 / 15:45– 17:15, FONTAINE C TU-11 Low-Power Wireless Communication Technologies for Connecting Embedded Sensors in the IoT: A Journey from Fundamentals to Hands-On

Instructors:

- Gilles Callebaut, KU Leuven, Belgium
- Liesbet Van der Perre, KU Leuven, Belgium

Embedded sensors are enabling a wide range of emerging smart services in domains ranging from healthcare to smart homes and cities. They are waiting to be connected to the internet and rapidly becoming crucial components of a valuable Internet of Things (IoT). The variety of wireless sensor system applications demands for appropriate wireless connectivity. Several new technologies and standards are popping up, fit for short or large range, and various data rate requirements. Dedicated networks are being deployed for Machine Type Communication. This tutorial will bring a theoretical and practical initiation to wireless technologies tailored for connecting embedded sensors. It will explain fundamental concepts of wireless propagation, highlighting the challenges and opportunities to realize low power connections. Several actual technologies and standards for different categories of connections will be introduced. A few illustrative use cases will be presented. A hands-on session will allow the participants to experiment with EFM32 Happy Gecko developer boards, cooperating in small teams. In a final session a glance on future trends will be given. The tutorial will be concluded with an overview of interesting relevant resources and a discussion with the participants on the expectations

for follow up beyond the tutorial.

Sunday, October 8, 14:00 – 15:30 / 15:45– 17:15, FONTAINE D TU-12 Ultra Dense Networks: Principles and Technologies

Instructors:

- Ming Ding, CSIRO, Australia
- David Lopez-Perez, Nokia Bell Labs, Ireland
- Haijun Zhang, University of Science and Technology Beijing, China

Nowadays, the mobile network no longer just connects people but is evolving into billions of devices, such as sensors, controllers, machines, autonomous vehicles, drones, people and things with each other and then achieves information and intelligence. From a planning and optimization perspective on the mobile network, this means that we also need a lot more flexibility to address these future needs. Next-generation (5G) wireless systems are characterized by three key features: heterogeneity, in terms of technology and services, dynamics, in terms of rapidly varying environments and uncertainty, and size, in terms of number of users, nodes, and services. The need for smart, secure, and autonomic network design has become a central research issue in a variety of applications and scenarios. Ultra dense networks (UDN) have attracted intense interest from both academia and industry to potentially improve spatial reuse and coverage, thus allowing cellular systems to achieve higher data rates, while retaining the seamless connectivity and mobility of cellular networks. However, considering the severe inter-tier interference and limited cooperative gains resulting from the constrained and non-ideal transmissions between adjacent base stations, a new paradigm for improving both spectral efficiency and energy efficiency through suppressing inter-tier interference and enhancing the cooperative processing capabilities is needed in the practical evolution of UDN. This tutorial will identify and discuss technical challenges and recent results related to the UDN in 5G mobile networks. The tutorial is mainly divided into four parts. In the first part, we will introduce UDN, discuss about the UDNs system architecture, and provide some main technical challenges. In the second part, we will focus on the issue of resource management in UDN and provide different recent research findings that help us to develop engineering insights. In the third part, we will address the signal processing and PHY layer design of UDN and address some key research problems. In the last part, we will summarize by providing a future outlook of UDN.

Sunday, October 8, 14:00 – 15:30 / 15:45– 17:15, FONTAINE E TU-13 Future WiFi

Instructor:

- Evgeny Khorov, IITP RAS, Russia

In spite of its 30-year history, Wi-Fi is continuously evolving being today the most used wireless technology for Internet access. Recently the fifth generation of the Wi-Fi standard – namely, IEEE 802.11-2016 – was published. It includes advanced techniques for multigigabit communications, more flexible QoS provisioning, power management, etc. In the tutorial, we will look into the next generation of Wi-Fi, which should be ready by 2021, focusing on the hottest topics currently being discussed in IEEE 802.11 Working Group. We will start with recently developed 802.11ah aka Wi-Fi HaLow that extends transmission range up to 1 km and makes Wi-Fi suitable for Internet of Things and Industrial Internet applications. Then we consider 802.11ax, which improves user experience in dense Wi-Fi networks and introduces OFDMA to Wi-Fi. We will also discuss mmWave communications with 802.11ay, data rates of which exceed 250 Gbps. Finally, we study how 802.11ba enables extremely low power communications and how Wi-Fi becomes smarter by providing new services, e.g. very accurate positioning, in addition to just cable replacement, for which it has been originally designed. For each topic, we will consider key features, review existing studies, list open issues and possible problem statements of high interest for both academia and industry.

Sunday, October 8, 14:00 – 15:30 / 15:45– 17:15, FONTAINE F TU-14 NOMA for Next Generation Wireless Networks: State of the Art, Research Challenges, and Future Trends

Instructors:

- Zhiguo Ding, Lancaster University, UK
- Robert Schober, Friedrich-Alexander University, Germany

Non-orthogonal multiple access (NOMA) is an essential enabling technology for the fifth generation (5G) wireless networks to meet the heterogeneous demands on low latency, high reliability, massive connectivity, improved fairness, and high throughput. The key idea behind NOMA is to serve multiple users in the same resource block, such as a time slot, subcarrier, or spreading code. The NOMA principle is a general framework, where

several recently proposed 5G multiple access techniques can be viewed as special cases. Recent demonstrations by industry show that the use of NOMA can significantly improve the spectral efficiency of mobile networks. Because of its superior performance, NOMA has been also recently proposed for downlink transmission in 3rd generation partnership project long-term evolution (3GPP-LTE) systems, where the considered technique was termed multiuser superposition transmission (MUST). In addition, NOMA has been included into the next generation digital TV standard, e.g. ATSC (Advanced Television Systems Committee) 3.0, where it was termed Layered Division Multiplexing (LDM). This tutorial is to provide an overview of the latest research results and innovations in NOMA technologies as well as their applications. Future research challenges regarding NOMA in 5G and beyond are also presented.

Sunday, October 8, 14:00 – 15:30 / 15:45– 17:15, FONTAINE G **TU-15 Millimeter-Wave Networking**

Instructors:

- *Carlo Fischione, KTH Royal Institute of Technology, Sweden*
- *Joerg Widmer, IMDEA Networks Institute, Spain*

In wireless networking, currently one of the most pressing and challenging problems is to keep up with demand by scaling wireless capacity. State-of-the-art wireless communication already operates close to Shannon capacity and one of the most promising options to further increase data rates is to increase the communication bandwidth. Very high bandwidth channels are only available in the extremely high frequency part of the radio spectrum, the mm-wave band. The commercial potential of mm-wave networks has initiated several standardization activities within wireless personal area networks (WPANs) and wireless local area networks (WLANs), such as IEEE 802.15.3 Task Group 3c (TG3c), IEEE 802.11ad standardization task group, WirelessHD consortium, and wireless gigabit alliance (WiGig). First IEEE 802.11ad devices are expected to hit the market in 2016, and several large (European and US) research projects are currently investigating the use of mm-wave communication for backhaul, fronthaul, and even access in mobile

networks. Ericsson Research has announced that a mm-waves cellular standard is expected to be released around 2020. Despite these ongoing standardization efforts and projects, much research is still needed. Communication at such high frequencies suffers from high attenuation and signal absorption, often restricting communication to line-of-sight (LOS) scenarios and requiring the use of highly directional antennas. This in turn requires a radical rethinking of wireless network design. For these reasons, the topic is of extreme relevance and timeliness to wireless networking and communication.

Sunday, October 8, 14:00 – 15:30 / 15:45– 17:15, FONTAINE H **TU-16 Evolution and Perspectives of 5G Cellular Localization**

Instructors:

- *José A. del Peral-Rosado, UAB, Spain*
- *Ronald Raulefs, Institute of Communications and Navigation, Germany*

In recent years we have seen an explosion of location based services. These services mostly rely on an accuracy performance that was “envisioned” two decades ago when the FCC demanded from the network operators such a performance to determine the whereabouts of 911 callers. Neither dedicated position systems, such as GPS, nor the cellular systems could deliver the potential performance in indoor or urban canyons, and therefore, led to an evolution of existing networks (GSM – UMTS – LTE) to provide network based localization. Further, in communication networks geo-location information is identified as a useful input that e.g. represents past and current channel state information and conditions (short- and long-term statistics) and network constellations. Current information jointly with mobility information leads to short-term predictions that have an impact on the different communication layers such as PHY, MAC or network management. Challenging applications of today and in the future demand a much more precise accuracy in the cm-range. We will survey the cellular network evolution of localization and outline potential lessons to be learned for future cellular generations, as well as a timely status of cellular localization within the 5G standard.

WORKSHOPS

Thursday, October 12, 08:30 – 18:00, VERDUN

WS-01 Communication for Networked Smart Cities (CORNER)

Organizers and Co-chairs:

- *Symeon Chatzinotas, University of Luxembourg, Luxembourg*
- *Rui Dinis, Universidade Nova de Lisboa (UNL), Portugal*
- *Syed Ali Hassan, National University of Sciences and Technology, Pakistan*
- *Dushantha Nalin K. Jayakody, National Research Tomsk Polytechnic University, Russia (Lead Co-Chair)*

The demands for high data rates and ultra-reliable coverage become demanding issues due to increase number of population in the world by 2020. The huge demand for high quality life makes the administrator and the governments to put carefully planning in cities in a smarter way. As a premier agent for stimulating a quality of life compatible with a resource efficient economy, the smart city phenomenon has recently seized the imagination of the academia and the industry significantly. As the Internet of things (IoT) and Tactile Internet are predictable to be a primary driving force for future cities, advanced communication methods will play a crucial role in assisting real-time data acquisition and utilization from distributed sensors. However, smart cities will also have to function within the limitations of the national economy and available resources. Consequently, the challenges in the realization of smart cities are many and varied. In general, low energy consumption, constrained bandwidth, latency and budgetary limitations are predominating. In order to overcome these hurdles, it is essential that new ideas and theories for optimizing the network in energy, spectral, latency and monetary terms are presented to achieve a robust environment monitoring and sustainable transportation network, among other provisions. This led the researchers to pave the way for future wireless networks under the umbrella of 5G communications as well. This is an amalgamation of a multitude of technologies ranging from device-level algorithms such as low power transmissions to system-level architectures such as software-defined networking (SDN), the challenges posed by each of these techniques are critical. The smart city idea is also known to work at the intersection of various techniques such as device-to-device (D2D) communications, massive multiple-input multiple-output (MIMO), millimeter wave (mmWave) communications, full-duplex transmissions and Internet of Things (IoT) to name a few.

Thursday, October 12, 09:30 – 18:00, LACHINE

WS-02 Cognitive Radio and Innovative Spectrum Sharing Paradigms for Future Networks (CRAFT 2017)

Organizers and Co-chairs:

- *Kareem Baddour, Communications Research Centre, Canada*
- *Fauzi Bader, CentraleSupélec, France*
- *Panagiotis Demestichas, University of Piraeus, Greece*
- *Oliver Holland, King's College London, UK (Lead Co-Chair)*
- *Adrian Kliks, Poznan University of Technology, Poland*
- *Yioli Kritikou, WINGS ICT Solutions, Greece*
- *Markus Mueck, Intel Mobile & Communications Group, Germany*

There has been a vast increase in the range and proliferation of wireless technologies over recent decades, which has led to the crowding of existing spectrum. Among available solutions to address the resulting congestion and shortage of capacity, cognitive radio (CR) and spectrum sharing concepts have been envisioned. Such concepts will be particularly important in the context of 5G communication systems, where despite the introduction of novel mm-wave "pioneer bands", there will be evermore increased pressure – especially on lower-frequency spectrum. This is due to the coverage and reliability requirements of 5G, in tandem with vastly increased capacity and throughput. CR and other spectrum sharing paradigms can address such issues through increasing the net spectrum available to each particular user. CR can also serve other benefits, such as enhancing the management, performance and coexistence of heterogeneous networks with diverse radio access technologies. It is widely expected that new emerging technologies applied in 5G networks will enable pioneering services, making 5G both socially beneficial and economically viable. Advanced solutions must be identified in both technical and regulatory domains to realize CR and spectrum sharing for such 5G and other future networks. Towards such ends, this workshop aims to gather and promote discussion among researchers, engineers, practitioners, and end-user groups, with the goal of inspiring the analysis and development of CR and spectrum sharing solutions for future networks. A key focus of this workshop is on the practical implementation of the above concepts, and "shift-to-market" considerations. Moreover, this workshop

also focuses on issues, advances and challenges in various research domains related to cognition and wider spectrum sharing schemes in future generation communication systems and networks.

Thursday, October 12, 13:30-15:00, ST-MICHEL

WS-03 Coexisting Radio and Optical Wireless Deployments (CROWD 2017)

Organizers and Co-chairs:

- *Moussa Ayyash, Chicago State University, USA*
- *Hany Elgala, University at Albany, USA*
- *Abdallah Khreishah, New Jersey Institute of Technology, USA*
- *Thomas D.C. Little, Boston University, USA*
- *Michael Rahaim, Boston University, USA (Lead Co-Chair)*

The proliferation of wireless devices in the upcoming evolution of 5G will have a profound impact on the communications industry. Wireless traffic will also surge due to the increasing per-device data demand from novel services and applications. These changes to the wireless communications landscape are driving the demand for ultra-dense wireless network deployments. In recent years, this demand has led to a growing interest in optical wireless (OW) networks as a novel solution. Researchers have shown promising data rates for OW communications via Infrared (IR), visible light communication (VLC), and ultraviolet (UV) technologies. These high data rate capabilities coupled with the directionality of the optical medium allow OW small cells to provide very high bandwidth density (b/s/m²). Accordingly, densely distributed OW small cells have the potential to provide additional wireless capacity in the indoor environments where it is needed most. Compared to traditional RF networks; these OW deployments can provide very high aggregate capacity; however, densely distributed OW small cells are challenged to accommodate highly dynamic environments. Specifically, the OW channel is susceptible to blocking and the smaller coverage region of each cell implies that devices with high mobility will change connections frequently. In order to mitigate the impact of these limitations, heterogeneous networks (HetNets) have been proposed where OW networks supplement traditional RF small cell networks – combining the aggregate capacity gains of the former with the coverage and reliability of the later. These Coexisting Radio and Optical Wireless Deployments, or CROWD networks, are of high interest as we look for new ways to accommodate the demand that will be placed on next generation wireless networks.

Thursday, October 12, 08:30-10:30, LASALLE

WS-04 The Economics of Wireless Network Virtualization

Organizers and Co-chairs:

- *Hamed Ahmadi, University College Dublin, Ireland (Lead Co-Chair)*
- *Linda Doyle, Trinity College Dublin, Ireland*
- *Irene Macaluso, Trinity College Dublin, Ireland*

Wireless network virtualization and cloud-based technologies allow flexible dynamic network composition and lower the entry barriers to the market for both emerging wireless resource providers and niche VNOs. As a result, the economic landscape of providing connectivity services is changing, and the existing pricing and procuring mechanisms of wireless services are becoming obsolete. Virtualization will generate a more heterogeneous wireless networks ecosystem with new players both on the supply side of wireless resources – e.g. local infrastructure providers – and on the demand side – e.g. VNOs specialized in Internet of things services. New and dynamic mechanisms for wireless network orchestration are required to address this heterogeneous environment. In addition to technical aspects related to network management and operation, these new mechanisms should take into account the economic aspects of accessing wireless resources that are heterogeneous both in terms of ownership and type. This creates an interdisciplinary research area that needs a vast variety of expertise including knowledge of network architecture, data analysis and machine learning, game and auction theory, mechanism design, two-side pricing and billing, and user behavior analysis. This workshop will focus on the technical and economic challenges of virtualized wireless networks. The goal of this workshop is to engage wireless engineers, data scientists and economists in a joint action and enhance their collaborations in understanding of the network virtualization ecosystem.

Wednesday, October 11, 08:30 – 18:30, VERDUN

WS-05 Personalized Mobile Applications for Smart Cities and Smart Citizens (PMA 2017)

Organizers and Co-chairs:

- *Nik Bessis, Edge Hill University, UK*
- *Keeley Crockett, Manchester Metropolitan University, UK*
- *Mesut Günes, University of Magdeburg, Germany*
- *Princy Johnson, Liverpool John Moores University, UK (Lead Co-Chair)*
- *Sergio Toral Marín, University of Seville, Spain*

The key challenges in the success of mobile applications are the ability to personalize to the customer requirements, and the trustworthiness of the application through security and dynamic update of information. This workshop explores potentials and constraints of personalization of mobile applications and challenges for smart cities and smart citizens. New techniques and methodologies for personalization such as indoor localization, bi-channel communication between service providers and users are within the scope of the workshop. Furthermore, processes for user-centric design such as co-creation, techniques for secure access and dynamic data updates for secure smart cities and smart citizens are of special interest. As a novel and exciting addition, this workshop includes a specialist tutorial session on “Co-creation technique – the user-centric living labs approach” presented by Mr. Grahame Smith, Head of Allied Health at LJMU. The participants for the tutorial session will be selected based on their EOI expressed through a short description. Also our industry partners will run a product “elevator pitch” session (EOI required). Brief descriptions of the intended panel sessions are given below.

- Mobile applications for mission critical services such as disaster recovery: This session will explore novel intelligent mobility models and protocols to provide temporary communication infrastructure in effectively managing the rescue operation.
- Personalized mobile applications in healthcare for smart citizens: Mobile apps in the healthcare sector have increased rapidly, all vying for the customer base that want to take control of their health and independent living. However, the success depends on the application’s ability to sustain user engagement. Co-creation or participatory design as termed by the health and psychology experts is a proven way of motivating the users and sustaining their engagement with the tool. This session will explore techniques and methodologies for co-creation. Lessons learned from challenges and benefits gained from opportunities in healthcare applications will also be explored.
- Personalized mobile applications in transport for smart cities: One of the deciding factors on a city’s status as a smart city is the transport facility. The transport sector has been working hard to enhance the end-to-end journey experience of their customers. In recent years, there have been several calls for funding applications focusing on this theme. In addition, they also explore ways of enhancing the user experience through stations. The challenges for this focus could be personalizing the information provided to the user, the ability to locate the user indoors/underground, facilitating bi-channel communication between service providers and service users. This session will explore new techniques for indoor location, personalization, dynamic data analysis or cloud computing for providing quality of service for smart cities.

Tuesday, October 10, 09:00 – 18:00, VERDUN

WS-06 Full-Duplex Technologies (FDX 2017)

Organizers and Co-chairs:

- *Jaehoon Chung, Advanced Standard R&D Lab, LG Electronics, Korea*
- *Tho Le-Ngoc, McGill University, Canada*
- *Shilpa Talwar, Wireless Communications Research, Intel Labs, USA*
- *Huan Wu, Huawei Technologies, Canada (Lead Co-Chair)*

Full-duplex (FD) has been considered as an advanced radio technology for next generation communication systems. It breaks the barrier of today’s communications by supporting bi-directional communications without time, frequency and spatial duplexers. By transmitting and receiving at the same time, on the same frequency and on the same spatial link, full-duplex has the potential to double the system capacity and reduce the end-to-end latency. The major challenge for a FD capable device (e.g., a FD capable base station or a FD capable user equipment) is how to effectively cancel the self-interference (SI) that consists of the leakage and reflection of its own transmitting signal which can be more than 100 dB stronger than the sensitivity level of a receiver. In the past few years, SI cancellation techniques have attracted considerable attention from both

industry and academia, and have made remarkable progress in design, implementation and prototyping. Multi-stage and cross-domain approaches involving antenna design, analogue and digital signal processing have made FD technology feasible for future communication products. In the meantime, research and investigation of FD-enabled communication networks are on the horizon. The implication and impact of FD-enabled devices on the throughput and scheduling of FD networks have been widely studied. Traditional communication networks have been challenged by the additional interference caused by FD nodes and devices. One issue that is particularly detrimental to FD networks is the additional mutual interference (MI) among FD capable nodes and devices when all or some of them operate in full-duplex mode. It suggests that network-wide SI and MI cancellation and mitigation are needed, and FD-aware and FD-optimum upper layer protocols are keys to capitalizing FD gains in FD networks.

Tuesday, October 10, 08:30 – 18:30, LACHINE

WS-07 The Internet of Things (IoT), the Road Ahead: Applications, Challenges, and Solutions

Organizers and Co-chairs:

- *Hamid Aghvami, King’s College, UK*
- *Amira Alloum, Nokia Bell Labs, France*
- *Piergiuseppe Di Marco, Ericsson Research, Sweden*
- *Sassan Iraj, Aalto University, Finland (Lead Co-Chair)*
- *Andrés Laya, Ericsson Research, Sweden*
- *Rapeepat Ratasuk, Nokia Bell Labs, USA*

For more than a decade, the Internet of Things (IoT) and its enabling services have been increasingly narrowing the gap between the physical world and cyberspace. It has been pursued mostly by making objects smarter and connecting them pervasively through different technologies. We are witnessing that IoT is revolutionizing the way we interact to our environment. There are many concepts along this road which relate to the general vision of IoT, among which we can refer to (but not limited to): smart factories, smart cities, mobile health, smart products, smart spaces, machine-to-machine (M2M) communications, intelligent transportation systems, smart manufacturing, surveillance, telemetry, industry 4.0, E-health and vehicle-to-vehicle (V2V) communications. What those concepts have in common is that they provide a platform that different smart objects and their related data are integrated to create some services. Research activities have been ongoing in both academia and industry to pave the path towards vast deployment of IoT services and meeting their requirements. However, many issues should be addressed to enable seamless connectivity of devices, systems, and services to introduce varieties of applications. These issues include matters related to embedded sensors and smart objects, resource-constrained devices and networks, secure and robust communications for massive deployment of the sensors and devices, ultra-reliable and low-latency communications (URLLC) for the mission critical systems, data collection and analysis, IoT services and IoT techno-economics aspects, IoT platforms, just to name a few. Many standardization bodies (e.g., 3GPP, ETSI TC M2M, 6LowPAN, IETF, IEEE 802.11, IEEE 802.15, Bluetooth SIG etc.) have launched activities to support the spreading of IoT. More notably and most recently, the 3GPP has standardized narrowband-IoT (NB-IoT) to address the requirements of IoT. The purpose is to provide improved indoor coverage, support to massive number of low throughput devices, low delay sensitivity, ultra-low device cost, low device power consumption, and optimized network architecture. Thus, the research in this area is still underway and novel solutions are needed to efficiently serve a huge number of objects and devices that interact autonomously at a global level in heterogeneous networks. The goal of this workshop is to bring experts and various state-of-the-art research activities in both academia and industry together in the forefront of IoT to present and debate trends, advanced technologies, services and applications that will make possible the integration of verticals.

Wednesday, October 11, 08:30 – 15:00, LACHINE

WS-08 Massive MIMO/FD-MIMO in 5G Mobile Communications

Organizers and Co-chairs:

- *Lingjia Liu, University of Kansas, USA (Lead Co-Chair)*
- *Shaohui Sun, China Academy of Telecommunications Technology, China*
- *Yingmin Wang, China Academy of Telecommunications Technology, China*

The fifth (5G) mobile communication systems are attracting significant amount of interest from industry and academia. Compared to legacy 3G/4G systems which were voice and data-oriented, 5G is expected to cover a wide range of use cases including enhanced mobile broadband (eMBB), ultra-reliability low-latency communication (URLLC), and massive machine-type-communication (mMTC). Massive MIMO/FD-MIMO is expected to

be one of the essential technologies in meeting the diverse performance requirements of 5G. For eMBB with 1000x faster data-rate than 4G, massive MIMO with hundreds of antennas is considered a key enabler for overcoming challenging propagation conditions, especially in mmWave band. For mMTC with millions of connected devices, massive MIMO enables extreme high-order MU-MIMO and new multiple-access schemes such as non-orthogonal multiple access (NOMA). For URLLC communications with very low latency and very high reliability (e.g., vehicular communications, automotive control), superior spatial diversity from massive antenna arrays is essential. The performance gain of massive MIMO/FD-MIMO comes at the expense of increased system challenges including reference signal, channel quantization, CSI feedback, power consumption, beam steering and tracking, beam failure detection and recovery, as well as hardware complexity. The goal of this workshop is to bring together leading researchers in both academia and industry to share their views on these challenges, discuss progresses from both theoretical and implementation perspectives, and identify concepts and technologies that facilitate the successful rollout of massive MIMO in future 5G networks.

Tuesday, October 10, 08:55 – 18:00, LASALLE

WS-09 New Radio Technologies (NR)

Organizers and Co-chairs:

- *Mohammed Atiquzzaman, University of Oklahoma, USA*
- *Jong-Hyoun Lee, Sangmyung University, Korea*
- *Shao-Yu Lien, National Formosa University, Taiwan (Lead Co-Chair)*
- *Chih-Cheng Tseng, National Ilan University, Taiwan*

Different from conventional mobile network designs primarily optimizing the transmission efficiency of single service (e.g., voice/video streams), industry and academia have agreed with the manifold wireless features to be supported by the fifth generation networks (5G). In Sep. 2015, International Telecommunication Union, Radio-communication Sector (ITU-R), has identified three categories for these upcoming wireless features, including enhanced mobile broadband, eMBB (for high data rate transmissions in ultra-high resolution voice/video streams, mobile social networks, virtual/sensory reality), ultra-reliable and low latency communications, URLLC (for low latency and reliable data exchange in unmanned driving, intelligent transportation systems, industrial automation), and massive machine-type communications, mMTC (for small size packets and massive amount of terminal in smart grid/city, sensor networks, Internet-of-Things). In the meantime, ITU-R has also identified the radio transmission requirements of 5G (known as International Mobile Telecommunications 2020, IMT-2020), including 20 Gbps peak data rate, 100 Mbps user experienced data rate, 10 Mbps/m² area traffic capacity, 106 devices/km² connection density, 1 ms latency and mobility up to 500 km/h. To this end, 3GPP consequently launched the standardization activity of 5G New Radio in 2016 to frame Release 15 as the Phase-I 5G specifications. To satisfy these unprecedented radio transmission requirements, a number of technologies not involved in LTE-Advanced will be adopted by New Radio, including utilizing spectrum above 6 GHz (up to 100 GHz), beamforming in both the control and user planes, gNBs with multiple remote transmission/ reception points (TRPs), frame structure with agile resource arrangement, non-orthogonal multiple access (NOMA), new waveforms, etc. In Phase-II specifications, new radio sidelink transmissions, mobile backhaul, unlicensed access, ultra-dense network/access, etc., are also projected for support. In addition to these radio access technologies, network function virtualization (NFV), software-defined network (SDN), network slicing, open

stack/architecture are also considerably studied for the next generation core network. The purpose of this workshop is to bring together state-of-the-art innovations, research activities (both in academia and industry), and the corresponding standardization impacts of New Radio, so as to understand the inspirations, requirements, and the promising technical options to boost and enrich activities in the area of New Radio.

Wednesday, October 11, 08:30-10:30, LASALLE

WS-10 Radio Transmission Technologies with Evolution and Self-Learning Algorithms (RTT-ESLA)

Organizers and Co-chairs:

- *Xiaojie Wang, BUPT, China*
- *Yi Wang, Huawei Technologies, China (Lead Co-Chair)*

With the developments and applications of wireless communications, more and more applications require advanced radio transmission technologies (RTT) to reach the goal of high power and spectrum efficiencies as well as flexibility and adaptation to multiple scenarios such as mobile broadband, ultra reliable communications, the internet of things, etc. Recently, intelligent optimization and self-learning algorithms have been widely studied as potential solutions. Among the latter, the very promising evolution algorithms aim to find the optimal operating point of complex non-continuous cost functions using biologically inspired techniques such as genetic algorithms and particle swarm optimization. Self-learning algorithms are lighted up with the success of machine learning in the artificial intelligence field. Given the strong requirements expected from RTT and the fruitful achievements in evolution and self-learning algorithms (ESLA), it is foreseen that applying ESLA to RTT may solve some of the most daunting challenges in wireless communications.

Wednesday, October 11, 13:30 – 18:00, LASALLE

WS-11 V2X Channel Measurements and Modeling (WVCM 2017)

Organizers and Co-chairs:

- *Taimoor Abbas, Volvo Cars, Sweden*
- *Mate Boban, Huawei Technologies Duesseldorf GmbH, Germany (Lead Co-Chair)*
- *Jian Luo, Huawei Technologies Duesseldorf GmbH, Germany*
- *Reiner Thomä, TU Ilmenau, Germany*
- *Fredrik Tufvesson, Lund University, Sweden*

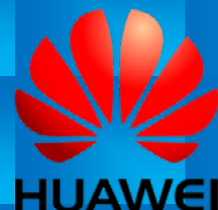
Vehicular communication is characterized by diverse environments, high mobility of both the communicating entities and their surroundings, and comparatively low antenna heights on vehicles. These characteristics are very different from classical cellular cases and make the vehicular propagation and channel modeling particularly challenging. Additionally, the ultimate goal of next generation Vehicle-to-everything (V2X) communication systems is enabling accident-free cooperative automated driving. To achieve this goal, the communication system will need to enable a diverse set of use cases, which can result in channel conditions not fully explored in the past (e.g., blockage effects caused by densely packed platooning vehicles, communication between vehicles and vulnerable road users such as pedestrians and cyclists, etc.). Finally, in recent years, different frequency bands have been proposed for V2X communications (e.g., in centimeter wave bands, millimeter wave bands, and in visible light spectrum). The impact of frequency band and the propagation characteristics of high frequency (millimeter wave) V2X channels, etc. become very important objects of investigation.

Enriching life through communication

Huawei is a leading global ICT solutions provider. Through our dedication to customer-centric innovation and strong partnerships, we have established end-to-end capabilities and strengths across the carrier networks, enterprise, consumer, and cloud computing fields. We are committed to creating maximum value for telecom carriers, enterprises and consumers by providing competitive ICT solutions and services. Our products and solutions have been deployed in over 140 countries, serving more than one third of the world's population.

Huawei's vision is to enrich life through communication. By leveraging our experience and expertise in the ICT sector, we help bridge the digital divide by providing opportunities to enjoy broadband services, regardless of geographic location. Contributing to the sustainable development of society, the economy, and the environment, Huawei creates green solutions that enable customers to reduce power consumption, carbon emissions, and resource costs.

Huawei has over 70,000 product and solution R&D employees, comprising more than 45% of our total workforce worldwide. We have set up 16 R&D centers in countries that include Germany, Sweden, the US, France, Italy, Russia, India, and China. Huawei began investing in 5G in 2009. In December of 2013 Huawei announced to pour \$600m into 5G research over the next five years, ahead of the expected launch of 5G networks in 2020.



SPECIAL SESSIONS

Tuesday, October 10, 16:30 – 18:00, Fundy

SP-01 Big Data-Enabled 5G Systems

Organizers and Co-chairs:

- *Ala Abu Alkheir, University of Ottawa, Canada*
- *Ibrahim Abualhaol, Larus Technologies and Carleton University, Canada*
- *Zied Bouida, Carleton University, Canada*

Fifth Generation (5G) wireless systems will be radically different from previous generations as it will provide ultra-reliable and low latency communications, support massive machine type communications, and introduce enhanced mobile broadband. These three goals stem from the diverse use cases and application domains envisioned for 5G, which include the smart grids, the Internet of Things (IoT), and connected vehicles, just to name a few. To meet these goals, 5G should deliver significantly high peak data rates, spectrum efficiency, area traffic capacity, connection density, network energy efficiency, as well as improved user experience and significantly reduced latency. Making these deliverables will need 5G to leverage big data analytics to proactively allocate network resources. More specifically, the aggregated data by the different 5G devices and systems can be utilized, using elegant big data analytics techniques, in order to provide descriptive, predictive, and prescriptive functionalities. The main challenge of big data analytics for 5G is to come with algorithms to make these functionalities aligned together to maximize the 5G system performance, enable the consideration of other important objectives such as 5G Infrastructure planning, QoS, and operational management which provides insights for future improved design.

Thursday, October 12, 16:30 – 18:00, Jacques-Cartier

SP-02 Software-Defined Edge Computing in Smart Cities

Organizers and Co-chairs:

- *Emad Alsusa, University of Manchester, UK*
- *Mohamed Cheriet, ETS, Canada*
- *Burak Kantarci, University of Ottawa, Canada*
- *Kim Khoa Nguyen, ETS, Canada (Lead Co-Chair)*

Driven by several interdependent trends, like sustainable development, mobility and higher quality of life, smart city applications are enabled by the miniaturization of devices, the Internet of Things (IoT), big data, and artificial intelligent (AI). Edge computing (EC) or similarly fog computing (FC), and software-defined networking (SDN) are two key pillars that boost the scalability and flexibility of smart city infrastructures, thereby enabling unprecedented capabilities of smart city applications and, hence, meeting sustainable development goals.

Wednesday, October 11, 09:00 – 15:00, St-Léonard

SP-03 Advanced Antennas for 5G Wireless Communications Networks

Organizers and Co-chairs:

- *Tayeb A. Denidni, INRS, Canada*
- *Mohamad Mantash, INRS, Canada*

Recently, there has been increasing interest and rapid growth in the use of millimeter-wave (mm-wave) antennas and devices for future mm-wave mobile communications in fifth generation (5G) cellular networks. Using 5G technologies, we will achieve superior performances over today's wireless systems both in terms of bandwidth and data-transfer rates. Despite the benefits, the designers and researchers in the antenna and propagation fields have many challenges in order to make mm-wave practically feasible. At high frequencies, the design of the radiated elements needs to provide characteristics such as: low cost, intelligent and universally applicable and compatible with various mobile terminals and platforms. These challenges need to be addressed adequately. To meet these challenges, antennas for 5G wireless communication networks require to exhibit the following performances: (a) wide pass-band (b) low insertion loss, (c) high gain, (d) beam forming capability and (d) re-configurability to enhance the capabilities of data transport, transmission, and reception between end users and the core network. A promising way to provide these characteristics is to use: mm-wave beamforming antenna arrays, meta-materials based antennas, mm-Wave massive MIMO systems, advanced antennas using electromagnetic periodic structures (FSS, EBG, and AMC). These methodologies provide a basis for developing, designing, analysis, dimensioning, and optimization of transmitting and receiving antennas for 5G wireless networks. We expect to explore these key technologies along with the prospects and challenges of future 5G communication networks. The aim of this special issue is to explore new ideas and

developments to address these challenging problems and to encourage researchers to present original and recent work on advanced antennas for 5G wireless communication systems.

Tuesday, October 10, 09:00 – 15:00, St-Léonard

SP-04 Resource-Efficient, Reliable and Secure Internet of Things in the 5G Era (R2SIOT-5G)

Organizers and Co-chairs:

- *Waleed Ejaz, Ryerson University, Canada*
- *Danda B. Rawat, Howard University, USA*
- *Shree Krishna Sharma, Western University, Canada*

The emerging Internet of Things (IoT) paradigm aims to bring people, data, processes, and things together to fulfill the needs of our everyday lives. The market place for IoT is expected to grow rapidly due to significant increase in the number of smart devices, M2M connections, and smart wearables, and it has a wide range of application areas including eHealthcare, smart grids, smart home, smart cities, connected car and industrial automation. It is expected that the upcoming 5G technologies will be the backbone of IoT and will support IoT systems by expanding the coverage, by reducing the closed-loop latency and by enhancing the data rate. However, there are several challenges to be addressed to provide reliable and secure connections to the massive number of resource-constrained IoT devices. Due to several unique features and diverse requirements of IoT systems such as low latency, low cost, low energy consumption, high failure rate and data transiency, the conventional communication protocols may not be suitable for these systems. In this regard, it is crucial to design resource-efficient, reliable and secure wireless communication technologies by considering various constraints imposed by heterogeneous IoT systems. Moreover, how to handle the massive unstructured/semi-structured data generated by resource-constrained devices through the resource-limited infrastructure is another important issue to be addressed. In this context, the recent trend is to utilize the emerging cloud computing platform to support IoT systems due to its enormous storage and processing capabilities. However, this convergence of IoT and cloud computing requires the need of designing efficient wireless communication technologies, and various aspects such as latency, energy efficiency, computational efficiency, system reliability and security need to be investigated.

Wednesday, October 11, 13:30 – 18:00, St-Pierre

SP-05 5G Wireless Technologies for V2X Communications

Organizers and Co-chairs:

- *Tadilo Endeshaw Bogale, INRS & Western University, Canada*
- *Long Bao Le, INRS, Canada*

The automotive industries, which have been undergoing dramatic technological transformations, are the potential use cases of the 5G networks. More and more vehicles will be connected to the Internet and with each other using wireless technologies. Toward this end, many standardization activities to support these use cases are underway including the fifth-generation automotive association (5GAA) where its objective is to address the society's connected mobility needs and applications, such as autonomous driving, ubiquitous access to services, and integration into the smart city and intelligent transportation system. Wireless technologies to support the connected vehicles must deal with the extremely dynamic propagation environment. Furthermore, as connected vehicles are likely utilized for emergency and mission critical applications, they require extremely low latency. For these reasons, several challenges must be addressed to realize the well-integrated, secured and cost-effective vehicular communication systems. The situation is even be more challenging for V2X systems, which embraces V2V, V2I, VANET etc., as the nodes of these systems require tight collaboration with one another and they can be highly mobile. Future 5G wireless systems, which utilize both microwave and millimeter wave (mmWave), are anticipated to achieve a 1000X capacity gain compared to current wireless radios. And it is expected that 5G wireless technologies will enable cost-effective V2X systems. The goal of this special session is to gather researchers, academia, industry and regulators to present and discuss their research findings highlighting the opportunities, challenges, and potentials of 5G wireless systems for enabling future connected vehicles.

Thursday, October 12, 09:00 – 15:00, St-Léonard

SP-06 Mission-Critical Communications: Advancements, Challenges, and Opportunities

Organizers and Co-chairs:

- *Omneya Issa, Innovation, Science, and Economic Development (ISED), Canada*

(Lead Co-Chair)

- **Ayman Sabbah, Carleton University, Canada**

Public Safety and Emergency Preparedness (PSEP) agencies are responsible for creating safe and stable environments, and for executing Mission-Critical (MC) operations, where life may be at risk, such as responding to disastrous situations that are caused by nature or by human activities or keeping peace in war-zones. The PSEP services include law enforcement, police operations, firefighting, emergency medical response, military activities, border security, and disaster recovery. One of the key elements for successful PSEP operations is to have efficient communication channels and data

exchange between the units dealing with the situations. Telecommunication networks used for PSEP operations are usually referred to as Mission-Critical Networks (MCNs). Despite witnessing big advancements in wireless communication technologies, current MCNs are still using less sophisticated legacy communication systems. This is due to the rigorous and strict requirements for MCNs in terms of security, throughput, reliability and latency. This special session would highlight the requirements of MCNs, discuss the current research efforts in this field and offer an opportunity for synergy and collaboration between academia, industry and government agencies to discuss and develop feasible solutions that are tailored to fit MCNs needs.

TECHNICAL SESSIONS

TRACK 1: FUNDAMENTALS AND PHY

Tuesday, October 10

09:00 - 10:30

TR1/S01: 5G Physical Layer I

Chair: Leila Nasraoui (University of Manouba, Tunisia)

Room: Fontaine C

09:00 *ML Time Delay Estimation for 5G Links with DSSS Multi-Carrier Multipath MIMO Radio Access*

Ahmed Masmoudi (McGill University, Canada); Faouzi Bellili (University of Toronto, Canada); Sofiene Affes (INRS-EMT, Canada); Ali Ghayeb (Texas A&M University at Qatar, Qatar)

09:18 *Unified Stochastic Geometry Analysis of Downlink Cellular Networks*
Imene Trigui (University of Toronto, Canada); Sofiene Affes (INRS-EMT, Canada); Ben Liang (University of Toronto, Canada)

09:36 *FPGA Prototyping of a STAR-Based Time-Delay Estimator for 5G Radio Access*
Haithem Haggui (Institut National de la Recherche Scientifique, Canada); Faouzi Bellili (University of Toronto, Canada); Sofiene Affes (INRS-EMT, Canada)

09:54 *Coverage in Downlink Heterogeneous mmWave Cellular Networks with User-Centric Small Cell Deployment*
Xueyuan Wang, Esma Turgut and M. Cenk Gursoy (Syracuse University, USA)

10:12 *Bit Precision Study of A Non-Orthogonal Iterative Detector with FPGA Modelling Verification*
Tongyang Xu and Izzat Darwazeh (University College London, United Kingdom (Great Britain))

TR1/S02: NOMA

Chair: Salama Said Ikki (Lakehead University, Canada)

Room: Fontaine D

09:00 *Non-orthogonal Multiple Access Based Hybrid Beamforming in 5G mmWave Systems*

Wu Wei (Beijing University of Post and Telecommunication, P.R. China); Danpu Liu (Beijing University of Posts and Telecommunications, P.R. China)

09:18 *Time and Power Allocation for Non-Orthogonal Multiple Access Relaying Networks*
Yue Xiao, Li Hao, Zheng Ma, Zhengquan Zhang and Zequn Fang (Southwest Jiaotong University, P.R. China)

09:36 *Efficient Transmission Schemes for Low-Latency Networks: NOMA vs. Relaying*

Yulin Hu (RWTH Aachen University, Germany); M. Cenk Gursoy (Syracuse University, USA); Anke Schmeink (RWTH Aachen University, Germany)

09:54 *Outage Constraint Based Robust Beamforming Design for Non-Orthogonal Multiple Access in 5G Cellular Networks*

Sayedeh Faezeh Alavi and Kanapathippillai Cumanan (University of York, United Kingdom (Great Britain)); Zhiguo Ding (Lancaster University, United Kingdom (Great Britain)); Alister G. Burr (University of York, United Kingdom (Great Britain))

10:12 *ID Based Bandwidth-Length Interleaver Design for Non-Orthogonal Multiple Access OFDM Systems*

Chanho Yoon (ETRI, Korea)

TR1/S03: Interference I

Chair: Jingwen Bai (Intel Corporation, USA)

Room: Fontaine E

09:00 *Interference Mitigation and Traffic Adaptation in Full-Duplex Small Cell Networks*

Jingwen Bai and Shu-ping Yeh (Intel Corporation, USA); Yang-Seok Choi (Intel, USA)

09:18 *Interference Management by Exploiting Cached Files at Users*

Kaiyang Guo, Chenyang Yang and Tingting Liu (Beihang University, P.R. China)

09:36 *Coexistence Interference Evaluation and Analysis of LTE with 3D-MIMO System*

Kaixi Xia, Yafeng Wang and Didi Zhang (Beijing University of Posts and Telecommunications, P.R. China)

09:54 *Transformed-Channel Feedback for the Two-User MISO Interference Channel*

Ariel Heller and Yair Noam (Bar Ilan University, Israel); Benjamin M. Zaidel (Bar-Ilan University, Israel)

10:12 *On the Ergodic Strong Interference Channel Under Lattice Coding and Decoding*

Ahmed Hindy (University of Texas at Dallas, USA); Aria Nosratinia (University of Texas, Dallas, USA)

TR1/S04: Signal Processing for Wireless I

Chair: Carlos A. Gutiérrez (Universidad Autonoma de San Luis Potosi, Mexico)
Room: Fontaine F

09:00 *Highly Isolated Broadband Five-port Circuit for V-Band High Data-rate Wireless Communications*

Chaouki HANNACHI (Institut National de la Recherche Scientifique (INRS), Canada); Serioja Ovidiu Tatu (INRS-EMT, Canada)

09:18 *Joint Automotive Radar-Communications Waveform Design*

Sayed Hossein Dokhanchi (University of Luxembourg, Luxembourg); Bhavani Shankar Mysore R (Interdisciplinary Centre for Security, Reliability and Trust & University of Luxembourg, Luxembourg); Yogesh Nijure (University of Luxembourg, Luxembourg); Thomas Stifter (IEE, Luxembourg); Saeid Sedighi (University of Luxembourg, Luxembourg); Björn Ottersten (University of Luxembourg, Luxembourg)

09:36 *On the Spectral Moments of Non-WSSUS Mobile-to-Mobile Double-Rayleigh Fading Channels*

José J. Jaime-Rodriguez (UASLP, Mexico); Carlos A. Gutiérrez (Universidad Autonoma de San Luis Potosi, Mexico); Matthias Pätzold and Alireza Borhani (University of Agder, Norway)

09:54 *Evaluation of Vehicular Antenna Concepts Under Delay-Limited Capacity as Performance Measure for Safety-Critical Message Transfer*

Christian Arendt (BMW Group & Technical University of Munich, Germany); Adrian Posselt and Peter Fertl (BMW Group, Germany); Janis Nötzel (Technische Universität Dresden, Germany); Holger Boche (Technical University Munich, Germany)

10:12 *Impact of Soundproof Walls on V2V Communication in Urban Viaduct Scenarios at 5.9 GHz Band*

Changzhen Li and Junyi Yu (Wuhan University of Technology, P.R. China); Kun Yang (Super Radio AS, Norway); Wei Chen, Fang Li and Yishui Shui (Wuhan University of Technology, P.R. China)

TR1/S05: Source/Channel Coding I

Chair: Michel Kulhandjian (University of Ottawa & Carleton University, Canada)
Room: Fundy

09:00 *Sphere Decoder with Dichotomic Search*

Mohamed Achraf Khsiba (Telecom ParisTech, France); Ghaya Rekaya-Ben Othman (TELECOM ParisTech, France)

09:18 *Towards High Performance Short Polar Codes: Concatenated with the Spinal Codes*

Dan Dong (Shenzhen Graduate School, Harbin Institute of Technology, P.R. China); Shaohua Wu (Harbin Institute of Technology, P.R. China); Xiaoming Jiang (Shenzhen Graduate School, Harbin Institute of Technology, P.R. China); Jian Jiao (Harbin Institute of Technology - Shenzhen, P.R. China); Qinyu Zhang (Shenzhen Graduate School, Harbin Institute of Technology, P.R. China)

09:36 *Design of Permutation-Based Sparse Code Multiple Access System*

Michel Kulhandjian (University of Ottawa & Carleton University, Canada); Claude D'Amours (University of Ottawa, Canada)

09:54 *On-Off Necklace Codes for Asynchronous Mutual Discovery*

Olav Tirkkonen (Aalto University, Finland); Zexian Li (Nokia Bell Labs, Finland);

- 10:12 Lu Wei (University of Michigan-Dearborn, USA); Alexey Vinel (Halmstad University, Sweden)
Polar Coded Multi-antenna Multidimensional Constellations in Partially Coherent Channels
 Hossein Khoshnevis, Ian D. Marsland and Halim Yanikomeroglu (Carleton University, Canada)

TR1/S06: Channel Measurement and Modeling I

- Chair: Claude Oestges (Université Catholique de Louvain, Belgium)
 Room: Longueuil
- 09:00 **Experimental Characterization of Geometry-Based Channel Models in Suburban Microcells**
 Claude Oestges (Université Catholique de Louvain, Belgium); Natalia Dementieva (UCLouvain, Belgium); Evgenii Vinogradov (KU Leuven, Belgium)
- 09:18 **Millimeter Wave Channel Measurements in a Railway Depot**
 Berna Bulut, Thomas Barratt, Di Kong, Jue Cao, Alberto Loaiza Freire, Fai Tila, Simon Armour, Mark Beach and Andrew Nix (University of Bristol, United Kingdom (Great Britain))
- 09:36 **Frequency Dependence of Site-Specific Path Loss in Urban Macro Cell Environments Between 2 and 66 GHz Bands**
 Motoharu Sasaki (NTT Access Network Service Systems Laboratories, Japan); Mitsuki Nakamura (NTT Corporation, Japan); Minoru Inomata (NTT DOCOMO, INC. & 5G Laboratory, Japan); Wataru Yamada (Nippon Telegraph and Telephone Cooperation, Japan); Naoki Kita (Nippon Telegraph and Telephone Corp., Japan); Yasushi Takatori (NTT Network Innovation Laboratories, Japan); Koshiro Kitao and Tetsuro Imai (NTT DOCOMO, INC., Japan)
- 09:54 **60 GHz Temporal Dispersion Characteristics with Different Antenna Polarizations in an Underground Mine**
 Shah Ahsanuzzaman Md Tariq (Université de Montréal-École Polytechnique de Montréal & Poly-Grames Research Center, Canada); Charles Despins (ETS, University of Quebec, Canada); Sofiene Affes (INRS-EMT, Canada); Chahe Nerguizian (Ecole Polytechnique, Canada)
- 10:12 **On the Influence of Walking People on the Doppler Spectral Characteristics of Indoor Channels**
 Ahmed Abdelgawwad and Matthias Pätzold (University of Agder, Norway)

Tuesday, October 10

13:30 - 15:00

TR1/S07: Beamforming I

- Chair: Asma Bouhlel (Laboratory of Electronic and Microelectronic, Tunisia)
 Room: Fontaine C
- 13:30 **Multiple-user's MM-Wave Communication by Interleaved Beamforming with Inter-Subarray Coding**
 Zhengyi Li (Fujitsu Laboratories Ltd, Japan); Atsushi Honda, Toshihiro Shimura, Kazuyuki Ozaki, Shohei Ishikawa, Chikara Kojima, Shunsuke Fujio, Kenichi Nishikawa, Hiroshi Ashida and Takenori Ohshima (Fujitsu Laboratories Ltd., Japan); Masahiko Shimizu (Fujitsu Laboratories Ltd, Japan); Yoji Ohashi (Fujitsu, Japan)
- 13:48 **Efficient Energy Beamforming for Multi-Device Microwave Wireless Power Transfer Under Tx/Rx Power Constraints**
 Kentaro Murata, Kohei Onizuka, Toshiya Mitomo, Makoto Higaki, Kentaro Taniguchi, Ryoko Matsuo and Tsuguhide Aoki (Toshiba Corporation, Japan)
- 14:06 **Codebook and Training Sequence Assisted Beamforming Training for MIMO-OFDM Systems**
 Guodong Zhang (InterDigital Communications Corp., USA); Allan Yingming Tsai (Columbia University & InterDigital Comm. Corp., USA); Tianyi Xu (Interdigital Communications LLC, USA)
- 14:24 **Joint Design of Beam Selection and Precoding for mmWave MU-MIMO Systems with Lens Antenna Array**
 Rongbin Guo and Yunlong Cai (Zhejiang University, P.R. China); Qingjiang Shi (Zhejiang Sci-Tech University, P.R. China); Minjian Zhao (Zhejiang University, P.R. China); Benoit Champagne (McGill University, Canada)
- 14:42 **Session Adjournment**

TR1/S08: Channel Estimation I

- Chair: Fredrik Rusek (Lund University, Sweden)
 Room: Fontaine D
- 13:30 **Sequential Channel Estimation in the Presence of Phase Noise in NB-IoT Systems**
 Fredrik Rusek and Sha Hu (Lund University, Sweden)
- 13:48 **Blind Multiple Carrier Frequency Offsets Estimation for OFDM with Distributed Multi-Antenna Receiver**
 Yunqi Feng, Weile Zhang and Yinghao Ge (Xi'an Jiaotong University, P.R. China)
- 14:06 **Channel Quality Prediction in LTE: How Far Can We Look Ahead Under Realistic Assumptions?**
 Mustapha Amara (France Research Center, Huawei Technologies Co., Ltd., France); Afef Feki (France Research Center, Huawei Technologies, France); Stefan Valentin (Huawei Technologies, France)
- 14:24 **Fast and Robust Visual Ego-Motion Estimation Using Stereo Vision for Indoor Hand-Held/Wearable Localization and Tracking Applications**
 Farhang Vedadi and Shahrokh Valaee (University of Toronto, Canada)
- 14:42 **Experimental Comparison of 4 OFDM Channel Estimation Methods for V2V Communications**
 Manuel Milla (University of Poitiers, France); Hervé Boeglen (University of Poitiers XLIM Lab, France); Loic Bernard and Dirk Schmoltzi (ISL, France); Rodolphe Vauzelle (XLIM, France)

TR1/S09: Cognitive Radio

- Chair: Sanjeev Gurugopinath (PES University, India)
 Room: Fontaine E
- 13:30 **A Cognitive MIMO Transceiver for Enhanced 4G and Beyond Link-Level Throughput**
 Imen Mrissa (INRS-EMT, Canada); Faouzi Bellili (University of Toronto, Canada); Sofiene Affes (INRS-EMT, Canada); Alex Stéphenne (Ericsson & INRS-EMT, Canada)
- 13:48 **Maximum Eigenvalue-Based Spectrum Sensing over α - μ Fading Channels**
 Samudhyatha B (RVCE, India); Sanjeev Gurugopinath (PES University, India); Saraswathi K (R V College of Engineering, India)
- 14:06 **Energy Efficiency Optimization for Superior Selective Reporting-based Spectrum Sensing**
 Rajalekshmi Kishore (Biral Institute of Technology (BITS)Pilani K. K Biral Goa Campus, India); Ramesha C K (Birla Institute of Technology(BITS)Pilani, K. K. Birla Goa Campus, India); Sanjeev Gurugopinath (PES University, India); Eshaan Sangodkar (Birla Institute of Technology(BITS)Pilani, K. K. Birla Goa Campus, India)
- 14:24 **Error Performance of Wireless Powered Cognitive Relay Networks with Interference Alignment**
 Sultangali Arzykulov (Nazarbayev University, Kazakhstan); Galymzhan Naurzybayev (Hamad Bin Khalifa University (HBKU), Qatar); Theodoros Tsiftsis (Nazarbayev University & Technological Educational Institute of Central Greece, Kazakhstan); Mohamed M. Abdallah (Hamad Bin Khalifa University (HBKU), Qatar)
- 14:42 **Primary User Detection in Cognitive Radio Using Spectral-Correlation Features and Stacked Denoising Autoencoder**
 Hang Liu, Xu Zhu and Takeo Fujii (The University of Electro-Communications, Japan)

TR1/S10: D2D Communications I

- Chair: Leila Nasraoui (University of Manouba, Tunisia)
 Room: Fontaine F
- 13:30 **Generalized SINR Analysis for Device-to-Device Communications**
 Imene Trigui and Ben Liang (University of Toronto, Canada); Sofiene Affes (INRS-EMT, Canada)
- 13:48 **Energy Efficiency of Relay Aided D2D Communications Underlying Cellular Networks**
 Rui Zhang and Yongzhao Li (Xidian University, P.R. China); Chengxiang Wang (Heriot-Watt University, United Kingdom (Great Britain)); Yuhuan Ruan and Hailin Zhang (Xidian University, P.R. China)

- 14:06 **SRS-Based D2D Neighbor Discovery Scheme for LTE Cellular Networks**
Leila Nasraoui (University of Manouba, Tunisia); Leila Najjar (Sup'Com, Tunisia)
- 14:24 **Sum-Rate Maximization for Energy Harvesting-Aided D2D Communications Underlaid Cellular Networks**
Chi-Han Lee, Ronald Y. Chang and Chun-Tao Lin (Academia Sinica, Taiwan); Shin-Ming Cheng (National Taiwan University of Science and Technology, Taiwan)
- 14:42 **Green Heterogeneous Networks via an Intelligent Power Control Strategy and D2D Communications**
Fereidoun H. Panahi (Keio University, Japan); Farzad H. Panahi (University of Kurdistan, Iran); Ghaith Hattab (University of California, Los Angeles, USA); Tomoaki Ohtsuki (Keio University, Japan); Danijela Cabric (University of California Los Angeles, USA)

TR1/S11: Modulation I

- Chair: Zied Bouida (Carleton University, Canada)
Room: Fundy
- 13:30 **Efficient DCT-MCM Detection for Single and Multi-Antenna Wireless Systems**
Chang He and Pei Xiao (University of Surrey, United Kingdom (Great Britain)); Lei Zhang (University of Glasgow, United Kingdom (Great Britain)); Juquan Mao (University of Surrey, United Kingdom (Great Britain)); Aijun Cao (ZTE Wistron Telecom AB, Sweden); Konstantinos Nikitopoulos (University of Surrey, United Kingdom (Great Britain))
- 13:48 **A DHT-based Multicarrier Modulation System with Pairwise ML Detection**
Juquan Mao (University of Surrey, United Kingdom (Great Britain)); Chin-Liang Wang (National Tsing Hua University, Taiwan); Lei Zhang (University of Glasgow, United Kingdom (Great Britain)); Chang He, Pei Xiao and Konstantinos Nikitopoulos (University of Surrey, United Kingdom (Great Britain))
- 14:06 **Performance Comparison of Constant Envelope DCT- AND FFT-based OFDM Systems with Phase Modulation over Frequency-Nonselective Fading Channels**
Rayan Alsisi (Western University, Canada); Raveendra Kolarramakrishna Rao (University of Western Ontario, Canada)
- 14:24 **Uplink and Downlink Transceiver Design for OFDM with Index Modulation in Multi-user Networks**
Merve Yuzgecciglu and Eduard Jorswieck (TU Dresden, Germany)
- 14:42 **Novel Blind Modulation Classification of Circular and Linearly Modulated Signals Using Cyclic Cumulant**
Rahul Gupta (Indian Institute of Technology, Patna, India); Sudhan Majhi (Indian Institute of Technology, India); Weidong Xiang (University of Michigan, Dearborn, USA)

Tuesday, October 10

16:30 - 18:00

TR1/S12: Cooperative Communications I

- Chair: Oussama Damen (University of Waterloo, Canada)
Room: Fontaine C
- 16:30 **Dual-hop Malaga-M FSO Systems with Pointing Errors**
Nesrine Cherif (INRS, Canada); Imene Trigui (University of Toronto, Canada); Sofiene Affes (INRS-EMT, Canada)
- 16:48 **Outage Probability Analysis of a Two-hop Rayleigh-Lognormal Relay Network**
Ahmed Wagdy Shaban (University of Waterloo, Canada & Wireless Intelligent Networks Center, Nile University, Egypt); Oussama Damen (University of Waterloo, Canada)
- 17:06 **Enhance Cell-Edge Rates by Amplify-Forward Shared Relays in Dense Cellular Networks**
Seyedarvin Ayoughi and Wei Yu (University of Toronto, Canada)
- 17:24 **Compute-and-Forward on Gaussian Interference Relay Channel**
Ammar Jlassi (University of Carthage, SUP'COM, COSIM Research Lab. & Institut Supérieur des Etudes Technologiques en Communications de Tunis,

Tunisia); Larbi Ben Hadj Slama (University of Carthage, SUP'COM, Innov'COM Research Lab, Tunisia); Abdellatif Zaidi (Université Paris-Est, France); Sofiane Cherif (University of Carthage, Higher School of Communication of Tunis (SUP'COM), COSIM Research Lab., Tunisia)

17:42 **A Probabilistic Retransmission Protocol on a Relaying Network**
Faton Maliqi (L2S-CNRS-CentraleSupélec-University of Paris Sud, France); Francesca Bassi (LSS-CNRS-Supélec, France); Pierre Duhamel (Lss Supélec & CNRS, France); Ilir Limani (University of Prishtina, Faculty of Electrical and Computer Engineering, Kosovo)

TR1/S13: Massive MIMO I

- Chair: Mikael Sternad (Uppsala University, Sweden)
Room: Fontaine D
- 16:30 **Low-Complexity MMSE Detector for Massive MIMO Systems Based on Damped Jacobi Method**
Juan Minango (University of Campinas, Brazil); Carlos Daniel Altamirano (Universidad de la Fuerzas Armadas ESPE, Ecuador); Celso Almeida (Unicamp, Brazil)
- 16:48 **Multi-Pair Two Way AF Full-Duplex Massive MIMO Relaying with ZFR/ZFT Processing**
Ekant Sharma (Indian Institute of Technology, Kanpur, India); Rohit Budhiraja (IIT Madras, India); Kasturi Vasudevan (Indian Institute of Technology Kanpur, India)
- 17:06 **Hard-Output Chase Detectors for Large MIMO: BER Performance and Complexity Analysis**
Hadi Sarieddeen, Mohammad Mansour and Ali Chehab (American University of Beirut, Lebanon)
- 17:24 **Key Solutions for a Massive MIMO FDD System**
Wolfgang Zirwas (Nokia Siemens Networks GmbH&CoKG, Germany); Mikael Sternad and Rikke Apelfröjd (Uppsala University, Sweden)
- 17:42 **Spectral Efficiency Maximization of Single Cell Massive Multiuser MIMO Systems via Optimal Power Control with ZF Receiver**
Omid Saatlou, M. Omair Ahmad and M. N. S. Swamy (Concordia University, Canada)

TR1/S14: Security I

- Chair: Elias Bou-Harb (Cyber Threat Intelligence Laboratory, Florida Atlantic University, USA)
Room: Fontaine E
- 16:30 **Game-based Secure Sensing for the Mobile Cognitive Radio Network**
Jihen Bennaceur (National School of Computer Science Tunisia, Tunisia); Sami Souihi (University Paris Est UPEC, France); Hanen Idoudi (National School of Computer Science - University of Manouba, Tunisia); Leila Azouz Saidane (ENSI, University of Manouba, Tunisia); Abdelhamid Mellouk (UPEC, University Paris-Est Creteil Val de Marne, France)
- 16:48 **Physical Layer Security in D2D-enabled Cellular Networks: Artificial Noise Assisted**
Yajun Chen (National Digital Switching System Engineering and Technological R&D Center, P.R. China); Xinsheng Ji (National Digital Switching System Engineering & Technological R&D Center, P.R. China); Jing Yang and Kaizhi Huang (National Digital Switching System Engineering & Technological Research Center, P.R. China); Yi Ming (Zhengzhou Institute of Information Science and Technology, P.R. China)
- 17:06 **Secure Transmission in Power Beacon Assisted Wireless Communication Networks**
Yuzhen Huang (School of Information and Communication, Beijing University of Posts and Telecommunications, P.R. China); Ping Zhang (WTI-BUPT, P.R. China); Jinlong Wang (PLA University of Science and Technology, P.R. China); Qihui Wu (PLA University of Science and Technology, P.R. China)
- 17:24 **Physical Layer Security in Full-Duplex Cellular Networks**
Ayda Babaei and Hamid Aghvami (King's College London, United Kingdom (Great Britain)); Arman Shojaeifard and Kai Kit Wong (University College London, United Kingdom (Great Britain))
- 17:42 **Secret Key Generation in MIMO Wireless Systems Using Precoded Channel Measurements**
Saygin Baksi and Dimitrie C. Popescu (Old Dominion University, USA)

TR1/S15: Signal Processing for Wireless II

- Chair: Colin Frank (Motorola Mobility LLC, USA)
Room: Fontaine F
- 16:30 *Optimal Receiver Design for SCMA System*
Guangjin Chen, Jincheng Dai, Kai Niu and Chao Dong (Beijing University of Posts and Telecommunications, P.R. China)
- 16:48 *Downlink Performance of Dense Antenna Deployment: To Distribute or Concentrate?*
Mounia Hamidouche (EURECOM, France); Ejder Bastug (MIT & CentraleSupélec, USA); Jihong Park (Aalborg University, Denmark); Laura Cottarelli (EURECOM, France); Mérouane Debbah (Huawei, France)
- 17:06 *An Integrated Design of STBC and Signal Alignment in MIMO Y Channels*
Zichao Zhou, Xueying Yuan and Jacek Ilow (Dalhousie University, Canada)
- 17:24 *Mapping Antenna Precoders to Equal Power Antenna Patterns*
Colin Frank (Motorola Mobility LLC, USA); Tyler Alan Brown (Motorola, USA)
- 17:42 *The New Enhancements in LTE-A Rel-13 for Reliable Machine Type Communications*
Mahmoud Elsaadany and Walaa Hamouda (Concordia University, Canada)

Wednesday, October 11

09:00 - 10:30

TR1/S16: Beamforming II

- Chair: Alireza S. Behbahani (University of California, Irvine, USA)
Room: Fontaine C
- 09:00 *Adaptive Digital Precoder Codebook Resolution for Millimeter Wave Hybrid Beamforming*
Ping-Heng Kuo (InterDigital Europe, United Kingdom (Great Britain)); Jaehyun Ahn (InterDigital, Korea); Alain Abdel-Majid Mourad (Interdigital Europe Ltd, United Kingdom (Great Britain))
- 09:18 *Partially Connected Hybrid Beamforming for Large Antenna Arrays in Multi-User MISO Systems*
Mohammad Majidzadeh, Aleksi Moilanen, Nuutti Tervo, Harri Pennanen and Antti Tölli (University of Oulu, Finland); Matti Latva-aho (UoOulu, Finland)
- 09:36 *Outage Probability-based Beamforming Design for Multi-Cell Multicast Networks*
Juwendo Denis (Institut Telecom / Telecom SudParis, France); Sinda Smirani (Telecom SudParis, France); Bakarime Diomande (TSP RS2M, France); Takoua Ghariani (Institut Telecom / Telecom SudParis, France); Badi Jouaber (Institut TELECOM - Telecom SudParis & cnrs UMR-SAMOVAR, France)
- 09:54 *Gradient Based Decentralized Joint Beamforming*
Jarkko Kaleva, Antti Tölli and Markku Juntti (University of Oulu, Finland); Randall A Berry and Michael Honig (Northwestern University, USA)
- 10:12 *An Improved Koch Snowflake Fractal Multiband Antenna*
Zhen Yu (Beijing University of Posts and Telecommunications, North China Institute of Science and Technology, P.R. China); Jianguo Yu (Beijing University of Posts and Telecommunications, P.R. China); Xiaoying Ran (North China Institute of Science and Technology, P.R. China)

TR1/S17: Cooperative Communications II

- Chair: Aria Nosratinia (University of Texas, Dallas, USA)
Room: Fontaine D
- 09:00 *Decode-Compress and Forward Relay: AWGN and Constellation Constrained Channels*
Ahmed Abotabl (University of Texas at Dallas, USA); Aria Nosratinia (University of Texas, Dallas, USA)
- 09:18 *Relay Selection and Residual Self-Interference Mitigation for Cognitive Full-Duplex Two-Way MIMO Relaying System*
Nachiket Ayir (IIIT Hyderabad, India); P Ubaidulla (International Institute of Information Technology, India)
- 09:36 *Robust Design of SC-FDE Based Two-way Relay Systems Under Channel Uncertainty*
Peiran Wu and Minghua Xia (Sun Yat-sen University, P.R. China)
- 09:54 *Full-Duplex Relays Under Multilevel Coding: Correlation Design via*

Modulation Labeling

- Ahmed Abotabl (University of Texas at Dallas, USA); Aria Nosratinia (University of Texas, Dallas, USA)
- 10:12 *Wireless Bidirectional Relaying Using Physical Layer Network Coding with Heterogeneous PSK Modulation*
Chinmayananda Arunachala, Saket Buch and B. Sundar Rajan (Indian Institute of Science, India)

TR1/S18: Positioning, Localization, and Tracking I

- Chair: Slim Zaidi (University of Quebec, INRS-EMT, Canada)
Room: Fontaine E
- 09:00 *Accurate Range-Free ANN-based Localization in 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-Témiscamingue, Canada)
- 09:18 *Three-Dimensional Dynamic Channel Modeling and Tracking for Terahertz Band Indoor Communications*
Shuai Nie and Ian F. Akyildiz (Georgia Institute of Technology, USA)
- 09:36 *RSSI-Based Self-Localization with Perturbed Anchor Positions*
Vikram Kumar (University of Queensland, Australia); Reza Arablouei (CSIRO, Australia); Raja Jurdak (Commonwealth Scientific and Industrial Research Organisation (CSIRO) ICT Centre & University of Queensland, Australia); Branislav Kusy (Commonwealth Scientific and Industrial Research Organisation (CSIRO) ICT Centre, Australia); Neil W Bergmann (University of Queensland, Australia)
- 09:54 *Please Stand By: TV-based Indoor Localization*
Andrei Popleteev (University of Luxembourg, Luxembourg)
- 10:12 *A Method to Enhance Ranging Resolution for Localization of LoRa Sensors*
Haris Kremo (CONNECT Centre, Trinity College, Ireland); Tom Farrell (Danalto Ltd., Ireland); Justin Tallon (University of Dublin, Trinity College & CTVR, Ireland); David McDonald (Danalto Ltd., Ireland); Linda Doyle (Trinity College Dublin, Ireland)

TR1/S19: Security II

- Chair: Tolga M. Duman (Bilkent University, Turkey)
Room: Fontaine F
- 09:00 *Achieving Perfect Secrecy Capacity of an Asymmetric Bidirectional Relay Channel*
Yacine Meziti (Beijing Institute of Technology & National Agency of Frequencies, Algeria); Hua Wang (Beijing Institute of Technology, P.R. China)
- 09:18 *Transmit Signal Design for MIMO Wiretap Channels with Statistical CSI and Arbitrary Inputs*
Sina Rezaei Aghdam and Tolga M. Duman (Bilkent University, Turkey)
- 09:36 *Enhancing Physical Layer Security of OFDM Systems Using Channel Shortening*
Haji Muhammad Furqan Ahmed Madni (Istanbul Medipol University & School of Engineering and Natural Science Electrical, Electronics and Cyber Systems, Turkey); Jehad Hamamreh (Istanbul Medipol University, Turkey); Huseyin Arslan (University of South Florida, USA)
- 09:54 *Deep Learning for Malicious Flow Detection*
Yun-Chun Chen, Yu-Jhe Li, Aragorn Tseng and Tsungnan Lin (National Taiwan University, Taiwan)
- 10:12 *Constant Envelope Precoding for Secure Millimeter-Wave Wireless Communication*
Jianjun Zhang (Southeast University, P.R. China); Fusheng Zhu (ZTE Corporation, P.R. China); Yongming Huang and Luxi Yang (Southeast University, P.R. China)

TR1/S20: Signal Processing for Wireless III

- Chair: Olivier Berder (University of Rennes 1 / IRISA, France)
Room: Fundy
- 09:00 *Minimal Distance Approach for Studying Multi-form MIMO Precoders, Application to Finite-SNR DMT*
Thanh-Tin Nguyen (University Blaise Pascal, France); Baptiste Vigneau (University of Rennes 1 & IRISA Granit, France); Olivier Berder (University of Rennes 1 / IRISA, France)

- 09:18 **Linear Precoder and Decoder Design for Bidirectional Full-Duplex MIMO OFDM Systems**
Omid Taghizadeh and Vimal Radhakrishnan (RWTH Aachen University, Germany); Ali Cagatay Cirik (University of British Columbia, Canada); Saeed Shojaei and Rudolf Mathar (RWTH Aachen University, Germany); Lutz Lampe (University of British Columbia, Canada)
- 09:36 **Experimental Over-The-Air Testing for Coexistence of 4G and A Spectrally Efficient Non-Orthogonal Signal**
Tongyang Xu and Izzat Darwazeh (University College London, United Kingdom (Great Britain))
- 09:54 **Level-Crossing Rate and Average Duration of Fades of Non-Stationary Multipath Fading Channels**
Matthias Pätzold (University of Agder, Norway); Wiem Dahech (Ecole Supérieure des Communications de Tunis, Sup'com, Tunisia); Neji Youssef (Ecole supérieure des communications de Tunis, Tunisia)
- 10:12 **Joint Subchannel Allocation and Hybrid Precoding Design for mmWave Multiuser OFDMA Systems**
Vu Nguyen Ha (Ecole Polytechnique de Montreal); Duy H. N. Nguyen (San Diego State University, USA); Jean-François Frigon (Ecole Polytechnique de Montreal and GERAD, Canada)

Wednesday, October 11
13:30 - 15:00

TR1/S21: 5G Physical Layer II

- Chair: Tamer Khattab (Qatar University, Qatar)
Room: Fontaine C
- 13:30 **Joint Coding for Proactive Caching with Changing File Popularities**
Mohamed Amir Khalil (Memorial University, Canada); Ebrahim Bedeer (Ulster University, United Kingdom (Great Britain)); Mohamed Hossam Ahmed (Memorial University, Canada); Tamer Khattab (Qatar University, Qatar)
- 13:48 **An SDR-based Turbo-SIC Implementation: Towards a 5G New Radio Advanced Receiver for Uplink Boosting**
Milan Zivkovic and Juergen Otterbach (Nokia Bell Labs, Germany); Marcos B.S. Tavares, Dale Harman and Dragan Samardzija (Nokia Bell Labs, USA)
- 14:06 **The Impact of Adaptive Guards for 5G and Beyond**
Ali Demir and Huseyin Arslan (University of South Florida, USA)
- 14:24 **Reinforcement Learning System to Mitigate Small-Cell Interference Through Directionality**
Anton Paatelma (Center for Wireless Communications, University of Oulu, Finland); Danh H. Nguyen (Drexel University, USA); Harri Saarnisaari (Centre for Wireless Communications, Finland); Nagarajan Kandasamy and Kapil Dandekar (Drexel University, USA)
- 14:42 **Adaptive Windowing of Insufficient CP for Joint Minimization of ISI and ACI Beyond 5G**
Berker Pekoz, Selçuk Köse and Huseyin Arslan (University of South Florida, USA)

TR1/S22: Energy Harvesting and Power Transfer

- Chair: Dushantha Nalin K. Jayakody (National Research Tomsk Polytechnic University, Russia)
Room: Fontaine D
- 13:30 **Transmission Design with RF Energy Harvesting over Wireless Multi-Access Channels**
Fateme Amirnavaei (UOIT, Canada); Min Dong and Jiawei Yu (University of Ontario Institute of Technology, Canada)
- 13:48 **Power Control in ARQ Transmission with Wireless Energy Replenishment**
Sixing Yin, Lihua Li and ZhaoWei Qu (Beijing University of Posts and Telecommunications, P.R. China)
- 14:06 **Wireless-Powered NOMA Relays for Out-of-Coverage Devices**
Syeda Kanwal Zaidi, Syed Faraz Hasan and Xiang Gui (Massey University, New Zealand)
- 14:24 **Energy-Harvesting User Fairness in Wireless Information and Power Transfer OFDMA Networks**

- Jithin George (University of Melbourne); Phee Lep Yeoh (University of Sydney, Australia); Brian Krongold (University of Melbourne, Australia)
- 14:42 **Successful One Way Data Communication Probability of Energy Harvesting Cognitive Relay Network with Spatially Random Primary Users**
Anupam Shome (IIT Kharagpur, India); Saswat Chakrabarti (G. S. Sanyal School of Telecommunications & Indian Institute of Technology, Kharagpur, India); Priyadip Ray (IIT Kharagpur, USA)

TR1/S23: Equalization, Detection, and Signal Processing

- Chair: Ridha Hamila (Qatar University, Qatar)
Room: Fontaine E
- 13:30 **Maximum Likelihood Detection of Precoded SFBC in Frequency-Selective Fading Channels**
Arafat Al-Dweik (Khalifa University, United Arab Emirates); Ridha Hamila (Qatar University, Qatar); O. Filio Rodriguez (Sidsense Corp, Canada); Lutfi Samara (Qatar University, Qatar)
- 13:48 **Low Complexity Equalization Algorithms for Frequency Selective Millimeter Wave Channel**
Gaojian Wang (RWTH-Aachen, Germany); Jiaxin Sun and Gerd H. Ascheid (RWTH Aachen University, Germany)
- 14:06 **Maximum Likelihood Detection of Precoded SFBC in Frequency Selective Fading Channels**
Ridha Hamila (Qatar University, Qatar); O. Filio Rodriguez (Sidsense Corp, Canada); Lutfi Samara (Qatar University, Qatar)
- 14:24 **Performance of Frequency Domain Multiuser-MIMO Turbo Equalization Without Cyclic Prefix**
Yasuhiro Takano (Kobe University, Japan); Hsuan-Jung Su (National Taiwan University, Taiwan)
- 14:42 **Uplink HARQ CoMP with ZF Receivers in Limited Backhaul**
Ali Asghar Haghighi (University of Ontario Institute of Technology & McGill University, Canada); Tho Le-Ngoc (McGill University, Canada)

TR1/S24: Interference II

- Chair: Hayato Fukuzono (NTT Corporation, Japan)
Room: Fontaine F
- 13:30 **On the Performance of a Widely Linear SC-FDE System Under Multiple Independent Interferences**
Bruno Chang (Federal University of Technology - Paraná, Brazil); Carlos Aurélio Faria da Rocha (Federal University of Santa Catarina & Communication Research Group (GPqCom), Brazil); Hayfa Fhima (Conservatoire National des arts et Metiers & Ecole Supérieure des Communications de Tunis, France); Rafik Zayani (Innov'COM, Sup'Com, Tunisia); Hmaied Shaiek (CNAM, France); Daniel Roviras (Cnam, France)
- 13:48 **A Novel Blind Interference Cancellation Receiver for LTE Uplink SC-FDMA Systems**
Min Sagong and Sungnam Hong (Samsung Electronics Co., Ltd., Korea); Taeyoung Kim and Ji-Yun Seol (Samsung Electronics, Korea)
- 14:06 **Self-Interference Cancellation with Optimal Feedback Path Selection on Full-Duplex Relay Systems**
Hayato Fukuzono, Teruyoshi Shinagawa, Masafumi Yoshioka and Hiroyuki Nakamura (NTT Corporation, Japan)
- 14:24 **Relaying with Signal Space Diversity in the Presence of Co-Channel Interference**
Amir H. Forghani (INRS, University of Quebec, Montreal QC, Canada); Salama Said Ikki (Lakehead University, Canada); Sonia Aïssa (INRS, University of Quebec, Canada)
- 14:42 **On Optimal Receiver for Nonlinearly Distorted Single Carrier Signal**
Ilia Yoffe (Iofedov) and Nir Regev (Ben Gurion University of the Negev, Israel); Dov Wulich (Ben Gurion University, Israel)

TR1/S25: Massive MIMO II

- Chair: Wessam Ajib (Université du Québec à Montréal, Canada)
Room: Fundy
- 13:30 **Ultra-High-Throughput Massive MIMO Field-Trial over Radio Computing Architecture with Peak Spectrum Efficiency of 79.82 bps/Hz**
Wenliang Liang (Huawei Technologies Co. Ltd.); Yuanquan Wang (Huawei)

	Technologies Co. Ltd., P.R. China); Bojie Li (Huawei Technologies Co. Ltd.); Wenhui Wang (Huawei Technologies Co. Ltd., P.R. China); Jie Sheng and Yuchao Han (Huawei Technologies Co. Ltd., P.R. China); Haihua Shen (Huawei Technologies Co., Ltd., P.R. China); Liang Gu (Huawei Technologies Co., Ltd., P.R. China); Yuya Saito, Anass Benjebbour and Yoshihisa Kishiyama (NTT DOCOMO, INC., Japan); Xin Wang and Xiaolin Hou (DOCOMO Beijing Communications Laboratories Co., Ltd., P.R. China); Huiling Jiang (DOCOMO Beijing Communications Laboratories Co., Ltd., P.R. China)	17:06
13:48	Cell-Free and User-Centric Massive MIMO at Millimeter Wave Frequencies Stefano Buzzi (University of Cassino and Lazio Meridionale/CNIT, Italy); Mario Alonzo (University of Cassino and Lazio Meridionale, Italy)	17:24
14:06	Uplink/Downlink Achievable Rate Analysis of Heterogeneous Networks with Massive MIMO Full-Duplex Backhaul Link Prince Anokye, Roger Ahidormey and Kyoung-Jae Lee (Hanbat National University, Korea)	17:42
14:24	Quantum-Inspired Evolutionary Algorithm for Large-Scale MIMO Detection Mohammed A.I. Teeti (Southern University of Science and Technology of China, P.R. China); Hua Chen (Wuhan Textile University, P.R. China); Rui Wang (The South University of Science and Technology of China, P.R. China); Qiang Ni (Lancaster University, United Kingdom (Great Britain)); Yingzhuang Liu (Huazhong University of Science and Technology, P.R. China)	
14:42	Deep Convolutional Neural Networks for Massive MIMO Fingerprint-Based Positioning Joao Vieira (Lund University, Sweden); Erik Leitinger (Lund University & Graz University of Technology, Austria); Muris Sarajlic, Xuhong Li and Fredrik Tufvesson (Lund University, Sweden)	

TR1/S26: Source/Channel Coding II

Chair:	Jincheng Dai (Beijing University of Posts and Telecommunications, P.R. China)
Room:	St-Michel
13:30	Joint Optimization of Polar Codes and STBCs Hossein Khoshnevis and Ian D. Marsland (Carleton University, Canada); Hamid Jafarkhani (University of California, Irvine, USA); Halim Yanikomeroglu (Carleton University, Canada)
13:48	Triple Parallel Concatenated Trellis Coded Modulation Toshiki Matsumine and Hideki Ochiai (Yokohama National University, Japan)
14:06	Optimal Linear Error-Correcting Index Codes for Some Generalized Index Coding Problems Simon Samuel, Nujoom Sageer Karat and B. Sundar Rajan (Indian Institute of Science, India)
14:24	Design of Polar Coding for GFDM System Yan Li, Jincheng Dai, Kai Niu and Chao Dong (Beijing University of Posts and Telecommunications, P.R. China)
14:42	Wyner-Ziv Nested Lattice Coding for Single-Cell Multicast Service Delivery Sinda Smirani (Telecom SudParis, France); Juwendo Denis and Takoua Ghariani (Institut Telecom / Telecom SudParis, France); Bakarime Diomande (TSP RS2M, France); Badji Jouaber (Institut TELECOM - Telecom SudParis & cnrs UMR-SAMOVAR, France)

Wednesday, October 11

16:30 - 18:00

TR1/S27: Channel Estimation II

Chair:	Hayato Fukuzono (NTT Corporation, Japan)
Room:	Fontaine C
16:30	CFO Estimation for QAM-FBMC Systems Considering Non-orthogonal Prototype Filters Hyungsik Han (Korea Advanced Institute of Science and Technology, Korea); Hyuncheol Park (KAIST, Korea)
16:48	On the Optimum Preamble Design for Channel Estimation in FBMC-OQAM Systems Waqas Anjum (Center for Advanced Studies in Engineering, CASE, Islamabad, Pakistan); Muhammad Danish Nisar (Center for Advanced Studies/Research in Engineering (CASE/CARE), Pakistan & Technical University Munich, TUM, Germany)

17:06	TOA Estimation Improvements in Multipath Environments by Measurement Error Models Andreas Bergström (Linköping University & Ericsson Research, Sweden); Gustaf Hendeby (Linköping University, Sweden); Fredrik Gunnarsson (Linköping University & Ericsson Research); Fredrik Gustafsson (Linköping University, Sweden)
17:24	Frame Error Rate Prediction for WLAN Systems with Multiband Simultaneous Transmission Norisato Suga (ATR, Japan); Naoto Egashira (ATR Wave Engineering Laboratories, Japan); Kazuto Yano and Tomoaki Kumagai (ATR, Japan)
17:42	Channel Estimation with Scattered Pilots in GFDM with Multiple Subcarrier Bandwidths Yuta Akai, Yuka Enjoji and Yukitoshi Sanada (Keio University, Japan); Ryota Kimura, Hiroki Matsuda, Naoki Kusashima and Ryo Sawai (Sony Corporation, Japan)

TR1/S28: D2D Communications II

Chair:	Shah Ahsanuzzaman Md Tariq (PolyMtl & Poly-Grames Research Center, Canada)
Room:	Fontaine D
16:30	Energy Optimization of D2D Communications Using Relay Devices and Data Entropy Romain Chevillon (Université de Nantes, France); Guillaume Andrieux (University of Nantes & IETR Laboratory, France); Jean Francois Diouris (University of Nantes, France)
16:48	Joint Mode Selection and Proportional Fair Scheduling for D2D Communication Xiaoshuai Li (Harbin Institute of Technology, P.R. China & Macquarie University, Australia); Lin Ma (Harbin Institute of Technology, P.R. China); Rajan Shankaran and Mehmet Orgun (Macquarie University, Australia); Gengfa Fang (University of Technology Sydney, Australia)
17:06	Iterative Interference Alignment in Device-to-Device LAN with Cellular Networks Dan Wang and Qian Cheng (Institution of Information Engineering, University of Chinese Academy of Sciences, P.R. China); Weihua Liu (Institution of Information Engineering, Chinese Academy of Sciences & University of Chinese Academy of Sciences, P.R. China); Shunliang Zhang and Yongming Wang (Institute of Information Engineering, Chinese Academy of Sciences, P.R. China)
17:24	Improving D2D Communications Using 3D Beamforming in 5G Wireless Networks William Diego and Jean-Marc Kelif (Orange Labs, France)
17:42	Impact of RF Cables on the Electromagnetic Environment in Vehicles Irfan Yousaf (Lunds University & Volvo Cars Corporation, Sweden); Buon Kiong Lau (Lund University, Sweden)

TR1/S29: mm-Wave Communications

Chair:	Berna Bulut (University of Bristol, United Kingdom (Great Britain))
Room:	Fontaine E
16:30	LoS Communications Using Large Circular Array for mmWave C-RAN Network Jiayi Chen and Shengli Zhang (Shenzhen University, P.R. China)
16:48	Novel Two-step Beam Search Method for Multi User Millimeter-wave Communication Chikara Kojima, Shunsuke Fujio, Kenichi Nishikawa and Kazuyuki Ozaki (Fujitsu Laboratories Ltd., Japan); Zhengyi Li (Fujitsu Laboratories Ltd, Japan); Atsushi Honda, Shohei Ishikawa, Takenori Ohshima, Hiroshi Ashida and Toshihiro Shimura (Fujitsu Laboratories Ltd., Japan); Masahiko Shimizu (Fujitsu Laboratories Ltd, Japan); Yoji Ohashi (Fujitsu, Japan)
17:06	Fast Beam Training in mmWave Multiuser MIMO Systems with Finite-Bit Phase Shifters Chengpeng Chang (Southeast University, P.R. China); Fu-Chun Zheng (University of York, United Kingdom (Great Britain) & Southeast University, P.R. China); Shi Jin (Southeast University, P.R. China)
17:24	Leakage-Based Hybrid Beamforming Design for Downlink Multiuser mmWave MIMO Systems

- 17:42 Didi Zhang and Yafeng Wang (Beijing University of Posts and Telecommunications, P.R. China); Wei Xiang (James Cook University, Australia)
Hybrid Beamforming for Indoor mmWave Multi-Carrier Systems Under Sub-System SVD
Tzung-Hua Tsai and Chi-chao Chao (National Tsing Hua University, Taiwan)

TR1/S30: Modulation II

- Chair: Faouzi Bellili (University of Toronto, Canada)
Room: Fontaine F
16:30 **Message Passing Receivers for Large-scale Multiuser Media-based Modulation**
Swaroop Jacob (Indian Institute of Science, Bangalore, India); Lakshmi Narasimhan Theagarajan (Indian Institute of Technology, Palakkad, India); A. Chockalingam (Indian Institute of Science, India)
16:48 **PFS: A Novel Modulation Classification Scheme for Mixed Signals**
Kezhong Zhang (Beijing University of Posts and Telecommunications, P.R. China); 'Easton' Li Xu (Texas A&M University, USA); Zhiyong Feng (Beijing University of Posts and Telecommunications, P.R. China)
17:06 **A Multi-Modulation Retrodirective Feed Network for Backscatter Communications**
Mohammad Alhassoun and Francesco Amato (Georgia Institute of Technology, USA); Gregory Durgin (Georgia Tech, USA)
17:24 **Performance Analysis of OFDM with Quadrature Index Modulation in the Presence of Hardware Impairment**
Asma Bouhlel (Laboratory of Electronic and Microelectronic, Tunisia); Islam Abu Mahady (Lakehead University, Canada); Sakly Anis (ENIM, Tunisia); Salama Said Ikki (Lakehead University, Canada)
17:42 **Constellation Shaping for IEEE 802.11**
Yunus Can Gultekin (Eindhoven University of Technology & NXP Semiconductors, The Netherlands); Wim van Houtum (Tu/e, The Netherlands); Semih Serbetli (NXP Semiconductors, The Netherlands); Frans MJ Willems (Technical University Eindhoven, The Netherlands)

TR1/S31: PHY-Layer Designs Under Practical Constraints

- Chair: Xiaojie Wang (University of Stuttgart, Germany)
Room: Fundy
16:30 **Low Complexity Resource Allocation for QF VMIMO Receivers with a Shared Backhaul**
Tim Rüegg (ETH Zurich, Switzerland); Yahia Hassan (ETHZ, Switzerland); Armin Wittneben (ETH Zurich, Switzerland)
16:48 **Enhanced Universal Filtered-DFTs-OFDM for Long-delay Multi-path Environment**
Yuji Mizutani, Hiroto Kuriki, Yosuke Kodama and Keiichi Mizutani (Kyoto University, Japan); Takeshi Matsumura (Kyoto University & National Institute of Information and Communications Technology (NICT), Japan); Hiroshi Harada (Kyoto University, Japan)
17:06 **Density Evolution Thresholds for Noise-Against-Noise Min-Sum Decoders**
Franklin Cochachin Henostroza (ETIS-ENSEA, France); David Declercq (ETIS ENSEA/univ. of Cergy-Pontoise/CNRS, France); Emmanuel Boutillon (Université de Bretagne Sud, France); Lounis Kessal (ETIS-ENSEA, France)
17:24 **On Peak to Average Power Ratio of Universal Filtered OFDM Signals**
Xiaojie Wang, Simon A. Burkert and Stephan ten Brink (University of Stuttgart, Germany)
17:42 **LTE IoT Link Budget and Coverage Performance in Practical Deployments**
István Z. Kovács (Nokia Bell Labs & Aalborg, Denmark); Preben Mogensen (Nokia Siemens Networks, Aalborg, Denmark); Mads Lauridsen and Thomas Jacobsen (Aalborg University, Denmark); Krzysztof Bakowski (Nokia Bell Labs, Poland); Poul Larsen (Nokia, Denmark); Nitin Mangalvedhe and Rapeepat Ratasuk (Nokia Bell Labs, USA)

Thursday, October 12

09:00 - 10:30

TR1/S32: 5G Physical Layer III

- Chair: Milan Zivkovic (Nokia Bell Labs, Germany)

- Room: Fontaine C
09:00 **Performance Optimization of Co-Existing Underlay Secondary Networks**
Pratik Chakraborty (Indian Institute of Technology Delhi, India); Shankar Prakriya (Indian Institute of Technology, Delhi, India)
09:18 **UFMC-based Wideband Spectrum Sensing for Cognitive Radio Systems in Non-Gaussian Noise**
Djamel Eddine Kebiche and Ali Baghaki (McGill University, Canada); Xiaomei Zhu (Nanjing Tech University, P.R. China); Benoit Champagne (McGill University, Canada)
09:36 **Wireless Technology Identification Using Deep Convolutional Neural Networks**
Naim Bitar (The University of Oklahoma, USA); Siraj Muhammad (University of Oklahoma, USA); Hazem Refai (Oklahoma University, USA)
09:54 **Joint Hybrid RF/Baseband Transceiver Design for Multi-User MIMO Downlink in Millimeter Wave Communication System**
Deepa Jagyasi (International Institute of Information Technology, Hyderabad, India); P Ubaidulla (International Institute of Information Technology, India)
10:12 **Weighted Fast Iterative Shrinkage Thresholding for 3D Massive MIMO Channel Estimation**
Ahmed Nasser Ahmed (Egypt-Japan University of Science and Technology (E-JUST) & Suez Canal University, Egypt); Maha Elsabrouty (Egypt Japan University for Science and Technology, Egypt); Osamu Muta (Kyushu University, Japan)

TR1/S33: Channel Estimation III

- Chair: István Z. Kovács (Nokia Bell Labs & Aalborg, Denmark)
Room: Fontaine D
09:00 **2-Step Phase Rotation Estimation for Low-PAPR Signal Transmission Using Blind Selected Mapping**
Amnat Boonkajay and Fumiyuki Adachi (Tohoku University, Japan)
09:18 **Hybrid Beamforming and DFT-Based Channel Estimation for Millimeter Wave MIMO Systems**
Maliheh Soleimani, Robert C. Elliott and Witold A. Krzymien (University of Alberta, Canada); Jordan Melzer (TELUS Communications, Canada); Pedram Mousavi (University of Alberta, Canada)
09:36 **Integrated Acquisition and Tracking Scheme for Channel Estimation in Millimeter Wave Wireless Networks**
Laxminarayana Pillutla (Dhirubhai Ambani-Institute of Information and Communication Technology, India); Ramesh Annavajjala (Northeastern University, USA)
09:54 **Predictor Antennas in Action**
Joachim Björnell and Mikael Sternad (Uppsala University, Sweden); Michael Grieger (Airrays GmbH, Germany)
10:12 **Imperfect CSI Impact on Sum-Rate Performance of IA: A Comprehensive Analysis**
Weihua Liu (Institution of Information Engineering, Chinese Academy of Sciences & University of Chinese Academy of Sciences, P.R. China); Xiaona Li (Institute of Information Engineering, Chinese Academy of Sciences, P.R. China); Dan Wang and Qian Cheng (Institution of Information Engineering, University of Chinese Academy of Sciences, P.R. China); Yongming Wang (Institute of Information Engineering, Chinese Academy of Sciences, P.R. China)

TR1/S34: Massive MIMO III

- Chair: Min Dong (University of Ontario Institute of Technology, Canada)
Room: Fontaine E
09:00 **Hybrid Sum Rate Maximization Beamforming for Multi-user Massive MIMO Millimeter Wave System**
Qianrui Li (Mitsubishi Electric R&D Centre Europe, France); Hadi Nouredine (Lebanese International University, France)
09:18 **What User-Cell Association Algorithms Will Perform Best in mmWave Massive MIMO Ultra-Dense HetNets?**
Sinasi Cetinkaya, Umair Hashmi and Ali Imran (University of Oklahoma, USA)
09:36 **Energy Efficiency Optimization in Large-Scale Distributed MIMO Systems over K Fading Channels**
Guangyan Lu, Lihua Li and Liutong Du (Beijing University of Posts

- and Telecommunications, P.R. China); Hui Tian (Beijing university of posts and telecommunications, P.R. China)
- 09:54 **Energy-Aware User Association in Heterogeneous Networks with Renewable Energy Supplies**
Jiazhen Zhang, Xiaofeng Tao, Xuefei Zhang and Huici Wu (Beijing University of Posts and Telecommunications, P.R. China)
- 10:12 **Robust Phase-Based Positioning Using Massive MIMO with Limited Bandwidth**
Xuhong Li, Kenneth Batstone, Kalle Åström, Magnus Oskarsson, Carl Gustafson and Fredrik Tufvesson (Lund University, Sweden)

TR1/S35: Modulation III

- Chair: Abdelaziz Samet (INRS-EMT, Canada)
Room: Fontaine F
- 09:00 **Code-aided Antenna Selection for Spectrally Shaped DFT-precoded OFDM Spatial Modulation**
Bilel Raddadi and Nathalie Thomas (University of Toulouse, France); Charly P oulliat (INP - ENSEEIHT Toulouse, France); Marie-Laure Boucheret (University of Toulouse IRT Enseeiht, France)
- 09:18 **A New Modulation Technique for Doppler Compensation in Frequency-Dispersive Channels**
Thomas Dean, Mainak Chowdhury and Andrea Goldsmith (Stanford University, USA)
- 09:36 **Frozen-Sequence Constrained High-Order Polar-Coded Modulation**
Jincheng Dai, Kai Niu and Jiaru Lin (Beijing University of Posts and Telecommunications, P.R. China)
- 09:54 **Random Phase Modulation in Load Modulated Arrays**
Sandeep Bhat and A. Chockalingam (Indian Institute of Science, India)
- 10:12 **A High Resolution Method for Equipment Group Mapping Using UWB Signals**
Thomas Varela Santana (Orange Labs & Supelec, France); Siham Arreffag and Sofia Martinez Lopez (Orange Labs, France)

TR1/S36: Signal Processing for Wireless IV

- Chair: Faouzi Bellili (University of Toronto, Canada)
Room: Fundy
- 09:00 **The Improved-Iterative Support Detection Algorithm for Pulse-Position-Modulation ADC Architecture**
Mengyue Liu, Yu Liu and Yumei Wang (Beijing University of Posts and Telecommunications, P.R. China)
- 09:18 **Gibbs Sampling MIMO Detection with Maximum Ratio Combining**
Yukitoshi Sanada (Keio University, Japan)
- 09:36 **RF Pulse Width Modulator with Reduced Spectral Regrowth**
Alexander N. Lozhkin (Fujitsu Laboratories Ltd., Japan); Kazuo Nagatani (Fujitsu Laboratories Limited, Japan); Maniwa Toru (Fujitsu Laboratories LTD., Japan)
- 09:54 **A Novel Digital Predistorter Compensating for Even-Order Distortions of Concurrent Multi-Band Power Amplifiers with a Single Common Feedback Loop**
Tomoya Ota and Toshio Kawasaki (Fujitsu Limited, Japan); Shigekazu Kimura (Fujitsu Limited); Ken Tamanoi (Fujitsu Limited, Japan); Maniwa Toru (Fujitsu Limited); Makoto Yoshida (Fujitsu Laboratories Ltd., Japan)
- 10:12 **Empirical Evaluation of Indoor Multi-User MIMO Channels with Linear and Planar Large Antenna Arrays**
Bei Zhang and Zhangdui Zhong (Beijing Jiaotong University, P.R. China); Bo Ai (Beijing Jiaotong University & State Key Lab of Rail Traffic Control and Safety, P.R. China); Ruishi He (Beijing Jiaotong University, P.R. China); Fredrik Tufvesson and Jose Flordelis (Lund University, Sweden); Qi Wang and Jianzhi Li (Beijing Jiaotong University, P.R. China)

TR1/S37: Optical Wireless I

- Chair: Imene Trigui (University of Toronto, Canada)
Room: Longueuil
- 09:00 **BER of an Optically Pre-amplified FSO System Under Málaga Turbulence, Pointing Errors, and ASE Noise**
Prakriti Saxena (Indian Institute of Technology Delhi, India); Aashish Mathur (Indian Institute of Technology (BHU) - Varanasi, India); Manav Bhatnagar

- (Indian Institute of Technology Delhi, India); Zabih Ghassemloo (Northumbria University, United Kingdom (Great Britain))
- 09:18 **Experimental Study of the Beam Wander Mitigation in Free Space Optical Communications Using Single Input Multiple Output System**
Muhammad Ijaz (Manchester Metropolitan University, Manchester, United Kingdom (Great Britain)); George Harris and Bamidele Adebisi (Manchester Metropolitan University, United Kingdom (Great Britain)); Sujana Rajbhandari (Coventry University, United Kingdom (Great Britain)); Wasia O. Popoola (University of Edinburgh, United Kingdom (Great Britain))
- 09:36 **A Novel Phase Estimation Algorithm Mitigating Atmospheric Turbulence in Coherent Wireless Optical Communications (WITHDRAWN)**
Kaiyue Wang, Jiankun Zhang and Anhong Dang (Peking University, P.R. China)
- 09:54 **Achievable Data Rate of Coordinated Multi-Point Transmission for Visible Light Communications**
Alexis Alfredo Dowhuszko (Centre Tecnològic de Telecomunicacions de Catalunya (CTTC), Spain); Ana Pérez-Neira (CTTC, Spain)
- 10:12 **Session Adjournment**

Thursday, October 12

13:30 - 15:00

TR1/S38: Cooperative Communications III

- Chair: Sumit Gautam (University of Luxembourg, Luxembourg)
Room: Fontaine C
- 13:30 **Energy-efficient Joint Source and Relay Precoding for Two-hop MIMO-AF Systems with Two Relays (WITHDRAWN)**
Fabien Hélot and Rahim Tafazolli (University of Surrey, United Kingdom (Great Britain))
- 13:48 **Capacity Regions of a MAC with a Wireless-Powered Relay-to-Destination Link Under Different Relay Strategies**
Runfa Zhou (The Hong Kong University of Science and Technology, Hong Kong); Roger Cheng (HKUST, Hong Kong)
- 14:06 **Relay Selection Strategies for SWIPT-Enabled Cooperative Wireless Systems**
Sumit Gautam (University of Luxembourg, Luxembourg); Eva Lagunas (University of Luxembourg - SnT, Luxembourg); Shree Krishna Sharma (University of Western Ontario, Canada); Symeon Chatzinotas (University of Luxembourg, Luxembourg); Björn Ottersten (University of Luxembourg, Luxembourg)
- 14:24 **A New Approach to Cooperative NOMA Using Distributed Space Time Block Coding**
Muhammad Nasar Jamal (National University of Science and Technology, Pakistan); Syed Ali Hassan (National University of Sciences and Technology, Pakistan); Dushantha Nalin K. Jayakody (National Research Tomsk Polytechnic University, Russia)
- 14:42 **A Layered Detect-Compress-and-Forward Coding Scheme for the Relay Channel**
Fawad Ud Din (McGill University, Canada); Jawwad Nasar Chattha, Irfan Ullah and Momin Uppal (Lahore University of Management Sciences, Pakistan)

TR1/S39: Massive MIMO IV

- Chair: Mohaned Chraiti (Concordia University, Canada)
Room: Fontaine D
- 13:30 **Adaptive Limited Feedback Designs in MIMO Broadcast Systems with Simultaneous Wireless Information and Power Transfer**
Gui Xin, Hao Ni and Meifang Jing (Samsung R&D Center-Beijing, P.R. China)
- 13:48 **Adaptive Beamforming Using Monte-Carlo Algorithm for Multi-Antenna Wireless Power Transfer**
Yubin Zhao (Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, P.R. China); Xiaofan Li (The State Radio Monitoring Center and Testing Center, P.R. China); Chengzhong Xu (Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, USA); Xiaodong Wang (Columbia University, USA)
- 14:06 **Wireless Power Transfer in Cooperative Dual-Hop Relaying Systems with Beamforming over Generalized Fading Channels**

- Osamah S. Badarneh (University of Tabuk, Saudi Arabia); Imran Shafique Ansari (Texas A&M University at Qatar (TAMUQ), Qatar); Kadoch Michel (ETS University of Quebec, Canada); Xiaodong Yang (Xidian University, P.R. China)
- 14:24 **Field Trial on TDD Massive MIMO System with Polar Code**
Wenhui Wang (Huawei Technologies Co. Ltd, P.R. China); Wenliang Liang (, P.R. China); Bojie Li (Huawei Technologies co., P.R. China); Liang Gu (Huawei Technologies Co., Ltd, P.R. China); Jie Sheng (Huawei Technologies Co. Ltd., P.R. China); Pengcheng Qiu (Huawei Technologies Co., Ltd., P.R. China); Jian Wang (Huawei Technologies, P.R. China); Yuanquan Wang (Huawei Technologies Co. Ltd., P.R. China)
- 14:42 **MU-MIMO-OFDM with Spreading Codes for User Separation**
Kei Nakahara, Kosuke Terui and Yukitoshi Sanada (Keio University, Japan)

TR1/S40: Positioning, Localization, and Tracking II

- Chair: Olabisi Emmanuel Falowo (University of Cape Town, South Africa)
Room: Fontaine E
- 13:30 **Performance of OTDOA Positioning in Narrowband IoT Systems**
Kammar Radnosrati, Gustaf Hendeby and Carsten Fritsche (Linköping University, Sweden); Fredrik Gunnarsson (Ericsson Research, Sweden); Fredrik Gustafsson (Linköping University, Sweden)
- 13:48 **Robust Near-Field 3D Localization of an Unaligned Single-Coil Agent Using Unobtrusive Anchors**
Gregor Dumphart, Eric Slottke and Armin Wittneben (ETH Zurich, Switzerland)
- 14:06 **Skew Log-Normal Channel Model for Indoor Cooperative Localization**
Chang Kyung Sung, Shenghong Li and Mark Hedley (CSIRO, Australia); Nasha Nikolic (CSIRO Computational Informatics, Australia); Wei Ni (CSIRO, Australia)
- 14:24 **Improvement of Receiver Sensitivity for Enhancing IR-UWB Performance for Indoor Positioning**
Huan-Bang Li (National Institute of Information and Communications Technology, Japan); Ryu Miura (NICT, Japan); Toshinori Kagawa and Fumihide Kojima (National Institute of Information and Communications Technology, Japan); Hisashi Nishikawa (GIT-Japan Inc., Japan)
- 14:42 **CRAFT Reducing the Effort for Indoor Localisation**
Paul Crane and Zhiyi Huang (University of Otago, New Zealand); Haibo Zhang (University of Otago, New Zealand)

TR1/S41: Security III

- Chair: Mohamed Amine Arfaoui (Concordia University, Canada & Concordia University, Qatar)
Room: Fontaine F
- 13:30 **Robustness of Radiometric Fingerprinting in Presence of an Impersonator**
Saeed Ur Rehman (Auckland University of Technology, New Zealand); Kevin W Sowerby (The University of Auckland, New Zealand); Peter Han Joo Chong (Auckland University of Technology, New Zealand); Shafiq Alam (University of Auckland, New Zealand)
- 13:48 **Safeguarding Multiuser Communication Using Full-Duplex Jamming Receivers**
Xiaoying Qiu (Beijing University of Posts and Telecommunications, P.R. China); Ting Jiang (Beijing University of Posts & Telecommunications, P.R. China)
- 14:06 **Secrecy Capacity Analysis in D2D Underlay Cellular Networks: Colluding Eavesdroppers**
Satyanarayana Vuppala (University of Luxembourg, Luxembourg); Georges Kaddoum (ETS Engineering School, University of Québec, Canada)
- 14:24 **Security Enhancement to Successive Interference Cancellation Algorithm for Non-Orthogonal Multiple Access (NOMA)**
Gandeva Bayu Satrya (Telkom University & Kumoh National Institute of Technology, Indonesia); Soo Young Shin (Kumoh National Institute of Technology, Korea)
- 14:42 **On the Achievable Secrecy Rate of the MIMO VLC Gaussian Wiretap Channel**
Mohamed Amine Arfaoui (Concordia University, Canada & Concordia University, Qatar); Ali Ghayeb (Texas A&M University at Qatar, Qatar); Chadi Assi (Concordia University, Canada)

TR1/S42: Synchronization

- Chair: Faouzi Bellili (University of Toronto, Canada)
Room: Fundy
- 13:30 **Low-Cost Code-Aided ML Timing Recovery from Turbo-Coded QAM Transmissions**
Faouzi Bellili (University of Toronto, Canada); Souheib Ben Amor (INRS-EMT, Canada); Achref Methenni (Institut National de la Recherche Scientifique, INRS-EMT, Montreal, Canada); Sofiene Affes (INRS-EMT, Canada)
- 13:48 **Hybrid Cramer Rao Bound on Time Delay Estimation in Rayleigh Fading Channels**
Imen Nasr (Engineering School of Communications of Tunis SUP'COM, Tunisia); Leila Najjar and Sofiane Cherif (Sup'Com, Tunisia); Benoît Geller (ENSTA ParisTech, France)
- 14:06 **Synchronization Method for Orthogonal Code-based Block Transmission (OCBT) Systems**
Insik Jung, Hyejin Kim, Hyunsoo Kim, Sooyong Choi and Daesik Hong (Yonsei University, Korea)
- 14:24 **On the Accuracy of Passive Hyperbolic Localization in the Presence of Clock Drift**
Saeed Shojaaee, Johannes Schmitz and Rudolf Mathar (RWTH Aachen University, Germany); Sivan Toledo (Tel-Aviv University, Israel)
- 14:42 **Receiver for FTN Signaling in Non-Linear Channel: Joint Channel Estimation and Synchronization**
Jean-Alain Lucciardi (University of Toulouse & IRT Saint Exupery, France); Nathalie Thomas (University of Toulouse, France); Marie-Laure Boucheret (University of Toulouse IRIT Enseeiht, France); Charly Poulliat (INP - ENSEEIHT Toulouse, France); Gilles Mesnager (IRT St Exupery, France)

WS03 - TR1/S43: Coexisting Radio and Optical Wireless (Joint Session)

- Chair: Imene Trigui (University of Toronto, Canada)
Room: St-Michel
- 13:30 **Interference-Limited Mixed Malaga-M and Generalized-K Dual-Hop FSO/RF Systems**
Imene Trigui (University of Toronto, Canada); Nesrine Cherif (INRS, Canada); Sofiene Affes (INRS-EMT, Canada); Xianbin Wang (Western University, Canada); Victor C.M. Leung (University of British Columbia, Canada); Alex Stéphenne (Ericsson & INRS-EMT, Canada)
- 13:48 **Hybrid LiFi - WiFi Indoor Broadcasting System**
Akash Gupta (Netaji Subhas Institute of Technology, India); Parul Garg (Netaji Subhas Institute of Technology, New Delhi, India); Nikhil Sharma (The LNM Institute of Information Technology, Jaipur, India)
- 14:06 **On the Performance of AF Based Mixed Triple-Hop RF/FSO/RF Communication System**
Sanya Anees (Indian Institute of Information Technology - Guwahati, India); P. Sai Shri Harsha (Indian Institute of Information Technology Guwahati, India); Manav Bhatnagar (Indian Institute of Technology Delhi, India)
- 14:24 **WS03 Papers (two presentations at 14:24 and 14:42)**

Thursday, October 12

16:30 - 18:00

TR1/S44: 5G Physical Layer IV

- Chair: Milan Zivkovic (Nokia Bell Labs, Germany)
Room: Fontaine C
- 16:30 **On the Feasibility to Overlay a Narrowband IoT Signal in IEEE 802.11**
Naveed Razaq Butt, Rocco Di Taranto and Dennis Sundman (Ericsson, Sweden); Leif R Wilhelmsson (Ericsson AB, Sweden)
- 16:48 **Power Factorization Based Hybrid Precoding Design for Millimeter Wave MIMO Transmitters Using Sub-Array Structure**
Ameni Mejri (National Engineering School of Tunis & SYS'COM Laboratory, Tunisia); Mofida Hajjaj (SUP'COM, Tunisia); Salem Hasnaoui (National School of Engineering of Tunis, Tunisia); Ridha Bouallegue (Innov'COM @ Sup'Com., Tunisia)
- 17:06 **Robust OSEMM-LQ Interference Management Technique for Ultra-Dense Heterogeneous Networks**

- 17:24 Carrson C. Fung and Shao-Heng Tai (National Chiao Tung University, Taiwan)
Enhanced Machine Learning Scheme for Energy Efficient Resource Allocation in 5G Heterogeneous Cloud Radio Access Networks
Ismail AlQerm and Basem Shihada (KAUST, Saudi Arabia)
- 17:42 **28-31 GHz Bi-directional Amplifier for 5G Wireless Repeaters**
Lin Wang and Carlos E. Saavedra (Queen's University, Canada)

TR1/S45: Channel Measurement and Modeling II

- Chair: Erika P. L. Almeida (Aalborg University & INDT - ITD, Denmark)
Room: Fontaine D
- 16:30 **Compensation of Survivorship Bias in Pathloss Modeling**
Koya Sato (The University of Electro-Communications, Japan); Kei Inage (Tokyo Metropolitan College of Industrial Technology, Japan); Takeo Fujii (The University of Electro-Communications, Japan)
- 16:48 **Frequency-Dependence of Channel Delay Spread in an Outdoor Environment**
Cheikh Diakhate (Telecom ParisTech, Université Paris-Saclay & Orange Labs, France); Jean-Marc Conrat (Orange Labs, France); Jean-Christophe Cousin and Alain Sibille (Telecom ParisTech, France)
- 17:06 **Propagation Characteristics of Massive MIMO Measurements in a UMA Scenario at 3.5 & 6 GHz with 100 & 200 MHz Bandwidth**
Zhe Zheng and Jianhua Zhang (Beijing University of Posts and Telecommunications, P.R. China); Lei Tian (Beijing University of Posts and Telecommunications & Wireless Technology Innovation Institute, P.R. China); Yawei Yu (Beijing University of Posts and Telecommunications, P.R. China); Ye Wu (Huawei Technologies, P.R. China)
- 17:24 **Radio Propagation in Open-pit Mines: a First Look at Measurements in the 2.6 GHz Band**
Erika P. L. Almeida (Aalborg University & INDT - Institute of Technology Development, Denmark); George Caldwell (Ektrum, Brazil); Ignacio Rodriguez (Aalborg Universitet, Denmark); Sergio Abreu (INDT - Institute of Technology Development, Brazil); Robson Domingos Vieira (Ektrum & Federal University of Brasilia, Brazil); Viviane S. B. Borges (FEAD - Faculdade de Estudos Administrativos de Minas Gerais, Brazil); Troels B. Sørensen and Preben Mogensen (Aalborg University, Denmark); Luis Guilherme Uzeda Garcia (Instituto Tecnológico Vale, Brazil)
- 17:42 **A Novel Probabilistic Path Loss Model for Simulating Coexistence Between 802.11 and 802.15.4 Networks in Smart Home Environments**
Amr El-Keyi and Hamza Umit Sokun (Carleton University, Canada); Tu Ngoc Nguyen, Qiubo Ye and Haiying Julie Zhu (Communications Research Centre, Canada); Halim Yanikomeroglu (Carleton University, Canada)

TR1/S46: Performance Analysis

- Chair: Rausley Adriano Amaral de Souza (INATEL, Brazil)
Room: Fontaine E
- 16:30 **Outage Probability Analysis for Alpha-Mu/Kappa-Mu and Kappa-Mu/Alpha-Mu Fading Scenarios**
Nidhi Bhargav (Queen's University Belfast, United Kingdom (Great Britain)); David Simmons (University of Oxford, United Kingdom (Great Britain)); Carlos Rafael Nogueira da Silva (State University of Campinas, Brazil); Elvio J Leonardo (State University of Maringa (UEM), Brazil); Simon Cotton (Queen's University, Belfast, United Kingdom (Great Britain)); Michel Daoud Yacoub (State University of Campinas, Brazil)
- 16:48 **The Product of Two Kappa-Mu Variates and the Kappa-Mu/Kappa-Mu Composite Fading Model**
Nidhi Bhargav (Queen's University Belfast, United Kingdom (Great Britain)); Carlos Rafael Nogueira da Silva (State University of Campinas, Brazil); Young

- Jin Chun (Queen's University, Belfast, United Kingdom (Great Britain)); Elvio J Leonardo (State University of Maringa (UEM), Brazil); Simon Cotton (Queen's University, Belfast, United Kingdom (Great Britain)); Michel Daoud Yacoub (State University of Campinas, Brazil)
- 17:06 **Performance of Compressive Sensing Based Energy Detection**
Eva Lagunas (University of Luxemburg - SnT, Luxembourg); Luca Rugini (University of Perugia, Italy)
- 17:24 **On the Generation of α - η - κ - μ Samples with Applications**
Vanessa Renno (National Institute of Telecommunications - Inatel, Brazil); Rausley Adriano Amaral de Souza (National Institute of Telecommunications (INATEL), Brazil); Michel Daoud Yacoub (State University of Campinas, Brazil)
- 17:42 **Experimental Evaluation of Universal Time-domain Windowed OFDM-based LTE Downlink System by Real-time Wave-shaping**
Keiichi Mizutani, Akihito Yoshito and Hiroto Kuriki (Kyoto University, Japan); Takeshi Matsumura (Kyoto University & National Institute of Information and Communications Technology (NICT), Japan); Hiroshi Harada (Kyoto University, Japan)

TR1/S47: Signal Processing for Wireless V

- Chair: Xavier N. Fernando (Ryerson University, Canada)
Room: Fontaine F
- 16:30 **An Investigation of the Solar Irradiance Effect on Visible Light Communications**
Mohamed Sufyan Islim (University of Edinburgh, United Kingdom (Great Britain)); Harald Haas (The University of Edinburgh, United Kingdom (Great Britain))
- 16:48 **Analytical Framework for Access Class Barring in Machine Type Communication**
Jason Lee, Jing Guo and Salman Durrani (The Australian National University, Australia)
- 17:06 **Energy Efficiency Maximization for CoMP Joint Transmission with Non-ideal Power Amplifiers**
Yuhao Zhang, Qimei Cui and Ning Wang (Beijing University of Posts and Telecommunications, P.R. China)
- 17:24 **Monolithic Silicon-on-Insulator Optical BeamSteering with Phase Locking Heterodyne Feedback**
Christopher Mekhiel and Xavier N. Fernando (Ryerson University, Canada)
- 17:42 **VACA: A High-Performance Variable-length Adaptive CRC Algorithm**
Mucong Chi (Beijing University of Posts and Telecommunication, P.R. China); Jun Liu, Dr. (Beijing University of Posts and Telecommunications, P.R. China)

TR1/S48: Optical Wireless II

- Chair: Alexis Alfredo Dowhuszko (CTTC, Spain)
Room: Fundy
- 16:30 **Relay Selection Strategy for Parallel Relayed FSO Systems**
Parul Puri (Jaypee Institute of Information Technology, India); Parul Garg (Netaji Subhas Institute of Technology, New Delhi, India)
- 16:48 **Exact Performance Analysis of DF Based Mixed Triple-Hop RF/FSO/RF Communication System**
Sanya Anees (Indian Institute of Information Technology - Guwahati, India); Manav Bhatnagar (Indian Institute of Technology Delhi, India)
- 17:06 **Relay-Assisted Handover to Overcome Blockage in Millimeter-Wave Networks**
Won-Ik Kim (Electronics and Telecommunications Research Institute, Korea); Jae-Su Song and SeungKwon Baek (ETRI, Korea)
- 17:24 **Session Adjournment**

TRACK 2: MAC AND CROSS-LAYER DESIGN

Tuesday, October 10

09:00 - 10:30

TR2/S01: D2D Communications

- Chair: Shiwen Mao (Auburn University, USA)
Room: St-Michel
- 09:00 *Adaptive D2D Resources Allocation Underlying(2-tier) Heterogeneous Cellular Networks*
Amal Algedir (University of Oklahoma, USA); Hazem Refai (Oklahoma University, USA)
- 09:18 *Dealing with Link Blockage in MmWave Networks: D2D Relaying or Multi-beam Reflection?*
Mingjie Feng and Shiwen Mao (Auburn University, USA); Tao Jiang (Huazhong University of Science and Technology, P.R. China)
- 09:36 *A Benchmark for D2D in Cellular Networks: The Importance of Information*
Yigit Özcan and Catherine Rosenberg (University of Waterloo, Canada); Fabrice M. Guillemin (Orange Labs, France)
- 09:54 *Resource Sharing for D2D Communication in Multi Small Cell Networks*
Faiza Ali (Institute of Space Technology, Islamabad, Pakistan); Sobia Jangsher (Institute of Space Technology, Pakistan); Farrukh Aziz Bhatti (Institute of Space Technology, Islamabad, Pakistan)
- 10:12 *Two-Player D2D Interference Canceling Games*
Liang Zhou and Olav Tirkkonen (Aalto University, Finland); Randall A Berry (Northwestern University, USA)

13:30 - 15:00

TR2/S02: LTE and WiFi Coexistence Techniques

- Chair: Razvan Stanica (INSA Lyon, France)
Room: Longueuil
- 13:30 *PRECISE: Power Aware Dynamic Traffic Steering in Tightly Coupled LTE Wi-Fi Networks*
Thomas Valerrian Pasca S (IIT Hyderabad, India); Himank Gupta (Indian Institute of Technology, Hyderabad, India); Bheemarjuna Reddy Tamma (IIT Hyderabad, India); Antony Franklin A (Indian Institute of Technology Hyderabad, India)
- 13:48 *QoS-Guaranteed Data Rate Allocation for Mixed Services on Licensed and Unlicensed Bands in LTE and WiFi Systems*
Yuhang Sun, Qixun Zhang, Lei Ji, Qinlong Wang and Zhiyong Feng (Beijing University of Posts and Telecommunications, P.R. China)
- 14:06 *A Stochastic-Modeling Approach to MAC Coexistence of LTE-U and WiFi*
Nazanin Rastegardoost and Bijan Jabbari (George Mason University, USA)
- 14:24 *Detecting LTE-U Duty Cycling Misbehavior for Fair Sharing with Wi-Fi in Shared Bands*
Xuhang Ying, Radha Poovendran and Sumit Roy (University of Washington, USA)
- 14:42 *An LTE-U Coexistence Scheme Based on Cognitive Channel Switching and Adaptive Muting Strategy*
Zhi qiang Wang (ChongQing University of Posts and Telecommunications, P.R. China); Md Shawkat Hosen (ChongQing University of Posts and Telecommunications, P.R. China); Sicong Zhao (ChongQing University of Posts and Telecommunications, P.R. China); Bin Shen (Chongqing University of Posts and Telecommunications (CQUPT), P.R. China)

TR2/S03: User Association and Discovery

- Chair: Derya Malak (The University of Texas at Austin, USA)
Room: St-Michel
- 13:30 *A LTE/WLAN Selection Method Based on a Novel Throughput Estimation Method*
Takayoshi Nakayama, Hiroaki Senoo and Yun Wen (Fujitsu Laboratories Ltd., Japan); Yoshiharu Tajima (Fujitsu Laboratories LTD., Japan); Dai Kimura (Fujitsu Laboratories Ltd., Japan)
- 13:48 *Dynamic User-AP Association for QoS-awareCSMA in Wireless Virtualized*

Networks

- Behnam Jamali (McGill University, Canada); Atoosa Dalili Shoaee (McGill University, Canada); Tho Le-Ngoc (McGill University, Canada)
- 14:06 *A Distributed Auction Policy for User Association in Device-to-Device Caching Networks*
Derya Malak (The University of Texas at Austin, USA); Mazin Al-Shalash (Huawei, USA); Jeffrey Andrews (The University of Texas at Austin, USA)
- 14:42 *Base Station Assisted Neighbor Discovery in Device to Device Systems*
Daoud Burghal, Arash Saber Tehrani and Andreas Molisch (University of Southern California, USA)

16:30 - 18:00

TR2/S04: Power and Energy

- Chair: Stefano Buzzi (University of Cassino and Lazio Meridionale/CNIT, Italy)
Room: Longueuil
- 16:30 *Joint Subcarrier and Power Allocation for OFDMA Based Mobile Edge Computing System*
Mengyuan Li, Shuo Yang, Zhenduo Zhang, Jinke Ren and Guanding Yu (Zhejiang University, P.R. China)
- 16:48 *Downlink Power Control in User-Centric and Cell-Free Massive MIMO Wireless Networks*
Stefano Buzzi (University of Cassino and Lazio Meridionale/CNIT, Italy); Alessio Zappone (University of Cassino and Southern Lazio, Italy)
- 17:06 *Robust Power Allocation for NOMA in Heterogeneous Vehicular Communications with Imperfect Channel Estimation*
Shengjie Guo and Xiangwei Zhou (Louisiana State University, USA)
- 17:24 *Energy Efficient Uplink Transmission for UE-to-Network Relay in Heterogeneous Networks*
Shiqing Zhang (Beijing University of Posts and Telecommunications, P.R. China); Xiaodong Xu (Beijing University of Posts and Telecommunications & Wireless Technology Innovation Institute, P.R. China); Mengying Sun and Xiaoxuan Tang (Beijing University of Posts and Telecommunications, P.R. China); Xiaofeng Tao (Beijing University of Posts and Telecommunications, P.R. China)
- 17:42 *ODMAC++: An IoT Communication Manager Based on Energy Harvesting Prediction*
Samuel Perez (Ecole Polytechnique, France); Juan Antonio Cordero (École Polytechnique, France); Marceau Coupechoux (Telecom ParisTech, France)

Wednesday, October 11

09:00 - 10:30

TR2/S05: Delay and Latency

- Chair: Junaid Ansari (Ericsson Research, Germany)
Room: Longueuil
- 09:00 *UD-MAC: Delay Tolerant Multiple Access Control Protocol for Unmanned Aerial Vehicle Networks*
Xinyi Liu, Zhiqing Wei, Zhiyong Feng and Fan Ning (Beijing University of Posts and Telecommunications, P.R. China)
- 09:18 *IEEE 802.11ax Uplink Scheduler to Minimize Delay: a Classic Problem with New Constraints*
Dmitry Bankov, Evgeny Khorov, Andre Didenko, Vyacheslav Loginov and Andrey Lyakhov (IITP RAS, Russia)
- 09:36 *Investigating the Energy-Efficiency/Delay Jitter Trade-off for VoLTE in LTE Downlink*
Karim Hammad, Abdallah Moubayed, Serguei Primak and Abdallah Shami (University of Western Ontario, Canada)
- 09:54 *LTE Evolution - Latency and Reliability Enhancements for Wireless Industrial Automation*
Ismet Aktas (Ericsson Research, Germany); Mohammad Jafari (Ericsson Research); Junaid Ansari, Torsten Dudda, Shehzad A. Ashraf and John Camilo Solano Arenas (Ericsson Research, Germany)

10:12 *Mobile-Aware Scheduling for Low Latency Backhaul over DOCSIS*
Jennifer Andreoli-Fang (CableLabs, USA); John Chapman (Cisco Systems, USA)

13:30 - 15:00

TR2/S06: Cross-Layer and WLANs

Chair: Fabio Pianese (Nokia Bell Labs, France)
Room: Longueuil
13:30 *Cross-Layer Design of an LQG Controller in Multihop TDMA-Based Wireless Networked Control Systems*
Keisuke Nakashima and Takahiro Matsuda (Osaka University, Japan); Masaaki Nagahara (The University of Kitakyushu, Japan); Tetsuya Takine (Osaka University, Japan)
13:48 *Cross-layer Design for Multihop MANETs Utility Optimization with AQM*
Ammar Alhosainy and Thomas Kunz (Carleton University, Canada)
14:06 *Augmenting Practical Cross-layer MAC Schedulers via Offline Reinforcement Learning*
Fabio Pianese (Nokia Bell Labs, France); Peter Danielsen (Nokia Bell Labs, USA)
14:24 *Token Bucket Based Traffic Shaping and Monitoring for WLAN-based Control Systems*
Kiran Mathews, Christopher Kramer and Reinhard Gotzhein (University of Kaiserslautern, Germany)
14:42 *Throughput-aware Dynamic Sensitivity Control Algorithm for Next Generation WLAN System*
Yun Wen (Fujitsu Laboratories Ltd., Japan); Hiroshi Fujita (Fujitsu laboratories limited, Japan); Dai Kimura (Fujitsu Laboratories Ltd., Japan)

16:30 - 18:00

TR2/S07: IoT and Ultra Dense Networks

Chair: Vuk Marojevic (Virginia Tech, USA)
Room: Longueuil
16:30 *Resource Allocation with CoMP Transmission in Ultra Dense Cloud-Based LTE Small Cell Networks*
Yu-Han Chen, Hsi-Lu Chao and Sau-Hsuan Wu (National Chiao Tung University, Taiwan); Chai-Hien Gan (ITRI, Taiwan)
16:48 *Spatial Reuse Model for mmWave Frequencies in Ultra-Dense Small-Cells Networks*
Mouna Hajir and Francois Gagnon (Ecole de Technologie Supérieure, Canada)
17:06 *Opportunistic-based Dynamic Interference Coordination in Dense Small Cells Deployment*
Ying Chen (Beijing University of Posts & Telecommunications, P.R. China); Zihua Yang (Beijing University of Posts and Telecommunications, P.R. China); Hongtao Zhang (Beijing University of Posts and Telecommunications & Key Lab of Universal Wireless Communications, Ministry of Education, P.R. China)
17:24 *Contention-based Uplink Small Data Transmission for Massive MTC in 5G*
Hua Chao (Nokia Shanghai Bell Co. Ltd); Yonggang Wang (Nokia Shanghai Bell Co., Ltd., P.R. China)
17:42 *Enhancing Cellular M2M Random Access with Binary Countdown Contention Resolution*
Mikhail Vilgelm and Sergio Rueda Linares (Technical University of Munich, Germany); Wolfgang Kellerer (Technical University of Munich)

Thursday, October 12

09:00 - 10:30

TR2/S08: Advanced Techniques

Chair: Allen B. Mackenzie (Virginia Tech, USA)
Room: St-Michel
09:00 *Adaptive Channel Bonding in Wireless LANs Under Demand Uncertainty*
Amr Nabil, Mohammad J. Abdel-Rahman and Allen B. MacKenzie (Virginia

Tech, USA)
09:18 *A Study on Channel Estimation Algorithm with Sounding Reference Signal for TDD Downlink Scheduling*
Jung-Yeon Baek (ETS Engineering School, University of Québec, Canada); Een-Kee Hong (Kyunghee University, Korea); Georges Kaddoum (ETS Engineering School, University of Québec, Canada)
09:36 *A CQI Feedback Clustering Technique for Signaling Traffic Reduction During Crowd Events in 3GPP LTE Systems*
Mario Cordina and Carl J. Debono (University of Malta, Malta)
09:54 *Optimum UAV Positioning for Better Coverage-Connectivity Tradeoff*
Mai A. Abdelmalek (FIU, USA); Ahmed S. Ibrahim (Florida International University, USA); Mohamed Mokhtar (Florida International University (FIU), USA)
10:12 *On the Impact of Downlink Feedback on LoRa Performance*
Marco Centenaro and Lorenzo Vangelista (University of Padova, Italy); Ryuji Kohno (Yokohama National University & University of Oulu, Japan)

13:30 - 15:00

TR2/S09: Resource Allocation I

Chair: Wissam Ajib (Université du Québec à Montréal, Canada)
Room: Longueuil
13:30 *Receiver Characteristic Aware Optimal Resource Allocation in Multi-RAT Wireless Networks*
Amr Nabil, Aditya V Padaki, Mohammad J. Abdel-Rahman, Allen B. MacKenzie and Jeffrey Reed (Virginia Tech, USA)
13:48 *Matching Game Based Resource Allocation for 5G H-CRAN Networks with Device-to-Device Communication*
XingWang Mao, Biling Zhang and Yuyang Chen (Beijing University of Posts and Telecommunications, P.R. China); Jung-Lang Yu (Fu Jen Catholic University, Taiwan); Zhu Han (University of Houston, USA)
14:06 *Graph-Based Resource Allocation with Conflict Avoidance for V2V Broadcast Communications*
Luis F. Abanto-Leon (Eindhoven University of Technology, The Netherlands); Arie Koppelaar (NXP Semiconductors, The Netherlands); Sonia Heemstra de Groot (Eindhoven Technical University, The Netherlands)
14:24 *Downlink Radio Resource Allocation with MU-MIMO and Carrier Aggregation in 5G Networks*
Mustapha Amara (France Research Center, Huawei Technologies Co., Ltd., France); Afef Feki (France Research Center, Huawei Technologies, France)
14:42 *Session Adjournment*
15:02 *On the User Association and Resource Allocation in HetNets with mmWave Base Stations*
Citrine Chaieb (High School of Communications of Tunis (SUPCOM), Tunisia); Zoubair Mlika (University of Quebec at Montreal, Canada); Fatma Abdelkefi (High School of Communications of Tunis (SUPCOM), Tunisia); Wessam Ajib (Université du Québec à Montréal, Canada)

16:30 - 18:00

TR2/S10: Resource Allocation II

Chair: Ramesh Annavajjala (Northeastern University, USA)
Room: Longueuil
16:30 *Adaptive Learning Based Directional MAC Protocol for Millimeter Wave (mmWave) Wireless Networks*
Pooja Tiwari and Dilip Meena (Dhirubhai Ambani Institute of Information and Communication Technology (DA-IICT), India); Laxminarayana Pillutla (Dhirubhai Ambani-Institute of Information and Communication Technology, India)
16:48 *Performance-Cost Trade-off of Joint Beamforming and User Clustering in Cloud Radio Access Networks*
Thang Duc Ha (University of Paris Sud, France); Lila Boukhatem (Paris-Sud&LRI/CNRS, France); Megumi Kaneko (National Institute of Informatics, Japan); Steven Martin (Paris-Sud University, France)
17:06 *An Optimal LTE-V2I-Based Cooperative Communication Scheme for Vehicular Networks*

- 17:24 Jose Angel Leon Calvo and Rudolf Mathar (RWTH Aachen University, Germany)
Game Theoretic Analysis of Sublicensing for PAL and GAA Bands in Spectrum Access System
Huiyang Wang (University of Technology Sydney & Australia, Australia); Eryk Dutkiewicz and Diep N. Nguyen (University of Technology Sydney, Australia);

TRACK 3: MOBILE AND WIRELESS NETWORKS

Tuesday, October 10

09:00 - 10:30

TR3/S01: 5G Architecture

- Chair: Witold A. Krzymien (University of Alberta, Canada)
Room: Fontaine G
09:00 **Implementation of LTE/WiFi Link Aggregation with Very Tight Coupling**
Younes Khadraoui (Institut Mines Telecom / Telecom Bretagne & IRISA, France); Xavier Lagrange (IMT Atlantique & IRISA, Université Bretagne Loire, France); Annie Gravey (Institut Mines Telecom - Telecom Bretagne & UMR CNRS 6074 IRISA, France)
09:18 **Constructing Scale-free Topologies for Low Delay of 5G**
Wei Chang, Guochu Shou, Yaqiong Liu, Zhigang Guo, Yihong Hu and Xueguang Jin (Beijing University of Posts and Telecommunications, P.R. China)
09:36 **Hybrid Optical/RF Backhauling for 5G Networks**
Mohammed Almekhlafi (Cairo University, Egypt); Ahmed S. Ibrahim (Florida International University, USA); Yasmine Fahmy (Cairo University, Egypt); Hany M. El-Sayed (Cairo University & Faculty of Engineering, Egypt); Mohamed Khairy (Elec. and Comm. Dept., Faculty of Eng., Cairo Univ, Egypt)
09:54 **Simplification as Design Principle for 5G: A Native IP Data Plane for a Lean Packet System**
Fabio Giust and Aqsa Malik (NEC Laboratories Europe, Germany); Marco Liebsch (NEC Europe Ltd, Germany)
10:12 **Association of Networked Flying Platforms with Small Cells for Network Centric 5G+ C-RAN**
Syed Awais Wahab Shah and Tamer Khattab (Qatar University, Qatar); Muhammad Zeeshan Shakir (University of the West of Scotland, United Kingdom (Great Britain)); Mazen Omar Hasna (Qatar University, Qatar)

TR3/S02: UAV-Based Communications

- Chair: Vuk Marojevic (Virginia Tech, USA)
Room: Fontaine H
09:00 **User Scheduling for Non-orthogonal Transmission in UAV-Assisted Relay Network**
Jaekuk Baek (Korea Advanced Institute of Science and Technology, Korea); Sang Ik Han (Korea Advanced Institute of Science and Technology (KAIST), Korea); Youngnam Han (KAIST, Korea)
09:18 **Waveform and Spectrum Management for Unmanned Aerial Systems Beyond 2025**
Jaber Kakar (Ruhr-Universitaet Bochum, Germany); Vuk Marojevic (Virginia Tech, USA)
09:36 **UAV Assisted Public Safety Communications with LTE-Advanced HetNets and FeCIC**
Abhaykumar Kumbhar (Florida International University & Motorola Solutions, Inc, USA); Ismail Güvenç and Simran Singh (North Carolina State University, USA)
09:54 **Performance Evaluation of the Dynamic Trajectory Design for an Unmanned Aerial Base Station in a Single Frequency Network**
Margot Deruyck (Ghent University - IMEC, Belgium); Alberto Marri and Silvia Mignardi (University of Bologna, Italy); Luc Martens (Ghent University, Belgium); Wout Joseph (Ghent University/IMEC, Belgium); Roberto Verdone (University of Bologna, Italy)
10:12 **Dynamic Centered Group Key Management for Unmanned Aerial Vehicle Networks with Multi-Beam Concurrent Transmissions**
Qian Mao (The University of Alabama, USA); Fei Hu and Ji Qi (University of Alabama, USA)

- 17:42 Markus Dominik Mueck (Intel Deutschland GmbH, Germany)
On the Performance of Massive Grant-Free NOMA
Rana Abbas (The University of Sydney, Australia); Mahyar Shirvanimoghaddam, Yonghui Li and Branka Vucetic (University of Sydney, Australia)

TR3/S03: Association/Selection in HetNets

- Chair: Oussama Damen (University of Waterloo, Canada)
Room: Jacques-Cartier
09:00 **Analysis of the Cell Association for Decoupled Wireless Access in a Two Tier Network**
Zeeshan Sattar (École De Technologie Supérieure, Canada); Joao Victor de Carvalho Evangelista (Ecole de Technologie Supérieure & Lacime, Canada); Georges Kaddoum (ETS Engineering School, University of Québec, Canada); Naïm Batani (École de Technologie Supérieure, Canada)
09:18 **Improving Efficiency of Heterogeneous Wi-Fi Networks with Joint Usage of TIM Segmentation and Restricted Access Window**
Aleksy Kureev (IITP RAS & MIPT, Russia); Dmitry Bankov, Evgeny Khorov and Andrey Lyakhov (IITP RAS, Russia)
09:36 **A Novel Load-Aware Cell Association for Simultaneous Network Capacity and User QoS Optimization in Emerging HetNets**
Ahmad Asghar, Hasan Farooq and Ali Imran (University of Oklahoma, USA)
09:54 **A Hybrid Network Selection Scheme for Heterogeneous Wireless Access Network**
Nagina Zarin (Concordia University Montreal, Canada); Anjali Agarwal (Concordia University, Canada)
10:12 **A D2D Mode Selection Scheme with Energy Consumption Minimization Underlying Two-tier Heterogeneous Cellular Networks**
Ping Chu (Beijing University of Post and Telecommunications, P.R. China); Xiaoxiang Wang (Beijing University of Posts and Telecommunications, P.R. China); Dongyu Wang (Beijing University of Posts and Telecommunications & Key Laboratory of Universal Wireless Communications, Ministry of Education, P.R. China); Lei Yu (Beijing University of Posts and Telecommunications, P.R. China)

13:30 - 15:00

TR3/S04: 5G Communication Protocols

- Chair: Kadoch Michel (ETS University of Quebec, Canada)
Room: Fontaine G
13:30 **Diversity and Network Coded 5G Fronthaul Wireless Networks for Ultra Reliable and Low Latency Communications**
Nabeel Sulieman and Eren Balevi (University of South Florida, USA); Kemal Davaslioglu (Intelligent Automation, Inc, USA); Richard D. Gitlin (University of South Florida, USA)
13:48 **r-Hint: A Message-Efficient Random Access Response for mMTC in 5G Networks**
Teng-Wei Huang, Yi Ren and Kate Ching-Ju Lin (National Chiao Tung University, Taiwan); Yu-Chee Tseng (National Chiao-Tung University, Taiwan)
14:06 **Matérn-Like Model Based Analysis for Power Control in User-Centric 5G Networks**
Ying Chen (Beijing University of Posts & Telecommunications, P.R. China); Hongtao Zhang (Beijing University of Posts and Telecommunications & Key Lab of Universal Wireless Communications, Ministry of Education, P.R. China)
14:24 **Performance Analysis of REM-Based Handover Algorithm for Multi-Tier Cellular Networks**
Cristo Suarez-Rodriguez (Macquarie University/CentraleSupélec, Australia); Beeshanga Abewardana Jayawickrama and Ying He (University of Technology Sydney, Australia); Faouzi Bader (CentraleSupélec, France); Michael Heimlich (Macquarie University, Australia)
14:42 **A Novel CS-based Non-Orthogonal Multiple Access MIMO System for Downlink of MTC in 5G**

K. HE, Y. Li and Changchuan Yin (Beijing University of Posts and Telecommunications, P.R. China)

TR3/S05: VANETS

- Chair: Georges Kaddoum (ETS Engineering School, University of Québec, Canada)
Room: Fontaine H
- 13:30 *Performance Analysis of Peer-to-Peer V2V Wireless Communications in the Presence of Interference*
Khaled Eshteivi (University of ETS, Canada); Francois Gagnon (Ecole de Technologie Supérieure, Canada); Georges Kaddoum (ETS Engineering School, University of Québec, Canada); Kais Ben Fredj (INRS-EMT, University of Quebec, Canada)
- 13:48 *A Link Transmission-Quality Based Geographic Routing in Urban VANETs*
Lei Liu and Chen Chen (Xidian University, P.R. China)
- 14:06 *Trajectory Prediction to Avoid Channel Congestion in V2I Communications*
Guillem Boquet (Universitat Autònoma de Barcelona, Spain); Jose Vicario and Alejandro Correa (Universitat Autònoma de Barcelona, Spain); Antoni Morell (Universitat Autònoma de Barcelona (UAB), Spain); Ibrahim Rashdan and Estefania Munoz Diaz (German Aerospace Center (DLR), Germany); Fabian de Ponte Müller (German Aerospace Center DLR, Germany)
- 14:24 *A Novel Task Allocation for Maximizing Reliability Considering Fault-Tolerant in VANET Real Time Systems*
Yao Xiao (Xidian University, P.R. China); Zhiyuan Ren, Hailin Zhang, Chen Chen and Chenhua Shi (Xidian University, P.R. China)
- 14:42 *A Study of the Impact of Merging Schemes on Cluster Stability in VANETs*
Mengying Ren (University of Technology of Troyes, France); Jun Zhang (Telecom ParisTech, France); Lyes Khokhi (University of Technology of Troyes, France); Houla Labiod (TELECOM ParisTech (ex: ENST), France); Véronique Vèque (University of Paris-Sud 11, France)

TR3/S06: Energy Efficient/Aware Communications

- Chair: Armen A Dzhagaryan (University of Alabama in Huntsville, USA)
Room: Pointe-aux-Trembles
- 13:30 *Efficient Data and Energy Transfer in IoT with a Mobile Cognitive Base Station*
Abdullah M. Almasoud and Ahmed E. Kamal (Iowa State University, USA)
- 13:48 *D2D-assisted Sleep Mode Strategies for Green Mobile Networks*
Antonia Maria Masucci, Salah Eddine Elayoubi and Azeddine Gati (Orange Labs, France)
- 14:06 *A Framework for Optimizing File Transfers Between Mobile Devices and the Cloud*
Armen A Dzhagaryan (University of Alabama in Huntsville, USA); Aleksandar Milenkovic (University of AL in Huntsville, USA)
- 14:24 *Analytical Approach to Base Station Sleep Mode Power Consumption and Sleep Depth*
Oluwakayode Onireti (University of Glasgow, United Kingdom (Great Britain)); Abdelrahim Mohamed (University of Surrey & Institute for Communication Systems (ICS), 5G Innovation Centre (5GIC), United Kingdom (Great Britain)); Haris Bin Pervaiz (University of Surrey & Institute for Communication Systems (ICS), Home of 5GIC, United Kingdom (Great Britain)); Muhammad Ali Imran (University of Glasgow, United Kingdom (Great Britain))
- 14:42 *Energy Efficiency Analysis for Future 3D Ultra Dense Mobile Networks with Sleep Mode*
Lei Zhang (Beijing University of Posts and Telecommunications); Xinyu Gu, Zhenyu Liu and Lin Zhang (Beijing University of Posts and Telecommunications, P.R. China)

TR3/S07: Body Area Networks

- Chair: Ali Imran (University of Oklahoma, USA)
Room: Jacques-Cartier
- 13:30 *Interference of Wireless Technologies on BLE Based WBANs in Hospital Scenarios*
Heikki Karvonen (University of Oulu, Centre for Wireless Communications, Finland); Carlos Pomalaza Ruez (Purdue University, USA); Konstantin Mikhaylov, Matti Hämäläinen and Jari Linatti (University of Oulu, Finland)
- 13:48 *Energy Efficient Advertisement Protocol for Cooperative Body Area Networks*

Luiz Henrique Suraty Filho and Mickael Maman (CEA-Leti Minatec Campus, France)

- 14:06 *mmRTI: Radio Tomographic Imaging Using Highly-Directional Millimeter-Wave Devices for Accurate and Robust Indoor Localization*
Avishek Patra and Ljiljana Simic (RWTH Aachen University, Germany); Marina Petrova (KTH Royal Institute of Technology, Sweden)
- 14:24 *Dynamic UWB Off-Body Radio Channels - Human Body Shadowing Effect*
Timo Kumpuniemi, Juha-Pekka Mäkelä and Matti Hämäläinen (University of Oulu, Finland); Kamya Yekeh Yazdandoost (University of Oulu - Centre for Wireless Communications, Finland); Jari Linatti (University of Oulu, Finland)
- 14:42 *Application of Link Adaptation in Body Area Networks*
Martina Barbi (Instituto de Telecomunicaciones y Aplicaciones Multimedia (ITEAM), Spain); Kamran Sayrafian (NIST, USA); Mehdi Alasti (AdGen Telecom Group)

16:30 - 18:00

TR3/S08: LTE Networks

- Chair: Ashraf Badawi (Zewail City of Science and Technology, Egypt)
Room: Fontaine G
- 16:30 *Combining Dynamic Clustering and Scheduling for Coordinated Multi-Point Transmission in LTE*
Sebastian Scholz (University of Stuttgart, Germany)
- 16:48 *LTE Cell Load Estimation by Radio Quality Measurement of UE Based on BS Configuration*
Takayuki Suzuki, Takahiro Nobukiyo and Takeo Onishi (NEC Corporation, Japan); Daisuke Ohta (NEC Workers' Union, Japan); Eiji Takahashi (NEC Corporation, Japan)
- 17:06 *Grant-less Uplink Transmission for LTE Operated in Unlicensed Spectrum*
Jinyu Zhang (Beijing University of Posts and Telecommunications, P.R. China); Chang Wenting (University of Tsinghua, P.R. China); Huaning Niu (Intel, USA); Salvatore Talarico (Intel Corporation, USA); Hongwen Yang (Beijing University of Posts and Telecommunications, P.R. China)
- 17:24 *Multi-objective Optimization for Balancing Energy Efficiency and Channel Capacity for Machine Type Communications in LTE Networks*
Shuai Gao (University of Beijing Jiaotong, P.R. China); Shaoyi Xu (Beijing Jiaotong University, P.R. China)
- 17:42 *Data-Driven Performance Evaluation of Carrier Aggregation in LTE-Advanced*
Norbert Ludant (IMDEA Networks Institute, Spain); Nicola Bui (Northeastern University, USA); Ana Garcia Armada (Universidad Carlos III de Madrid, Spain); Joerg Widmer (IMDEA Networks Institute, Spain)

TR3/S09: Vehicular Networks

- Chair: Salama Said Ikki (Lakehead University, Canada)
Room: Fontaine H
- 16:30 *Analysis and Modeling of Mobile Traffic Using Real Traces*
Hoang Duy Trinh (Centre Tecnològic de Telecomunicacions de Catalunya, Spain); Nicola Bui (Northeastern University, USA); Joerg Widmer (IMDEA Networks Institute, Spain); Lorenza Giupponi and Paolo Dini (Centre Tecnològic de Telecomunicacions de Catalunya (CTTC), Spain)
- 16:48 *A Distance-Based Interest Forwarding Protocol for Vehicular Information-Centric Networks*
Xiangshen Yu, Rodolfo W. L. Coutinho and Azzedine Boukerche (University of Ottawa, Canada); Antonio A.F. Loureiro (Federal University of Minas Gerais, Brazil)
- 17:06 *Delay Analysis for Drone-Based Vehicular Ad-Hoc Networks*
Hafez Seliem (Memorial University of Newfoundland, Canada); Mohamed Hossam Ahmed (Memorial University, Canada); Reza Shahidi (The University of British Columbia, Canada); Mohamed S Shehata (Memorial University of Newfoundland, Canada)
- 17:24 *Enabling Efficient Content Dissemination for Cooperative Vehicular Networks*
Tao Guo, Changle Li, Weiwei Dong, Zhifang Miao and Xiaonan Su (Xidian University, P.R. China)
- 17:42 *Efficient Messages Broadcasting Within Vehicular Safety Applications*
Khiredine Benaissa (University Of MEDEA, Algeria); Salim Bitam (University of Biskra & LESIA Laboratory, Algeria); Abdelhamid Mellouk (UPEC,

University Paris-Est Creteil Val de Marne, France)

TR3/S10: Energy Efficient WSNs

Chair: Evgeny Khorov (IITP RAS, Russia)

Room: Jacques-Cartier

- 16:30 *Impact of the Simulation Parameters on the Quantitative Results of Protocols for WSNs*
Affoua Thérèse Aby (LIMOS-CNRS, France); Marie Françoise Servajean (LIMOS, France); Michel J. Misson (Clermont Université / LIMOS CNRS, France)
- 16:48 *Asymptotically Optimal Scheduling for Energy Harvesting Wireless Sensor Networks*
Omer M Gul (Middle East Technical University, Turkey)
- 17:06 *Ultra-Narrowband for Energy-Scavenging-Powered Wireless Sensor Networks*
MHD Zaher Mahfouz, Arjan Meijerink and Mark J. Bentum (University of Twente, The Netherlands)
- 17:24 *Buffer Management Using Integrated Queueing Models for Mobile Energy Harvesting Sensors*
Sophie Zareei, Amir Hosein Afshar Sedigh and Jeremiah D. Deng (University of Otago, New Zealand); Martin Purvis (Information Science University of Otago New Zealand, New Zealand)
- 17:42 *A Mobile Two-Way Wireless Covert Timing Channel Suitable for Peer-to-Peer Malware*
Forest Mead, Jeffrey Zielinski and Lanier Watkins (Johns Hopkins University Information Security Institute, USA); William H. Robinson (Vanderbilt University, USA)

Wednesday, October 11

09:00 - 10:30

TR3/S11: Spectrum Management/Coexistence

Chair: Kadoch Michel (ETS University of Quebec, Canada)

Room: St-Michel

- 09:00 *Time-Domain Cooperative Coexistence of BLE and IEEE 802.15.4 Networks*
Onur Carhacioglu (Eindhoven University of Technology & IMEC, The Netherlands); Pouria Zand (IMEC NL imec / Holst Centre, The Netherlands); Majid Nabi (Eindhoven University of Technology & Isfahan University of Technology, The Netherlands)
- 09:18 *Dynamic Spectrum Management in Green Cognitive Radio Cellular Networks*
Lokman Sboui (King Abdullah University of Science and Technology (KAUST), Saudi Arabia); Hakim Ghazzai (Qatar Mobility Innovations Center & QMIC, Qatar); Zouheir Rezki (University of Idaho, USA); Mohamed-Slim Alouini (King Abdullah University of Science and Technology (KAUST), Saudi Arabia)
- 09:36 *Interference Monitoring Scheme Using Feature Detection Between Satellite and Cellular Systems in 28 GHz Band*
Kanshiro Kashiki and Tomoki Sada (KDDI Research Inc, Japan); Akihide Nagamine and Fumio Watanabe (Tokyo Institute of Technology, Japan) (State University of Campinas, Brazil)
- 09:54 *Ratio of Kappa-Mu Variates and Its Application in Spectrum Sharing*
Elvio J Leonardo (State University of Maringa (UEM), Brazil); Ugo Dias (University of Brasilia, Brazil); Daniel Benevides da Costa (Federal University of Ceara (UFC) & Area: Telecommunications, Brazil); Michel Daoud Yacoub (State University of Campinas, Brazil)
- 10:12 *LoRaWAN Radio Interface Analysis for North American Frequency Band Operation*
Ahmed Alsahily (University of Toronto, Canada); Adam J. Tenenbaum (TELUS, Canada); Elvino Silveira Sousa (University of Toronto, Canada); Ivo Maljevic (TELUS, Canada)

TR3/S12: Vehicle-Assisted Communications and Services

Chair: Mazen Omar Hasna (Qatar University, Qatar)

Room: Fontaine G

- 09:00 *Theoretical Analysis of Handover and Dynamic Cell Reconfiguration Through Monitored Vehicular Speed*
Hiroshi Saito (NTT & NTT Network Technology Laboratories, Japan)
- 09:18 *Optimal Transmission Range for V2I Communications on Congested Highways*
Tatsuaki Kimura (NTT, Japan); Hiroshi Saito (NTT & NTT Network Technology Laboratories, Japan); Hirotada Honda (NTT, Japan)
- 09:36 *Decentralized Traffic Rerouting Using Minimalist Communications*
Andreas Kasprzak and Beshah Ayalew (Clemson University, USA); Chad Lau (Harris Corporation, USA)
- 09:54 *A Vehicle-Assisted Offloading Scheme for Hotspot Base Stations on Metropolitan Streets*
Jianyuan Feng and Zhiyong Feng (Beijing University of Posts and Telecommunications, P.R. China)
- 10:12 *A Semi-Markov Decision Process-Based Computation Offloading Strategy in Vehicular Networks*
Zhe Wang, Zhangdai Zhong and Minming Ni (Beijing Jiaotong University, P.R. China)

TR3/S13: Routing

Chair: Tamer Khattab (Qatar University, Qatar)

Room: Fontaine H

- 09:00 *Geographic Routing with Cooperation for Reliable Paths in Device-to-Device Networks (WITHDRAWN)*
Mohamed Hegazy (Nile University & National Telecom Regulatory Authority, Egypt); Tamer ElBatt (Faculty of Engineering, Cairo University & WINC, Nile University, Egypt)
- 09:18 *Performance Evaluation of Proactive Multipath Routing Protocol for Ubiquitous Networks*
Alexandros Ladas (Kingston University, United Kingdom (Great Britain)); Nuwan S Weerasinghe (Kingston University & iScientia Limited, United Kingdom (Great Britain)); Christos Politis (Kingston University, United Kingdom (Great Britain))
- 09:36 *Routing Protocol Design in Tag-to-Tag Networks with Capability-enhanced Passive Tags*
Chang Liu (Eastern New Mexico University, USA); Zygmunt J. Haas (Cornell University & Wireless Networks Lab, USA)
- 09:54 *An Exploratory Search Strategy for Data Routing in Flying Ad Hoc Networks*
Hakim Ghazzai (Qatar Mobility Innovations Center & QMIC, Qatar); Awatef Feidi (University of Sousse, Qatar); Hamid Menouar (Qatar Mobility Innovations Center, Qatar); Mohamed Lassaad Ammari (University of Sousse, Tunisia)
- 10:12 *SORA: A Stochastic Optimal Routing Algorithm for Wireless Sensor Networks*
Xinshu Li and Jianfeng Guan (Beijing University of Posts and Telecommunications, P.R. China)

TR3/S14: Resource Allocation in HetNets

Chair: Sassan Iraj (Aalto University, Finland)

Room: Jacques-Cartier

- 09:00 *QoS-Aware Radio Resource Allocation for Ultra-dense Heterogeneous Networks*
Mary Adedoyin and Olabisi Emmanuel Falowo (University of Cape Town, South Africa)
- 09:18 *A Fair Mechanism of Virtual Radio Resource Management in Multi-RAT Wireless Het-Nets*
Behnam Rouzbehani (Instituto Superior Técnico & GROW - Group for Research on Wireless, INOV - INESC Inovação, Portugal); Luis M. Correia (IST - University of Lisbon & INESC, Portugal); Luisa Caeiro (Escola Superior de Tecnologia de Setúbal - Polytechnic Institute of Setúbal, Portugal)
- 09:36 *Optimization of Access Points Selection and Resource Allocation in Heterogeneous Wireless Network*
Iaad Ben Dhia, Mustapha Bouhtou and Taoufik En-Najjary (Orange Labs, France); Xavier Lagrange (IMT Atlantique & IRISA, Université Bretagne Loire, France); Samer Lahoud (ESIB, Saint-Joseph University of Beirut, Lebanon)
- 09:54 *Sharpe Ratio for Joint User Association and Subcarrier Allocation Design in Downlink Heterogeneous Cellular Networks*

- Nur Ilyana Anwar Apandi (Universiti Teknikal Malaysia Melaka, Malaysia);
Shuang Tian (Intel Corporation, USA); Wibowo Hardjawan (The University of
Sydney, Australia); Phee Lep Yeoh and Branka Vucetic (University of Sydney,
Australia)
- 10:12 **Joint Allocation Strategies for Radio and Processing Resources in Virtual
Radio Access Networks (V-RAN)**
Ghina Dandachi (Institut Mines-Telecom, Telecom SudParis, France); Tijani
Chahed (Telecom SudParis, France); Salah Eddine Elayoubi (Orange Labs,
France); Nada Chendeb Taher (Lebanese University, Lebanon); Ziad Fawal
(Lebanese University, Sciences 3, Lebanon)

13:30 - 15:00

TR3/S15: Next Generation Wireless Networks

- Chair: Takashi Watanabe (Osaka University, Japan)
Room: Fontaine G
- 13:30 **Core Network Function Placement in Mobile Networks**
Jad Oueis (INSA Lyon, France); Vania Conan (Thales Communications &
Security, France); Damien Lavaux (Thales, France); Razvan Stanica (INSA
Lyon, France); Fabrice Valois (Univ Lyon, INSA Lyon, Inria, CITI, France)
- 13:48 **HetCast: Cooperative Data Delivery on Cellular and Road Side Network**
Tzu-Yang Yu, Xiru Zhu, Hongji Chen and Muthucumar Maheswaran (McGill
University, Canada)
- 14:06 **Method for Detection of Airborne UEs Based on LTE Radio Measurements**
Jeroen Wigard (Nokia, Denmark); Rafhael Amorim (Aalborg University,
Denmark); Huan Cong Nguyen (Aalborg University & Faculty of Engineering
and Science, Denmark); István Z. Kovács (Nokia Bell Labs & Aalborg,
Denmark); Preben Mogensen (Aalborg University, Denmark)
- 14:24 **An Access Strategy for Downlink and Uplink Decoupling in Multi-channel
Wireless Networks**
Takumi Uekumasu (Osaka University); Makoto Kobayashi (Osaka University
& Reserach Fellow of Japan Society for the Promotion of Science (DC),
Japan); Shunsuke Saruwatari and Takashi Watanabe (Osaka University,
Japan)
- 14:42 **Dynamic IP Tunneling for Next Generation Mobile Networks**
Bong Ho Kim (Nokia Bell Labs, USA); Doru Calin (Nokia, USA); Jonathan Ling
(Alcatel-Lucent, USA); Harish Viswanathan (Nokia Bell Labs, USA)

TR3/S16: Self-Organized Networks

- Chair: Ali Imran (University of Oklahoma, USA)
Room: Fontaine H
- 13:30 **Cognitive Management of Self - Organized Radio Networks Based on Multi
Armed Bandit**
Tony Daher (Telecom ParisTech & Orange Labs, France); Sana Ben Jemaa
(Orange Labs, France); Laurent Decreusefond (Telecom ParisTech & LTCl,
France)
- 13:48 **Self-Optimized Admission Control for Multi-tenant Radio Access Networks**
Jordi Pérez-Romero (Universitat Politècnica de Catalunya (UPC), Spain);
Oriol Sallent, Ramon Ferrús and Ramon Agustí (Universitat Politècnica de
Catalunya, Spain)
- 14:06 **Experimental Results for Artificial Intelligence-based Self-Organized 5G
Networks**
Wei Jiang (German Research Center for Artificial Intelligence (DFKI GmbH)
& Technical University (TU) of Kaiserslautern, Germany); Mathias Strufe
(DFKI GmbH, Germany); Hans D. Schotten (University of Kaiserslautern,
Germany)
- 14:24 **Adaptive Full Duplex Communications in Cognitive Radio Networks**
Vahid Towhidlou (King's College London, United Kingdom (Great Britain));
Mohammad Shikh-Bahaei (Kings college London, United Kingdom (Great
Britain))
- 14:42 **Resource Partitioning for Millimeter-wave Inband Self-Xhaul Networks**
Seungkwon Cho (Electronics and Telecommunication Research Institute,
Korea); Seungkwon Baek (ETRI, Korea)

TR3/S17: Scheduling/Admission Control

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

- Room: Pointe-aux-Trembles
- 13:30 **CD-ASM: A New Queuing Paradigm to Overcome Bufferbloat Effects in
HetNets**
Benevid Felix (UFPR, Brazil); Aldri Santos (Federal University of Parana
(UFPR), Brazil); Burak Kantarci (University of Ottawa, Canada); Michele
Nogueira (Federal University of Parana (UFPR), Brazil)
- 13:48 **Longest-Queue-First Scheduling with Intermittent Sampling**
Saied Mehdian, Zhengyuan Zhou and Nicholas Bambos (Stanford University,
USA)
- 14:06 **Scheduling Wireless Ad Hoc Networks in Polynomial Time Using Claw-free
Conflict Graphs**
Alper Kose (EPFL, Turkey); Muriel Médard (MIT, USA)
- 14:24 **Admission Control and Load Management in Underlay OFDMA Cognitive
Radio Networks**
Fahime Khoramnejad (Amir Kabir University of Technology, Iran); Mehdi
Rasti (Amirkabir University of Technology, Iran); Hosein Pedram (, Iran);
Shahrokh Valaee (University of Toronto, Canada)
- 14:42 **Admission Control and Power Allocation in Wireless Power Charging
Networks**
Ali Bayat and Sonia Aissa (INRS, University of Quebec, Canada)

16:30 - 18:00

TR3/S18: Content/Caching Aware Cellular Networks

- Chair: Shahin Vakilinia (Synchronmedia & Synchronmedia, Canada)
Room: Fontaine G
- 16:30 **On the Analysis of Human Mobility Model for Content Broadcasting in 5G
Networks**
Chun Pong Lau (KAUST, Saudi Arabia); Abdulrahman Alabbasi (KTH Royal
Institute of Technology, Sweden); Basem Shihada (KAUST, Saudi Arabia)
- 16:48 **Service Load Balancing in Fog-based 5G Radio Access Networks**
Jofina Jijin, Boon-Chong Seet, Peter Han Joo Chong and Hazim Jarrah
(Auckland University of Technology, New Zealand)
- 17:06 **Popularity Based File Categorization and Coded Caching in 5G Networks**
Mohsen Karimzadeh Kiskani (University of California Santa Cruz, USA);
Shahin Vakilinia (Synchronmedia & Synchronmedia, Canada);
Mohamed Cheriet (Ecole de technologie superieure (University of Quebec),
Canada)
- 17:24 **Efficient Traffic Offloading for Seamless Connectivity in 5G Networks
Onboard High Speed Trains**
Leila Jalili (K N Toosi University of Technology, Sweden); Ali Parichehreh,
Stefan Alfredsson, Johan Garcia and Anna Brunstrom (Karlstad University,
Sweden)
- 17:42 **Mobility Aware Caching Incentive Scheme for D2D Cellular Networks**
Danyang Wang (Beijing University of Posts and Telecommunications, P.R.
China); Hailing Li (Institute of Electrical Engineering, Chinese Academy of
Science, P.R. China); Shuo Wang (Beijing University of Posts and
Telecommunications, P.R. China); Juwo Yang (Beijing University of Posts and
Telecommunications (BUPT), P.R. China); Xinwei Liu and Xing Zhang (Beijing
University of Posts and Telecommunications, P.R. China)

TR3/S19: Software Defined Networking

- Chair: Ramiro Liscano (University of Ontario Institute of Technology, Canada)
Room: Fontaine H
- 16:30 **Implementation of Multipath Network Virtualization Scheme with SDN and
NFV**
Qinglian Wang, Junli Xue, Guochu Shou, Yaqiong Liu, Yihong Hu and Zhigang
Guo (Beijing University of Posts and Telecommunications, P.R. China)
- 16:48 **Dynamic Resource Allocation for MC-NOMA VWNs with Imperfect SIC**
Daniel Tweed (McGill University, Canada); Saeedeh Parsaeefard (Iran
Telecommunications Research Center, Iran); Mahsa Derakhshani
(Loughborough University, United Kingdom (Great Britain)); Tho Le-Ngoc
(McGill University, Canada)
- 17:06 **Hierarchical Network Abstraction for HetNet Coordination**
Sergio Lembo, Junquan Deng, Ragnar Freij-Hollanti and Olav Tirkkonen

(Aalto University, Finland); Tao Chen (VTT Technical Research Centre of Finland LTD, Finland)

17:24 **A Load Balancing Scheme for Supporting Safety Applications in Heterogeneous Software Defined LTE-V Networks**

Gao YangShui and Tao Luo (Beijing University of Posts and Telecommunications, P.R. China)

17:42 **Minimizing Transmission Cost for Multiple Service Function Chainings in SDN/NFV Networks**

Faqlang Liu, Xin Chen and Wei An (Institute of Information Engineering, Chinese Academy of Sciences, P.R. China); Yong Peng (Beijing University of Posts and Telecommunications, P.R. China); Jiuyue Cao and Yan Zhang (Institute of Information Engineering, Chinese Academy of Sciences, P.R. China)

TR3/S20: Relay Networks

Chair: Hossein Pishro-Nik (University of Massachusetts, Amherst, USA)

Room: Jacques-Cartier

16:30 **Performance Analysis of Random Linear Network Coding with Relay Selection**

Jinsol Park (Korea Advanced Institute of Science and Technology, Korea); Daehee Park (KAIST, Korea); Dong-Ho Cho (Korea Advanced Institute of Science and Technology, Korea)

16:48 **Throughput Enhancement Using D2D Based Relay-Assisted Communication in Cellular Networks**

Pradip Kumar Barik (Indian Institute of Technology, Kharagpur, India); Chetna Singhal (Indian Institute of Technology Kharagpur, India); Raja Datta (Indian Institute of Technology, Kharagpur, India)

17:06 **Relay Selection in FDD Amplify-and-Forward Cooperative Networks**

Ala Gouissem, Lutfi Samara and Ridha Hamila (Qatar University, Qatar); Naofal Al-Dhahir (University of Texas at Dallas, USA); Sebti Foufou (Qatar University, Qatar)

17:24 **Least Action Routing: Identifying the Optimal Path in a Wireless Relay Network**

Aris L. Moustakas (University of Athens, Greece); Panayotis Mertikopoulos (French National Center for Scientific Research (CNRS) & Laboratoire d'Informatique de Grenoble, France); Zhengyuan Zhou and Nicholas Bambos (Stanford University, USA)

17:42 **Relay Selection for mmWAVE Communications**

Sungoh Kwon (University of Ulsan, Korea); Joerg Widmer (IMDEA Networks Institute, Spain)

Thursday, October 12

09:00 - 10:30

TR3/S21: Evaluation of Communications Protocols

Chair: Marie Françoise Servajean (LIMOS, France)

Room: Fontaine G

09:00 **Evaluation of Multicast Efficiency in Random Clustered Networks Under Antenna Selection Combining**

Mohammad Ghadir Khoshkholgh Dashtaki (University of British Columbia, Canada); Ali Asghar Haghighi (University of Ontario Institute of Technology & McGill University, Canada); Victor C.M. Leung (University of British Columbia, Canada)

09:18 **Faster MPTCP Sub-flow Establishment for Interactive Applications**

Péter Szilágyi (Nokia Bell Labs, Hungary)

09:36 **The Impact of Duration and Settings of TCP Measurements on Available Bandwidth Estimation in Mobile Networks**

Samira Homayouni and Vaclav Raida (Vienna University of Technology, Austria); Philipp Svoboda (Technische Universität Wien, Austria); Markus Rupp (TU Wien, Austria)

09:54 **An Analysis of the Collection Tree Protocol (CTP) in Mobile Sensing Environments**

Nadra Otman (UOIT, Canada); Ramiro Liscano and Shahram Shah Heydari (University of Ontario Institute of Technology, Canada)

10:12 **Simulation of IEEE 1902.1 (RuBee) Protocol for Communication with Buried**

Assets

Stefano Dantas and Adoniran Judson Braga (Universidade de Brasília, Brazil); Andre Noll Barreto (Ektrum / Universidade de Brasília, Brazil); Leonardo Aguayo (University of Brasília, Brazil); Lucas Silva (Universidade de Brasília, Brazil); Luis Guilherme Uzeda Garcia (Instituto Tecnológico Vale, Brazil)

TR3/S22: Learning Algorithms in Networks

Chair: Hakim Ghazzai (Qatar Mobility Innovations Center & QMIC, Qatar)

Room: Fontaine H

09:00 **Implications of Decentralized Q-Learning Resource Allocation in Wireless Networks**

Francesc Wilhelmi (Pompeu Fabra University, Spain); Cristina Cano (Universitat Oberta de Catalunya, Spain); Boris Bellalta (Universitat Pompeu Fabra, Spain); Anders Jonsson (Pompeu Fabra University, Spain)

09:18 **Learning Optimal Routing for the Uplink in LPWANs Using Similarity-enhanced Epsilon-greedy**

Sergio Barrachina-Muñoz and Boris Bellalta (Universitat Pompeu Fabra, Spain)

09:36 **Artificial Neural Network Based Hybrid Spectrum Sensing Scheme for Cognitive Radio**

Maunil Vyas (Ahmedabad University, India); D K Patel (School of Engineering and Applied Science-Ahmedabad University, India); Miguel López-Benítez (University of Liverpool, United Kingdom (Great Britain))

09:54 **Computation Offloading for Mobile Edge Computing: A Deep Learning Approach**

Shuai Yu and Xin Wang (UPMC - Sorbonne Université, France); Rami Langar (University Paris Est Marne-la-Vallée, France)

10:12 **Genetic Algorithms for Lifetime Elongation of Clustered WSN**

Aya Taha (Zewail City of Science and Technology, Egypt); Samy S. Soliman (Cairo University & Zewail City of Science and Technology, Egypt); Ashraf Badawi (Zewail City of Science and Technology, Egypt)

TR3/S23: Power Management/Awareness

Chair: Ramiro Liscano (University of Ontario Institute of Technology, Canada)

Room: Jacques-Cartier

09:00 **Use of Two-Mode Circuitry and Optimal Energy-Efficient Power Control Under Target Delay-Outage Constraints**

Jinkun Xu, Yu Chen, Hao Chen, Qimei Cui and Xiaofeng Tao (Beijing University of Posts and Telecommunications, P.R. China)

09:18 **ETP Algorithm: Increasing Spatial Reuse in Wireless LANs Dense Environment Using ETX**

Tanguy Ropitault and Nada Golmie (NIST, USA)

09:36 **Energy Efficiency of Hybrid Unicast-Broadcast Networks for Mobile TV Services**

Pape Abdoulaye Fam (IRT b-com & TDF, France); Matthieu Crussière (IETR - Electronics and Telecommunications Research Institute of Rennes (IETR) & INSA - National Institute of Applied Sciences, France); Stephane Paquelet (Mitsubishi Electric, France); Jean-François Héland (IETR, France); Pierre Bretilon (TDF, France)

09:54 **Optimal Uplink and Downlink Resource Allocation for Wireless Powered Cellular Networks**

Belal ElDiwany and Amr El-Sherif (Nile University, Egypt); Tamer ElBatt (Faculty of Engineering, Cairo University & WINC, Nile University, Egypt)

10:12 **Coverage-constrained Base Station Deployment and Power Allocation for Operational Cost Minimization**

Ganesh Prasad (NIT Silchar, India); Deepak Mishra (Linköping University & Indian Institute of Technology Delhi, India); Ashraf Hossain (National Institute of Technology Silchar, India)

TR3/S24: Security, Privacy, and Secrecy

Chair: Sassan Iraj (Aalto University, Finland)

Room: Pointe-aux-Trembles

09:00 **Robust Secrecy Competition in Wireless Networks**

Xiao Tang, Pinyi Ren, Datong Xu and Dongyang Xu (Xi'an Jiaotong University, P.R. China)

- 09:18 *Dependent Interferer Arrangement for Physical Layer Security: Secrecy Outage Probability in Clustered Wireless Networks*
Motoki Iwata, Koji Yamamoto, Takayuki Nishio and Masahiro Morikura (Kyoto University, Japan)
- 09:36 *Towards Scalable and Privacy Preserving Commercial Content Dissemination in Social Wireless Networks*
Faezeh Hajiaghajani and Subir Biswas (Michigan State University, USA)
- 09:54 *Secrecy Analysis of Random Wireless Networks with Multiple Eavesdroppers*
Satyanarayana Vuppala (University of Luxembourg, Luxembourg); Symeon Chatzinotas (University of Luxembourg, Luxembourg); Björn Ottersten (University of Luxembourg, Luxembourg)
- 10:12 *Session Adjournment*

13:30 - 15:00**TR3/S25: M2M, D2D, and MANETs**

- Chair: Thi Mai Trang Nguyen (UPMC Sorbonne Universités & LIP6, France)
Room: Fontaine G
- 13:30 *Charging-Aware Mobility Modeling for Wirelessly Chargeable Intermittently Connected MANETs*
Wanxin Gao and Janelle Harms (University of Alberta, Canada)
- 13:48 *Downlink Coverage and Average Cell Load of M2M and H2H in Ultra-Dense Networks*
Mahmoud I Kamel, Walaa Hamouda and Amr Youssef (Concordia University, Canada)
- 14:06 *Optimal Resource Allocation for Content Delivery in D2D Communications*
Can Guven (Bogazici University, Turkey); Suzan Bayhan (Technische Universität Berlin, Germany); Gurkan Gur and Salim Eryigit (Bogazici University, Turkey)
- 14:24 *Fair Airtime Allocation for Content Dissemination in WiFi-Direct-Based Mobile Social Networks*
Zhifei Mao and Yuming Jiang (Norwegian University of Science and Technology (NTNU), Norway)
- 14:42 *A Multilayer Link Quality Estimator for Reliable Machine-to-Machine Communication*
Wendley Souza da Silva (Federal University of Ceará & Federal University of Minas Gerais, Brazil); Daniel Fernandes Macedo (Federal University of Minas Gerais, Brazil); Michele Nogueira (Federal University of Paraná (UFPR), Brazil); Thi Mai Trang Nguyen (UPMC Sorbonne Universités & LIP6, France); Jose Nogueira (Universidade Federal de Minas Gerais, Brazil)

TR3/S26: Data Sensing, Aggregation, and Diffusion

- Chair: Li Li (Communication Research Centre of Canada, Canada)
Room: Fontaine H
- 13:30 *Opportunistic Alert Diffusion in Disaster Scenario - Stay Alive Longer !*
Farouk Mezghani (INRIA Lille - Nord Europe, France); Nathalie Mitton (Inria Lille - Nord Europe, France)
- 13:48 *Wireless Sensor Networks Localization with Outliers and Structured Missing Data*
Marco Patane' (University of Udine, Italy); Beatrice Rossi (STM, Italy); Pasqualina Fragneto (ST Microelectronics, Italy); Andrea Fusiello (University of Udine, Italy)
- 14:06 *Routing Aware Space-Time Compressive Sensing for Wireless Sensor Networks*
Manel Kortas (University of Tunis El Manar & University of Limoges, Tunisia); Vahid Meghdadi (University of Limoges, France); Ammar Bouallegue (National School of Engineers of Tunis, Tunisia); Tahar Ezzedine (National Engineering School of Tunis (ENIT), Tunisia); Oussama Habachi (XLIM, France); Jean Pierre Cances (University of Limoges, France)
- 14:24 *Cooperative Sensing Delay Minimization in Cloud-Assisted DSA Networks*
Shree Krishna Sharma (University of Western Ontario, Canada); Xianbin Wang (Western University, Canada)
- 14:42 *Event-driven Data Aggregation and Reporting for CRSN-based Substation Monitoring*
Aroua Sabrine (University of la Rochelle & ENSI, France); Inès El Korbi (University of Manouba, Tunisia); Yacine Ghamri-Doudane (University of

la Rochelle, France); Leila Azzouz Saidane (Lab CRISTAL- ENSI, University Manouba, Tunisia)

TR3/S27: Interference/Collision Aware Communications

- Chair: Ayman Sabbah (Carleton University, Canada)
Room: Pointe-aux-Trembles
- 13:30 *Evaluation of Local Transmission Delay of MIMO-ZFBB Multiplexing Receivers Under Correlated Interference*
Mohammad Ghadir Khoshkholgh Dashtaki and Victor C.M. Leung (University of British Columbia, Canada)
- 13:48 *Multicell Interference Coordination Strategy Based on Hybrid Channel Information*
Jinyi Huang, Liang Sun, Chenyang Yang and Shengqian Han (Beihang University, P.R. China)
- 14:06 *Methods for Muting Configuration Optimization*
Ole Grøndalen and Kashif Mahmood (Telenor, Norway); Olav Norvald Østerbø (Telenor Corporate Development, Norway)
- 14:24 *Renewal-Theoretic Packet Collision Modeling Under Long-Tailed Heterogeneous Traffic*
Aamir Mahmood (Mid Sweden University, Sweden); Mikael Gidlund (Mid Sweden University & ABB Corporate Research, Sweden)
- 14:42 *Gaussian Random Field Approximation for Exclusion Zones in Cognitive Radio Networks*
Zheng Wang and Brian Mark (George Mason University, USA)

16:30 - 18:00**TR3/S28: Satellite, mm-Wave, and LiFi Communications**

- Chair: Slim Zaidi (University of Quebec, INRS-EMT, Canada)
Room: Fontaine G
- 16:30 *Coverage Ratio Optimization for HAP Communications*
Dingjie Xu and Xinghui Yi (Shanghai Jiao Tong University, P.R. China); Zhihang Chen (Tan Kah Kee College, P.R. China); Cheng Li (Shanghai Jiao Tong University, P.R. China); Chaoxian Zhang (Tan Kah Kee College, P.R. China); Bin Xia (Shanghai Jiao Tong University, P.R. China)
- 16:48 *Millimeter Wave Network Coverage with Stochastic User Orientation*
Mehdi Naderi soorki (Virginia Tech, Iran); Allen B. MacKenzie and Walid Saad (Virginia Tech, USA)
- 17:06 *Modelling for Data Acquisition, Storage and Transmission of EOS*
Yan Zhu, Min Sheng, Jiandong Li and Runzi Liu (Xidian University, P.R. China); Jianping Liu (Xi'an Satellite Control Centre, P.R. China)
- 17:24 *Assessment of Multicarrier Waveforms for 5G Satellite*
Nicolas Cassiau and Baptiste Chamailard (CEA-Leti Minattec Campus, France)
- 17:42 *On Throughput Maximization Based on Optimal Update Interval in LiFi Networks*
Mohammad Dehghani Soltani and Majid Safari (University of Edinburgh, United Kingdom (Great Britain)); Harald Haas (The University of Edinburgh, United Kingdom (Great Britain))

TR3/S29: Networks and Computing

- Chair: Toktam Mahmoodi (King's College London, United Kingdom (Great Britain))
Room: Fontaine H
- 16:30 *Joint Transmission Scheme for Two Multicast Groups Based on NOMA*
Yufang Zhang and Xiaoxiang Wang (Beijing University of Posts and Telecommunications, P.R. China); Dongyu Wang (Beijing University of Posts and Telecommunications & Key Laboratory of Universal Wireless Communications, Ministry of Education, P.R. China); Qiang Zhao (Equipment Academy, P.R. China); Yibo Zhang (Beijing University of Posts and Telecommunications, P.R. China)
- 16:48 *Multi-Objective Resource Allocation for Mobile Edge Computing Systems*
Xinyi Zhang (The Hong Kong University of Science and Technology, Hong Kong); Yuyi Mao (Hong Kong University of Science and Technology, Hong Kong); Jun Zhang and Khaled B. Letaief (The Hong Kong University of Science and Technology, Hong Kong)
- 17:06 *High-Efficiency Matching Mechanism for Off-Chip Tables in OpenFlow-*

enabled Legacy Switch

Jheng-Jyun Wang, Chi-Hsiang Hung, Li-Chun Wang and Kuochen Wang (National Chiao Tung University, Taiwan); Chain-Wu Lee (Inventec Corporation, Taiwan)

17:24

Driver's Blink Detection Using Doppler Sensor

Kohei Yamamoto, Kentaroh Toyoda and Tomoaki Ohtsuki (Keio University, Japan)

17:42

Session Adjournment

TRACK 4: SERVICES, APPLICATIONS AND BUSINESS

Tuesday, October 10

09:00 - 10:30

TR4/S01: Security and Privacy for IoT

Chair: Bheemarjuna Reddy Tamma (IIT Hyderabad, India)

Room: Pointe-aux-Trembles

09:00 *Lightweight Security Protocols for the Internet of Things*

Xin-Wen Wu (Griffith University, Australia); En-hui Yang (University of Waterloo, Canada); Junhu Wang (Griffith University, Australia)

09:18 *Wearable Device User Authentication Using Physiological and Behavioral Metrics*

Sudip Vhaduri and Christian Poellabauer (University of Notre Dame, USA)

09:36 *Authentication for the Web of Things: Secure End-to-End Authentication Between CoAP and HTTP*

Marian Buschsieweke (Otto-von-Guericke University Magdeburg, Germany); Mesut Günes (Otto von Guericke University Magdeburg, Germany)

09:54 *A Semi-Outsourcing Secure Data Privacy Scheme for IoT Data Transmission*

Xiaoshuai Zhang, Stefan Poslad and Zixiang Ma (Queen Mary University of London, United Kingdom (Great Britain))

10:12 *A First Empirical Look on Internet-scale Exploitations of IoT Devices*

Mario Galluscio, Nataliia Neshenko, Elias Bou-Harb and Yongliang Huang (Cyber Threat Intelligence Laboratory, Florida Atlantic University, USA); Nasir Ghani (University of South Florida, USA); Jorge Crichigno (University of South Carolina, USA); Georges Kaddoum (ETS Engineering School, University of Québec, Canada)

TR4/S02: Content Caching and Delivery

Chair: Dong-Ho Cho (Korea Advanced Institute of Science and Technology, Korea)

Room: St-Pierre

09:00 *Incentive Based Cooperative Content Caching in Social Wireless Networks*

Rui Wang, Faezeh Hajiaghajani and Subir Biswas (Michigan State University, USA)

09:18 *Content Caching in Energy Harvesting Powered Small Cell Network*

Fengxian Guo, Heli Zhang, Xi Li and Hong Ji (Beijing University of Posts and Telecommunications, P.R. China)

09:36 *Caching and Bandwidth Allocation Policy Optimization in Heterogeneous Networks*

Jiajun Wu (Beijing University of Aeronautics and Astronautics, P.R. China); Bingqiang Chen and Chenyang Yang (Beihang University, P.R. China); Qi Li (Samsung Electronics, P.R. China)

09:54 *Dynamic Popularity Driven Caching Optimization at Base Station*

Kaiqiang Qi, Shengqian Han and Chenyang Yang (Beihang University, P.R. China)

10:12 *MAPCaching: A Novel Mobility Aware Proactive Caching over C-RAN*

Jianmei Dai and Danpu Liu (Beijing University of Posts and Telecommunications, P.R. China)

13:30 - 15:00

TR4/S03: Secure Network and Service Access

Chair: Elias Bou-Harb (Cyber Threat Intelligence Laboratory, Florida Atlantic University, USA)

Room: St-Pierre

13:30 *Drone Privacy Shield: A Wifi Based Defense*

Andy Sun, Wei Gong, Ryan Shea and Jiangchuan Liu (Simon Fraser University, Canada); Xue Liu and Qinglong Wang (McGill University, Canada)

13:48 *Integrating Blockchain for Data Sharing and Collaboration in Mobile Healthcare Applications*

Xueping Liang (Institute of Information Engineering, P.R. China); Juan Zhao (Vanderbilt University, USA); Sachin Shetty (Old Dominion University, USA); Jihong Liu (Institute of Information Engineering, Chinese Academy of Sciences, P.R. China); Danyi Li (Institute of Information Engineering, P.R. China)

14:06

Design of Privacy-preserving Mobile Bitcoin Client Based on γ -Deniability Enabled Bloom Filter

Kota Kanemura, Kentaroh Toyoda and Tomoaki Ohtsuki (Keio University, Japan)

14:24

SIMON 32/64 and 64/128 Block Cipher: Study of Cross-Correlation and Linear Span Attack Immunity

Ahmad Sghaier Omar (University of Waterloo, Canada); Otman Basir (University of Waterloo, Canada)

14:42

WiFi Fingerprint Releasing for Indoor Localization Based on Differential Privacy

Yujia Zhu (Institute of Information Engineering, Chinese Academy of Sciences, P.R. China); Yu Wang (National Computer Network Emergency Response and Coordination Center, P.R. China); Qingyun Liu and Yang Liu (Institute of Information Engineering, Chinese Academy of Sciences, P.R. China)

16:30 - 18:00

TR4/S04: Cloud and Fog Computing

Chair: En-hui Yang (University of Waterloo, Canada)

Room: Pointe-aux-Trembles

16:30 *An Efficient Database Management for Cloud-based Indoor Positioning Using Wi-Fi Fingerprinting*

Seyyed Mahmood Jafari Sadeghi, Shervin Shahidi and Shahrokh Valaee (University of Toronto, Canada)

16:48

A Cloud-based Spectrum Environment Awareness System

Li Li (Communication Research Centre of Canada, Canada); Daniel Boudreau, Richard Paiement, Isabelle Labbe, François Patenaude, Pascal Chahine, Pierre Brouillette and Maoyu Wang (Communications Research Centre Canada, Canada)

17:06

A Fog Computing Approach for Localization in WSN

Kriti Bhargava (Telecommunications Software & Systems Group, Waterford Institute of Technology, Ireland); Stepan Ivanov (Waterford Institute of Technology & TSSG, Ireland)

17:24

Controlling Cloud Data Access Privilege: Cryptanalysis and Security Enhancement

Yaser Baseri and Abdelhakim Hafid (University of Montreal, Canada); Mohammed Amine Togou (University of Montreal); Soumaya Cherkaoui (Université de Sherbrooke, Canada)

17:42

The Same, Only Different: Contrasting Mobile Operator Behavior from CrowdSourced Dataset

Konstantinos Kousias, Cise Midoglu, Ozgu Alay and Andra Lutu (Simula Research Laboratory, Norway); Antonios Argyriou (University of Thessaly, Greece); Michael Alexander Riegler (Simula Research Laboratory, Norway)

Wednesday, October 11

09:00 - 10:30

TR4/S05: Smart Homes, Factories, and Cities

Chair: Duc A. Tran (University of Massachusetts Boston, USA)

Room: Pointe-aux-Trembles

09:00 *An Autonomous System for High-Resolution Mapping of Indoor Wireless Coverage*

Rachel Wakim (University of Massachusetts Lowell, USA); Jay A Weitzen

- 09:18 (University of Massachusetts Lowell & Airvana, USA)
Optimised Electric Vehicles Charging Scheme with Uncertain User-Behaviours in Smart Grids
Chao Liu, Kok Keong Chai, Eng Tseng Lau, Yanru Wang and Yue Chen (Queen Mary University of London, United Kingdom (Great Britain))
- 09:36 *Assisted Link Prediction (ALP) Protocol in Robotic Communications*
Sipra Behera, Hemant Kumar Rath, Jyotirmoy Karjee and Anantha Simha (Tata Consultancy Services, India)
- 09:54 *Managing a Cluster of IoT Brokers in Support of Smart City Applications*
Shadha Tabatabai, Ihab Mohammed and Ala Al-Fuqaha (Western Michigan University, USA); Mohammad Ali Salahuddin (University of Waterloo, Canada)
- 10:12 *A Novel V2V Assisted Platooning System: Control Scheme and MAC Layer Designs*
Congchi Zhang and Yunpeng Zang (Ericsson, Germany); Jose Angel Leon Calvo and Rudolf Mathar (RWTH Aachen University, Germany)

TR4/S06: 5G Network Management

- Chair: Yu-Chee Tseng (National Chiao-Tung University, Taiwan)
Room: St-Pierre
- 09:00 *Protocol Conversion and Weighted Resource Allocation in Virtual Small Cells of 5G Ultra Dense Networks for Cost-Effective Service Provisioning*
Xiaoyu Duan and Yanan Liu (Western University, Canada); Akram Bin Sediq and Gary Boudreau (Ericsson, Canada); Xianbin Wang (Western University, Canada)
- 09:18 *Computation Collaboration in Ultra Dense Network Integrated with Mobile Edge Computing*
Teng Yang, Heli Zhang, Hong Ji and Xi Li (Beijing University of Posts and Telecommunications, P.R. China)
- 09:36 *Sojourn Time Estimation-Based Small Cell Selection in Ultra-Dense Networks*
Bangxu Li (Beijing University of Posts & Telecommunications, P.R. China); Hongtao Zhang (Beijing University of Posts and Telecommunications & Key Lab of Universal Wireless Communications, Ministry of Education, P.R. China); Peng Hao and Jian Li (ZTE Corporation, P.R. China)
- 09:54 *On the Integration of LoRaWAN with the 5G Test Network*
Rumana Yasmin, Juha Petäjäjärvi, Ari Pouttu and Konstantin Mikhaylov (University of Oulu, Finland)
- 10:12 *On the Performance of Network-Assisted Indoor Device-to-Device Communication Using Location Awareness and Realistic Path Loss Models*
Mansi Peer (Indraprastha Institute of Information Technology, India); Vivek A Bohara (Indraprastha Institute of Information Technology, Delhi (IIIT-Delhi), India); Anand Srivastava (Indraprastha Institute of Information Technology Delhi, India)

13:30 - 15:00

TR4/S07: Location-based Services and Applications

- Chair: Yu-Jia Chen (National Chiao Tung University, Taiwan)
Room: St-Pierre
- 13:30 *NSIM: A Robust Method to Discover Similar Trajectories on Cellular Network Location Data*
Yupeng Tuo (Institute of Information Engineering, Chinese Academy of Sciences, P.R. China); Xiaochun Yun (CNCERT/CC, P.R. China); Yongzheng Zhang (Institute of Information Engineering, Chinese Academy of Sciences, P.R. China)
- 13:48 *ResLoc: Deep Residual Sharing Learning for Indoor Localization with CSI Tensors*
Xuyu Wang, Xiangyu Wang and Shiwen Mao (Auburn University, USA)
- 14:06 *MSTM: A Novel Map Matching Approach for Low-sampling-rate Trajectories*
Yupeng Tuo (Institute of Information Engineering, Chinese Academy of Sciences, P.R. China); Xiaochun Yun (CNCERT/CC, P.R. China); Yongzheng Zhang (Institute of Information Engineering, Chinese Academy of Sciences, P.R. China)
- 14:24 *An Analytic Solution for Computing RSTD Uncertainty in Generating Assistance Data for OTDOA Positioning*

- Yinyan Wang (Nokia Bell-Labs & Nokia, USA); Rob Saxon (Nokia, USA); George Lu (Nokia, P.R. China)
- 14:42 *BlueID: Enabling Robust In-car Localization and On-demand Personalization Using Bluetooth*
Pei Huang and Pei Zheng (Samsung Electronics America, USA)

16:30 - 18:00

TR4/S08: Localization and Positioning

- Chair: Ioanis Nikolaidis (University of Alberta, Canada)
Room: Pointe-aux-Trembles
- 16:30 *RSSI Quantization for Indoor Localization Services*
Wanxin Gao, Ioanis Nikolaidis and Janelle Harms (University of Alberta, Canada)
- 16:48 *Inter-Network Cooperative Localization in Heterogeneous Networks with Unknown Transmit Power*
Saliha Büyükcöçak and Gunes Karabulut Kurt (Istanbul Technical University, Turkey); Abbas Yongacoglu (University of Ottawa, Canada)
- 17:06 *Kalman Filter-Based Localization for Internet of Things LoRaWAN End Points*
Wafae Bakkali (Centrale Supélec & Sagemcom, France); Michel Kieffer (CentraleSupélec, France); Massinissa Lalam (Sagemcom Broadband, France); Thierry Lestable (Sagemcom SAS, France)
- 17:24 *The Effects of Dynamic Environment on Channel Frequency Response-based Indoor Positioning*
Elmer Magsino, Ivan Wang-Hei Ho and Zhenhui Situ (The Hong Kong Polytechnic University, Hong Kong)
- 17:42 *Geometric-based KNN Localization Using Sensor Dissimilarity Information*
Duc A. Tran, Siyuan Gong and Quynh Vo (University of Massachusetts Boston, USA)

Thursday, October 12

09:00 - 10:30

TR4/S09: Wireless Emerging and Multimedia Services

- Chair: Madhusanka Liyanage (University of Oulu, Finland)
Room: St-Pierre
- 09:00 *Towards QoE-Aware HAS Video Streaming over LTE*
Ashkan Sobhani, Yassine Abdulsalam and Shervin Shirmohammadi (University of Ottawa, Canada)
- 09:18 *A Progressive Transmission Scheme for 3D Models in VR/AR Based on UEP-LT Code*
Yishi Liu (Beijing University Of Posts & Telecomm, P.R. China); Yitong Liu (Beijing University of Post and Telecommunications, P.R. China); Hongwen Yang (Beijing University of Posts and Telecommunications, P.R. China)
- 09:36 *Learning from Experience: A Dynamic Closed-Loop QoE Optimization for Video Adaptation and Delivery*
Imen Triki, Rachid El-Azouzi and Majed Haddad (University of Avignon, France); Quanyan Zhu and Zhiheng Xu (New York University, USA)
- 09:54 *Consumer Oriented IoT Data Discovery and Retrieval in Information Centric Networks*
Lijun Dong and Guoqiang Wang (Huawei, USA)
- 10:12 *MWQoE: A User-Centered Context-Aware Model for Evaluating the Mobile Web Quality of Experience*
Josephina Antoniou (University of Central Lancashire, Cyprus); Elias Allayiotis (University of Central Lancashire & UVIA Technologies LTD, Cyprus)

TR4/S10: Machine Learning and Data Analytics

- Chair: Shiwen Mao (Auburn University, USA)
Room: St-Laurent
- 09:00 *Locomotion Activity Recognition: A Deep Learning Approach*
Fuqiang Gu and Kourosh Khoshelham (The University of Melbourne, Australia); Shahrokh Valaee (University of Toronto, Canada)
- 09:18 *A Novel Mobility Prediction Scheme for Outdoor Crowded Scenario Using Fuzzy C-means*
Pengbo Yang, Xi Li, Hong Ji and Heli Zhang (Beijing University of Posts and

- 09:36 Telecommunications, P.R. China)
Detection of Anomalous Behavior of Smartphones Using Signal Processing and Machine Learning Techniques
Robin Joe Prabhakar Soundar Raja James (University Of Waterloo, Canada); Abdurhman Albasir, Kshirasagar Naik, Mohamed-Yahia Dabbagh and Prajna Dash (University of Waterloo, Canada); Marzia Zaman (Carleton University & Queens University, Cistel Technology Inc., Canada); Nishithi Goel (Cistel, Canada)
- 09:54 **A Convolutional Neural Network for Search Term Detection**
Hojjat Salehinejad (University of Toronto, Canada); Joseph Barfett (St. Michael's Hospital, Canada); Parham Aarabi, Shahrokh Valaee and Errol Colak (University of Toronto, Canada); Bruce Gray and Tim Dowdell (St. Michael's Hospital, Canada)
- 10:12 **Accurate Quantile Estimation for Skewed Data Streams**
Zheng Lin and Jun Liu, Dr. (Beijing University of Posts and Telecommunications, P.R. China); Nan Lin (Washington University in St. Louis, USA)

WS04 - TR4/S11: Economics of Wireless Virtualization (Joint Session)

- Chair: Irene Macaluso (Trinity College Dublin, Ireland)
Room: Lasalle
- 08:30 **Welcome and Opening Remarks**
- 08:38 **Keynote Speech by Toktam Mahmoodi on "Wireless Network Virtualization, Business Opportunities and Economic Aspects"**
- 09:18 **WS-04 Papers (three presentations at 09:18, 09:36, and 09:54)**
- 10:12 **Progressive Hybrid Greyfield Wireless Access Virtualization with Leveraged Combining of Cloud, Fog, and Legacy RANs**
Slim Zaidi (University of Quebec, INRS-EMT, Canada); Sofiene Affes (INRS-EMT, Canada); Mourad Azzakhmam (ETS, Canada); Charles Despins (ETS, University of Quebec, Canada); Keyvan Zarifi and Peiying Zhu (Huawei Technologies, Canada)

13:30 - 15:00

TR4/S12: Network Virtualization and Management I

- Room: St-Pierre
- 13:30 **User Association and Bandwidth Allocation for Terrestrial and Aerial Base Stations with Backhaul Considerations**
Elham Kalantari (University of Ottawa, Canada); Irem Bor-Yaliniz (Carleton University, Canada); Abbas Yongacoglu (University of Ottawa, Canada); Halim

WORKSHOP SESSIONS

WS-01 Communication for Networked Smart Cities (CORNER)

Thursday, October 12

08:30 - 10:30

WS01/S01: Communications for Networked Smart Cities I

- Chairs: Sumit Gautam (University of Luxembourg, Luxembourg), Dushantha Nalin K. Jayakody (National Research Tomsk Polytechnic University, Russia)
- Room: Verdun
- 08:30 **Welcome and Opening Remarks**
- 08:42 **Physical-Layer Network Coding: An Enabling Technology for Smart Cities**
Vaibhav Kumar, Barry G Cardiff and Mark F. Flanagan (University College Dublin, Ireland)
- 09:00 **Scheduling Services on an IoT Device Under Time-Weighted Pricing**
Ioannis Avgouleas, Nikolaos Pappas and Vangelis Angelakis (Linköping University, Sweden)
- 09:18 **Real-Time Cloud Robotics in Practical Smart City Applications**
Nazli Khan Beigi (Concordia University & C2RO Company, Canada); Bahar Partov (WaveLite Company, Canada); Soodeh Farokhi (C2RO Robotics, Canada)
- 09:36 **Urban Channel Models for Smart City IoT-Networks Based on Empirical Measurements of LoRa-links at 433 MHz and 868 MHz**

- Yanikomeroglu (Carleton University, Canada)
- 13:48 **Multiple Service Function Chaining Under Load Balance in SDN/NFV Networks**
Faqiang Liu, Xin Chen and Wei An (Institute of Information Engineering, Chinese Academy of Sciences, P.R. China); Yong Peng (Beijing University of Posts and Telecommunications, P.R. China); Jiuyue Cao and Yan Zhang (Institute of Information Engineering, Chinese Academy of Sciences, P.R. China)
- 14:06 **Software Defined VPLS Architectures: Opportunities and Challenges**
Madhusanka Liyanage (University of Oulu, Finland); Mika E Ylanttä (University of Oulu & Centre for Wireless Communications, Finland); Andrei Gurtov (Linköping University, Sweden)
- 14:24 **VNF-B&B: Enabling Edge-based NFV with CPE Resource Sharing**
He Zhu and Changcheng Huang (Carleton University, Canada)
- 14:42 **On-Road Feature Detection and Fountain-Coded Data Dissemination in Vehicular Ad-hoc Networks**
Yuhao Wang and Ivan Wang-Hei Ho (The Hong Kong Polytechnic University, Hong Kong)

16:30 - 18:00

TR4/S13: Network Virtualization and Management II

- Chair: Lijun Dong (Huawei, USA)
Room: Pointe-aux-Trembles
- 16:30 **A Cloud Native Solution for Dynamic Auto Scaling of MME in LTE**
Amogh PC and Goutham Veeramachaneni (Indian Institute of Technology Hyderabad, India); Anil Kumar Rangiseti (IIT HYDERABAD, India); Bheemarjuna Reddy Tamma (IIT Hyderabad, India); Antony Franklin A (Indian Institute of Technology Hyderabad, India)
- 16:48 **Market-Based Dynamic Service Mode Switching in Virtualized Wireless Networks**
Maria Dimakopoulou, Nicholas Bambos and Martin Valdez-Vivas (Stanford University, USA); John Apostolopoulos (Cisco Systems, USA)
- 17:06 **Accelerated Virtual Switching Support of 5G NFV-based Mobile Networks**
Joyce Mwangama and Neco Ventura (University of Cape Town, South Africa)
- 17:24 **Network Economics of SDN-Based Infrastructures: Can We Unlock Value Through ICN Multicast?**
Vaggelis G. Douros (Institute for Networked Systems, RWTH Aachen University, Germany); Janne Riihijärvi and Petri Mähönen (RWTH Aachen University, Germany)
- 17:42 **Session Adjournment**

- Pascal Jörke, Stefan Böcker and Florian Liedmann (TU Dortmund University, Germany); Christian Wietfeld (TU Dortmund University & Communication Networks Institute, Germany)
- 09:54 **Vehicle as a Resource for Continuous Service Availability in Smart Cities**
Moayad Aloqaily (Carleton University, Canada); Ismaeel Al Ridhawi (American University of the Middle East & University of Ottawa, Kuwait); Burak Kantarci and Hussein T. Mouftah (University of Ottawa, Canada)
- 10:12 **Acceptable Range of Spatial Density in an Ad Hoc Network of UAVs**
Ali Rakhshan (Johns Hopkins University, USA); Hossein Pishro-Nik (University of Massachusetts, Amherst, USA)

13:30 - 15:00

WS01/S02: Communications for Networked Smart Cities II

- Chair: Juan Duncan (University of Luxembourg, Luxembourg)
Room: Verdun
- 13:00 **KW-10 Keynote Speech by Masoud Ardakani on "Efficient Coding for Cloud Storage"**
- 13:30 **Green Process Offloading in Smart Home Scenarios**
Shahin Vakiliinia (Synchronmedia & Synchronmedia, Canada); Iman Vakiliinia (University of Nevada, Reno, USA); Mohamed Cheriet (Ecole de technologie supérieure (University of Quebec), Canada)

- 13:48 **Save-then-Transmit Scheme for Gaussian Channels Powered by Random Energy Harvesters**
Linsong Du (University of Electronic Science and Technology of China, P.R. China); Kun Yang (University of Essex, United Kingdom (Great Britain)); Chuan Huang (University of Electronic Science and Technology of China, P.R. China)
- 14:06 **Cache-enabled D2D Communication: A Social Perspective**
Yue Wang, Xiaofeng Tao and Xuefei Zhang (Beijing University of Posts and Telecommunications, P.R. China)
- 14:24 **Computationally Efficient Symbol-Level Precoding Communications Demonstrator**
Juan Duncan, Jevgenij Krivochiza, Stefano Andrenacci and Symeon Chatzinotas (University of Luxembourg, Luxembourg); Björn Ottersten (University of Luxembourg, Luxembourg)
- 14:42 **Distributed Zero-Forcing AF Beamforming for Energy-Efficient Communications in Networked Smart Cities**
Slim Zaidi (University of Quebec, INRS-EMT, Canada); Oussama Ben Smida (Institut National de la Recherche Scientifique, Canada); Sofiene Affes (INRS-EMT, Canada); Shahrokh Valaee (University of Toronto, Canada)

16:30 - 18:00

WS01/S03: Communications for Networked Smart Cities III

- Chair: Dushantha Nalin K. Jayakody (National Research Tomsk Polytechnic University, Russia)
- Room: Verdun
- 16:30 **Efficient Resource Allocation for Video Streaming for 5G Network-to-Vehicle Communications**
Farhan Pervaz (Saudi Telecom Company, Saudi Arabia); Abdulkareem Adinoyi (Saudi Telecommunications Company (STC), Saudi Arabia); Halim Yanikomeroglu (Carleton University, Canada)
- 16:48 **Connecting Mobility, Online Behavior and Urban Structure from Cellular Network Data**
Bo Wen and Yuanqian Qiao (Beijing University of Posts and Telecommunications, P.R. China); Wenhui Lin (Aisino, P.R. China); Jie Yang (Beijing University of Posts and Telecommunications, P.R. China)
- 17:06 **Throughput and Energy Consumption Trade-Off in Traffic Splitting in Heterogeneous Networks with Dual Connectivity**
Sandrine Boumard and Ilkka S. Harjula (VTT Technical Research Centre of Finland, Finland); Kari Horneman (N/a, Finland); Honglin Hu (Shanghai Advanced Research Institute, P.R. China)
- 17:24 **Integrating PNC and RLNC for BSM Dissemination in VANETs**
Minglong Zhang, Peter Han Joo Chong, Boon-Chong Seet and Saeed Ur Rehman (Auckland University of Technology, New Zealand); Arun Kumar (National University of Singapore, Singapore)
- 17:42 **Cognitive-Femtocell Based Resource Allocation in Macrocell Network**
Joydev Ghosh (National Research Tomsk Polytechnic University, RUSSIA, Russia); Dushantha Nalin K. Jayakody (National Research Tomsk Polytechnic University, Russia); Marwa Qararqe (Hamad Bin Khalifa University, Qatar)

WS-02 Cognitive Radio and Innovative Spectrum Sharing Paradigms for Future Networks (CRAFT 2017)

Thursday, October 12

09:00 - 10:30

WS02/S01: Fifth-Generation Networks

- Chair: Oliver Holland (King's College London, United Kingdom (Great Britain))
- Room: Lachine
- 09:00 **Welcome and Opening Remarks**
- 09:10 **Talk by Oliver Holland on "Thoughts on Database-Driven Spectrum Sharing for 5G"**
- 09:30 **Multiple Resource Reuse for D2D Communication with Uniform Interference in 5G Cellular Networks**
Abubaker Matovu Waswa (Technische Universität Ilmenau, Germany);

- Dariusht Mohammad Soleymani (Ilmenau University of Technology, Germany); Stephen S. Mwanje (Nokia Bell Labs, Germany); Jens Mueckenheim (University of Applied Sciences Merseburg, Germany); Andreas Mitschele-Thiel (Ilmenau University of Technology, Germany)
- 09:50 **On Active, Fine-Grained RAN and Spectrum Sharing in Multi-Tenant 5G Networks**
Shah Nawaz Khan (FBK CREATE-NET, Italy); Leonardo Goratti (FBK Create-Net, Italy); Roberto Riggio (FBK CREATE-NET, Italy); Shahriar Hasan (University of Trento, Italy)
- 10:10 **Leading Innovations Towards 5G: Europe's Perspective in 5G Infrastructure Public-Private Partnership (5G-PPP)**
Jose Alcaraz-Calero (University of the West of Scotland, United Kingdom (Great Britain)); Ioannis-Prodomos Belikaidis (WINGS ICT Solutions, Greece); Carlos J. Bernardos (Universidad Carlos III de Madrid, Spain); Pascal Bisson (Thales Group, France); Didier Bourse (Nokia, France); Michael Bredel (NEC Laboratories Europe, Germany); Daniel Camps-Mur (i2CAT Foundation, Spain); Tao Chen (VTT Technical Research Centre of Finland LTD, Finland); Xavier Costa-Perez (NEC Laboratories Europe, Germany); Panagiotis Demestichas (University of Piraeus, Greece); Mark Doll (Nokia Bell Labs & Nokia, Germany); Salah Eddine Elayoubi (Orange Labs, France); Andreas Georgakopoulos (WINGS ICT Solutions, Greece); Aarne O Mämmelä (VTT, Finland); Hans-Peter Mayer (Nokia Bell Labs, Germany); Miquel Payaró (CTTC, Spain); Bessem Sayadi (Nokia Bell-Labs, France); Muhammad Shuaib Siddiqui (Fundació i2CAT, Internet i Innovació Digital a Catalunya, Spain); Miurel Tercero (Ericsson AB, Sweden); Qi Wang (University of the West of Scotland, United Kingdom (Great Britain))

13:30 - 15:00

WS02/S02: Resource Allocation and Access

- Chair: Pawel Kryszkiewicz (Poznan University of Technology, Poland)
- Room: Lachine
- 13:30 **Machine Learning Based Scheme for Contention Window Size Adaptation in LTE-LAA**
Zoraze Ali (Centre Tecnològic de Telecomunicacions de Catalunya (CTTC), Spain); Lorenza Giupponi, Josep Mangues-Bafalluy and Biljana Bojovic (Centre Tecnològic de Telecomunicacions de Catalunya (CTTC), Spain)
- 13:48 **Multi-RAT Scheduling for Heterogeneous Networks**
Pawel Kryszkiewicz (Poznan University of Technology, Poland)
- 14:06 **Low-Complexity Uplink Resource Allocation Algorithm Based on Hypergraph Clustering for D2D Communications**
Yifang Ren and Gang Chuai (Beijing University of Posts and Telecommunications, P.R. China)
- 14:24 **Adjacent Channel Interference Cancellation for Robust Spectrum Sharing in Satellite Communications Systems**
Tri Minh Nguyen (EMT-INRS, University of Quebec, Canada); Long Bao Le (INRS, University of Quebec, Canada)
- 14:42 **Optimal Energy Harvesting Time and Power Allocation Policy in CRN Under Security Constraints from Eavesdroppers**
Hung Tran (Malardalen University, Sweden); Truong Xuan Quach (TNU-University of Information and Communication Technology, Vietnam); Ha-Vu Tran (University of Québec, Canada); Elisabeth Uhlemann (Malardalen University, Sweden)

16:30 - 18:00

WS02/S03: Context and Constraints

- Chair: Kareem E. Baddour (Communications Research Centre Canada, Canada)
- Room: Lachine
- 16:30 **Detection Capacity of Multidetector Networks with Applications to Cognitive Radio**
Ghurumuruhan Ganesan (NYU Abu Dhabi)
- 16:48 **Analytical Study on the Estimation of Primary Activity Distribution Based on Spectrum Sensing**
Ahmed Al-Tahmeesschi (The University of Liverpool, United Kingdom (Great Britain))

- 17:06 Britain)); Miguel López-Benítez (University of Liverpool, United Kingdom (Great Britain)); Kenta Umebayashi (Tokyo University of Agriculture and Technology, Japan); Janne Lehtomäki (University of Oulu, Finland)
Spectrum Sharing Opportunities in Land Mobile Radio Bands: A Data-Driven Approach
Humphrey Rutagemwa (Communications Research Centre (CRC), Canada); Kareem E. Baddour and Amir Ghasemi (Communications Research Centre Canada, Canada)
- 17:24 **Performance of Cognitive Spatial Modulation MIMO Systems Under Transceiver Hardware Impairments**
Ali Afana (Lakehead University, Canada); Najah A. Abu Ali (UAEU, United Arab Emirates); Salama Said Ikki (Lakehead University, Canada)
- 17:42 **Discussion on Conclusions and Observations/Take-Aways from the Workshop**

WS-03 Coexisting Radio and Optical Wireless Deployments (CROWD 2017)

Thursday, October 12

13:30 - 15:00

WS03 - TR1/S43: Coexisting Radio and Optical Wireless (Joint Session)

- Chair: Imene Trigui (University of Toronto, Canada)
Room: St-Michel
- 13:30 **Interference-Limited Mixed Malaga-M and Generalized-K Dual-Hop FSO/RF Systems (submitted and accepted in Track 1)**
Imene Trigui (University of Toronto, Canada); Nesrine Cherif (INRS, Canada); Sofiene Affes (INRS-EMT, Canada); Xianbin Wang (Western University, Canada); Victor C.M. Leung (University of British Columbia, Canada); Alex Stéphenne (Ericsson & INRS-EMT, Canada)
- 13:48 **Hybrid LiFi - WiFi Indoor Broadcasting System (submitted and accepted in Track 1)**
Akash Gupta (Netaji Subhas Institute of Technology, India); Parul Garg (Netaji Subhas Institute of Technology, New Delhi, India); Nikhil Sharma (The LNM Institute of Information Technology, Jaipur, India)
- 14:06 **On the Performance of AF Based Mixed Triple-Hop RF/FSO/RF Communication System (submitted and accepted in Track 1)**
Sanya Anees (Indian Institute of Information Technology - Guwahati, India); P. Sai Shri Harsha (Indian Institute of Information Technology Guwahati, India); Manav Bhatnagar (Indian Institute of Technology Delhi, India)
- 14:24 **Combination of Visible Light and Radio Frequency Bands for Device-to-Device Communication**
Zdenek Becvar, Pavel Mach, Mehvar Najla and Stanislav Zvanovec (Czech Technical University in Prague, Czech Republic)
- 14:42 **Why Would 5G Need Optical Wireless Communications?**
Tezcan Cogalan (University of Edinburgh, United Kingdom (Great Britain)); Harald Haas (The University of Edinburgh, United Kingdom (Great Britain))

WS-04 The Economics of Wireless Network Virtualization

Thursday, October 12

08:30 - 10:30

WS04 - TR4/S11: Economics of Wireless Virtualization (Joint Session)

- Chair: Irene Macaluso (Trinity College Dublin, Ireland)
Room: Lasalle
- 08:30 **Welcome and Opening Remarks**
- 08:38 **KW-09 Keynote Speech by Toktam Mahmoodi on "Wireless Network Virtualization, Business Opportunities and Economic Aspects"**
- 09:18 **Inter-Operator Dynamic Capacity Sharing for Multi-Tenant Virtualized PON**
Nima Afriz (CONNECT Center, Trinity College Dublin, Ireland); Amr Elrasad (Trinity College Dublin, Ireland); Hamed Ahmadi (University College Dublin, Ireland); Marco Ruffini (CTVR, Trinity College Dublin, Ireland)
- 09:36 **Exploring the Economical Benefits of Virtualized Wireless Sensor Networks**
Roland Katona (Cork Institute of Technology, Ireland); Victor Cionca (Cork Institute of Technology & Nimbus Centre, Ireland); Donna O'Shea and Dirk

- 09:54 **5G via Evolved Packet Core Slices: Costs and Technology of Early Deployments**
Wolfgang Kiess (DOCOMO Euro-Labs, Germany); Malla Reddy Sama (DOCOMO Euro-labs, Germany); József Varga (Nokia, Hungary); Johannes Prade (Nokia, Germany); Hans-Jochen Morper and Klaus Hoffmann (Nokia Bell Labs, Germany)
- 10:12 **Progressive Hybrid Greyfield Wireless Access Virtualization with Leveraged Combining of Cloud, Fog, and Legacy RANs (submitted and accepted in Track 4)**
Slim Zaidi (University of Quebec, INRS-EMT, Canada); Sofiene Affes (INRS-EMT, Canada); Mourad Azzakhmam (ETS, Canada); Charles Despains (ETS, University of Quebec, Canada); Keyvan Zarifi and Peiyang Zhu (Huawei Technologies, Canada)

WS-05 Personalized Mobile Applications for Smart Cities and Smart Citizens (PMA 2017)

Wednesday, October 11

08:30 - 10:30

WS05/S01: Personalized Mobile Apps for Smart Cities and Citizens

- Chairs: Mesut Günes (Otto von Guericke University Magdeburg, Germany), Grahame Smith (Liverpool John Moores University, United Kingdom (Great Britain))
Room: Verdun
- 08:30 **Smart Cardiac Health Management in IoT Through Heart Sound Signal Analytics and Robust Noise Filtering**
Arijit Ukil (Tata Consultancy Services, India); Uttam Kumar Roy (Jadavpur University, India)
- 08:50 **Real-time Cellular Activity Monitoring Using LTE Radio Measurements**
Mohammed M. Olama, Teja Kuruganti, Miljko Bobrek, Stephen Killough and James Nutaro (Oak Ridge National Laboratory, USA); Gautam Thakur (Oak Ridge National Laboratory & Computational Data Analytics, USA)
- 09:10 **Optimized Indoor Positioning for Static Mode Smart Devices Using BLE**
Quang Huy Nguyen, Princy Johnson, Trung Nguyen and Martin Randles (Liverpool John Moores University, United Kingdom (Great Britain))
- 09:30 **Deploying a BTLE Positioning System: Practical Issues on Calibration**
Ana M. Bernardos (Universidad Politécnica de Madrid, Spain); Luca Bergesio, Eduardo Metola and Daniel Ortiz (Universidad Politécnica de Madrid, Spain); Jose R Casar (Universidad Politécnica de Madrid, Spain)
- 09:50 **Decentralized Iterative Community Clustering Approach (DICC)**
Amhmed Bhih, Princy Johnson, Trung Nguyen and Martin Randles (Liverpool John Moores University, United Kingdom (Great Britain))
- 10:10 **Personalized Mobile Rapid Sentence Reading with Multi-lingual Extension**
Toshiyuki Maeda (Hannan University, Japan)

13:30 - 15:00

WS05/S02: Tutorial by Grahame Smith on "Co-Creation Technique - The User-Centric Living Labs Approach"

Room: Verdun

16:30 - 18:30

WS05/S03: Personalized Mobile Apps for Smart Cities and Citizens II

- Chairs: Princy Johnson (Liverpool John Moores University, United Kingdom (Great Britain)), Grahame Smith (Liverpool John Moores University, United Kingdom (Great Britain))
Room: Verdun
- 16:30 **WS05/S03: Networking Session and Elevator Pitch**
- 17:00 **Securing Critical Infrastructure in Smart Cities: Providing Scalable Access Control for Constrained Devices**
Marian Buschsieweke (Otto-von-Guericke University Magdeburg, Germany);

- 17:18 Mesut Günes (Otto von Guericke University Magdeburg, Germany)
Service Management Platform to Support Service Migrations for IoT Smart City Applications
Kai Kientopf, Saleem Raza, Simon Lansing and Mesut Günes (Otto von Guericke University Magdeburg, Germany)
- 17:36 *Understanding Correlation Between Offline Mobility and Online Browsing Tendency in Mobile Network*
Qi Li and Yuanyuan Qiao (Beijing University of Posts and Telecommunications, P.R. China); Wenhui Lin (Aisino, P.R. China); Jie Yang (Beijing University of Posts and Telecommunications, P.R. China)
- 17:54 *Optimized Mobility Models for Disaster Recovery Using UAVs*
Onye Erim (Liverpool John Moores University, United Kingdom (Great Britain)); Colin Wright (, United Kingdom (Great Britain))
- 18:12 *A Fast Path Matching Algorithm for Indoor Positioning System Using Magnetic Field Measurements*
Zixiang Ma, Stefan Poslad, Shaoxiong Hu and Xiaoshuai Zhang (Queen Mary University of London, United Kingdom (Great Britain))

WS-06 Full-Duplex Technologies (FDX 2017)

Tuesday, October 10

09:00 - 10:30

WS06/S01: Full-Duplex Technologies: Interference

- Chair: Yingbo Hua (University of California, Riverside, USA), Tho Le-Ngoc (McGill University, Canada)
- Room: Verdun
- 09:00 *Vectoring-Based Dynamic Spectrum Management for G.fast Multi-User Full-Duplex Transmission*
Wouter Lanneer and Jeroen Verdyck (KU Leuven, Belgium); Paschalis Tsiaflakis (Bell Labs, Nokia, Belgium); Jochen Maes (Nokia Bell Labs, Belgium); Marc Moonen (KU Leuven, Belgium)
- 09:22 *Impact of User Terminal Antenna Spacing on Inter-Terminal Interference Cancellation in Multi-User Full Duplex MIMO Transmission*
Atsuto Kawagoe and Naoki Honma (Iwate University, Japan); Nobuyasu Takemura (Nippon Institute of Technology, Japan)
- 09:45 *Interference Cancellation in Full-Duplex Multi-Cell Networks*
Huan Wu (Huawei Technologies Canada Co Ltd., Canada); Eddy Hum (Huawei Technologies, Canada); Wanyi Shiu (Huawei Technologies Canada Co. Ltd., Canada); James Griffiths (Huawei Technologies Canada Ltd, Canada)
- 10:07 *Coupling Channel Estimation Based Self-Interference Cancellation in Massive MIMO Full-Duplex System*
Daimeng Chen, Fangfang Liu, Chunyan Feng and Wen Zhao (Beijing University of Posts and Telecommunications, P.R. China)

13:00 - 15:00

- Room: Verdun
- 13:00 *KW-03 Keynote Speech by Yang-Seok Choi on "Full-Duplex MIMO - Algorithms and PoC Performance"*
- 14:00 *KW-04 Keynote Speech by Yingbo Hua on "Secure Wireless Communication with Full-Duplex Radio"*

16:30 - 18:00

WS06/S03 : Full-Duplex Communications: Systems and Networks

- Chair: Yang-Seok Choi (Intel, USA), Shilpa Talwar (Intel, USA)
- Room: Verdun
- 16:30 *Area Spectral Efficiency and Coverage for Mixed Duplexing Networks with Directional Transmissions*
Sanjay Goyal and Alphan Sahin (InterDigital Communications, USA); Robert L. Olesen (Interdigital Communications Corp., USA)
- 16:52 *Capacity Gain Analysis for Underlaying Full-Duplex D2D Communications with A Novel Interference Management Scheme*

- Xinjing Hou (Beijing University of Posts and Telecommunications, P.R. China); Fang Liu and Yuanan Liu (Beijing University of Posts and Telecom, P.R. China)
- 17:15 *Blind Polarization Oblique Projection Based Inter-User Interference Cancellation in Full Duplex Multiuser MIMO System*
Wen Zhao, Chunyan Feng, Fangfang Liu, Caili Guo and Yao Nie (Beijing University of Posts and Telecommunications, P.R. China)
- 17:37 *LDPC Encoding for Partial-Duplex Wireless Communication*
Hamid Reza Barzegar and Luca Reggiani (Politecnico di Milano, Italy)

WS-07 The Internet of Things (IoT), the Road Ahead: Applications, Challenges, and Solutions

Tuesday, October 10

08:30 - 10:30

WS07/S01: IoT - Road Ahead: Apps, Challenges and Solutions I

- Chair: Sassan Iraj (Aalto University, Finland)
- Room: Lachine
- 08:30 *Welcome and Opening Remarks*
- 08:38 *KW-01 Keynote Speech by Amit Mukhopadhyay on "IoT: Multiple Facets of its Impact on the Economy and our Society"*
- 09:18 *A Dynamic Bandwidth and Power Allocation Scheme for Cooperative D2D Communications*
Zeqian Ye and Qimei Cui (Beijing University of Posts and Telecommunications, P.R. China); Nan Hu (Beijing University of Posts & Telecommunications, P.R. China); Fan Yang (Beijing University of Posts and Telecommunications, P.R. China)
- 09:36 *ELIoT: Design of an Emulated IoT Platform*
Alli Mäkinen (Ericsson L M Oy Ab, Finland); Jaime Jiménez (Ericsson, Finland); Roberto Morabito (Ericsson Research, Finland)
- 09:54 *Energy Aware Routing for Internet of Things with Heterogeneous Devices*
Dudu Ok and Furqan Ahmed (KTH Royal Institute of Technology, Sweden); Piergiuseppe Di Marco (Ericsson, Sweden); Roman Chirikov (Ericsson AB, Sweden); Cicek Cavdar (KTH Royal Institute of Technology, Sweden)
- 10:12 *Enhanced Range-Free Localization in Wireless Sensor Networks Using a New Weighted Hop-Size Estimation Technique*
Mohamed Guadane (INRS-EMT, Canada); Wassima Bchimi (EPT, Tunisia); Abdelaziz Samet and Sofiene Affes (INRS-EMT, Canada)

13:00 - 15:00

WS07/S02: IoT - Road Ahead: Apps, Challenges and Solutions II

- Chair: Amira Alloum (Nokia Bell Labs, France)
- Room: Lachine
- 13:00 *KW-02 Keynote Speech by Ali Khayrallah on "5G for Smart City and Connected Industry"*
- 13:48 *A Traffic Model for Machine-Type Communications Using Spatial Point Processes*
Henning Thomsen, Carles Navarro Manchón and Bernard Henri Fleury (Aalborg University, Denmark)
- 14:06 *Combinatorial Code Designs for Ultra-Reliable IoT Random Access*
Christopher Boyd, Roope Vehkalahti and Olav Tirkkonen (Aalto University, Finland)
- 14:24 *Mathematical Model of LoRaWAN Channel Access with Capture Effect*
Dmitry Bankov, Evgeny Khorov and Andrey Lyakhov (IITP RAS, Russia)
- 14:42 *Applying Reliability Theory for Future Wireless Communication Networks*
Tom Höbner and Lucas Scheuven (TU Dresden, Germany); Norman Franchi (Dresden University of Technology, Germany); Meryem Simsek and Gerhard Fettweis (Technische Universität Dresden, Germany)

16:30 - 18:30

WS07/S03: IoT - Road Ahead: Apps, Challenges and Solutions III

- Chair: Roman Chirikov (Ericsson AB, Sweden)
- Room: Lachine

- 16:30 **Impact of Aggregation Factor on Delay Performance in Group-based Machine Type Communications**
Yu-Jia Chen, Zi Qi Wang and Li-Chun Wang (National Chiao Tung University, Taiwan)
- 16:48 **IoT-RF: A Routing Framework for the Internet of Things**
Muhammad Omer Farooq (Cork Institute of Technology, Nimbus Centre for Embedded Systems Research, Ireland); Thomas Kunz (Carleton University, Canada)
- 17:06 **MAC Layer Design and Evaluation of a Narrowband Wi-Fi System**
Yu Wang (Ericsson, Sweden); Luis Felipe Del Carpio (Ericsson Research, Finland); Dennis Sundman and Divya Peddireddy (Ericsson, Sweden); Anna Larmo (Ericsson Research, Finland)
- 17:24 **Near-Far Effect on Coded Slotted ALOHA**
Ehsan Ebrahimi Khaleghi and Cedric Adjih (INRIA, France); Amira Alloum (Nokia Bell Labs, France); Paul Muhlethaler (INRIA, France)
- 17:42 **On the Suitability of Bluetooth 5 for the Internet of Things: Performance and Scalability Analysis**
Stefan Böcker and Christian Arendt (TU Dortmund University, Germany); Christian Wietfeld (TU Dortmund University & Communication Networks Institute, Germany)
- 18:00 **Precision of RSS-based Indoor Geolocation in IoT Applications**
Julang Ying (Worcester Polytechnic Institute, USA); Kaveh Pahlavan (WPI, USA); Xinrong Li (University of North Texas, USA)
- 18:00 **Closing Remarks**

WS-08 Massive MIMO/FD-MIMO in 5G Mobile Communications

Wednesday, October 11

09:00 - 10:30

WS08/S01: Massive MIMO/FD-MIMO I

- Chairs: Tarek Djerfati (INRS-EMT, Canada), Abdelaziz Samet (INRS-EMT, Canada)
Room: Lachine
- 09:00 **Outdoor Experiments on 5G Radio Access Using Distributed MIMO and Beamforming in 28-GHz Frequency Band**
Daisuke Kurita, Kiichi Tateishi, Atsushi Harada and Yoshihisa Kishiyama (NTT DOCOMO, INC., Japan); Shoji Itoh (Nippon Ericsson, Japan); Hideshi Murai (Ericsson Japan, Japan); Arne Simonsson and Peter Ökvist (Ericsson Research, Sweden)
- 09:18 **Dual-polarized Square-Ring Slot-Coupled Patch Antenna for Massive MIMO Application**
Mingde Du and Dong Han (Huawei Technology Company, P.R. China)
- 09:36 **Impact of User Height on the Coverage of 3D Beamforming-Enabled Massive MIMO Systems**
Mahdi Baianifar (Iran University of Science & Technology (IUST), Sweden); Soheil Khavari (Iran University of Science & Technology (IUST), Iran); S. Mohammad Razavizadeh (IUST, Iran); Tommy Svensson (Chalmers University of Technology, Sweden)
- 09:54 **High Resolution CSI Feedback with Beam Space MIMO**
Ruiqi Zhang (Huawei Technologies Co. LTD, P.R. China); Yongxing Zhou (Huawei, P.R. China); Bingyu Qu (Huawei Technologies Co. LTD, P.R. China)
- 10:12 **A Flexible Feedback Framework for 5G Massive MIMO Systems**
Salam Akoum (AT&T Labs, USA); Xiaoyi Wang (NSN&NOKIA, USA); Arunabha Ghosh (AT&T Labs, Inc., USA)

13:00 - 15:00

WS08/S02: Massive MIMO/FD-MIMO II

- Chairs: Tarek Djerfati (INRS-EMT, Canada), Abdelaziz Samet (INRS-EMT, Canada)
Room: Lachine
- 13:00 **Welcome and Opening Remarks**
- 13:04 **KW-06 Keynote Speech by Frederick W. Vook on "Massive MIMO for the New Radio"**
- 13:44 **Two-dimension CSI Acquisition for Massive MIMO Systems**
Hui Li (China Academy of Telecommunications Technology (CATT), P.R. China); Runhua Chen (China Academy of Telecommunications Technology &

Datang Mobile, USA); Qiubin Gao, Rakesh Tamrakar and Shaohui Sun (China Academy of Telecommunications Technology (CATT), P.R. China)

- 14:02 **Hybrid Beamforming with Spatial Modulation in Multi-user Massive MIMO mmWave Networks**
Merve Yuzgecciglu and Eduard Jorswieck (TU Dresden, Germany)
- 14:20 **User Scheduling in Massive MIMO Systems with a Large Number of Devices**
Martin Kuerbis (University of Applied Sciences Mittweida, Germany); Naveen Mysore Balasubramanya and Lutz Lampe (University of British Columbia, Canada); Alexander Lampe (University of Applied Sciences Mittweida, Germany)
- 14:38 **Comparison of Access Point Distributions and Beamforming Strategies for Massive MIMO Networks : a Stochastic Geometry Approach**
Charles Wiame (Université Catholique de Louvain, Belgium); Luc Vandendorpe (Université catholique de Louvain, Belgium); Claude Oestges (Université Catholique de Louvain, Belgium)
- 14:56 **Closing Remarks**

WS-09 New Radio Technologies (NR)

Tuesday, October 10

09:00 - 10:30

WS09/S01: New Radio Technologies I

- Chair: Shao-Yu Lien (National Chung Cheng University, Taiwan)
Room: Lasalle
- 08:55 **Welcome and Opening Remarks**
- 09:00 **Outage Reduction with Joint Scheduling and Power Allocation in 5G mmWave Cellular Networks**
Chun-Han Yao, Yin-Yi Chen, Biswa PS Sahoo and Hung-Yu Wei (National Taiwan University, Taiwan)
- 09:18 **Enhancing TCP End-to-End Performance in Millimeter-Wave Communications**
Minho Kim (Yonsei University, Korea); Seung-Woo Ko (The University of Hong Kong, Hong Kong); Seong-Lyun Kim (Yonsei University, Korea)
- 09:36 **A Contention-based Initial Beam Search Scheme for mmWave Cellular Communications**
Soojung Jung and SeungKwon Baek (ETRI, Korea)
- 09:54 **Prioritized Resource Reservation for Reducing Random Access Delay in 5G URLLC**
Yu-Jia Chen, Li-Yu Cheng and Li-Chun Wang (National Chiao Tung University, Taiwan)
- 10:12 **PSMA for 5G: Network Throughput Analysis**
Mohammad Moltafet (TMU, Iran); Nader Mokari (Tarbiat Modares University, Iran); Mohammad Reza Javan (Shahrood University of Technology, Iran); Hamid Saeedi (Tarbiat Modares University, Iran); Hossein Pishro-Nik (University of Massachusetts, Amherst, USA)

13:30 - 15:00

WS09/S02: New Radio Technologies II

- Chair: Shao-Yu Lien (National Chung Cheng University, Taiwan)
Room: Lasalle
- 13:30 **Generalized Subband-Filtered and Pulse-Shaped Multicarrier for Quasi-Synchronous Uplink Access**
Wooram Shin (Electronics and Telecommunications Research Institute, Korea); Gi Yoon Park (ETRI, Korea); Gerhard Wunder (FU Berlin, Heisenberg Communications and Information Theory Group, Germany); SeungKwon Baek (ETRI, Korea); Joonhyuk Kang (KAIST, Korea)
- 13:48 **Precoding for Generalized Frequency Division Multiplexing with Linear Receivers**
Aman Sikri (IIT(BHU), Varanasi, India); K Venkata Srinivas (Indian Institute of Technology (BHU), Varanasi, India)
- 14:06 **Applying Bit-level Probabilistically Shaped Coded Modulation for High-throughput Communications**
Marcin Pikus (Huawei Technologies Duesseldorf & Institute for Communications Engineering, TU Munich, Germany); Wen Xu (Huawei

- Technologies Dueseldorf GmbH & - European Research Center (ERC), Germany)
- 14:24 **Design and Implementation of NOMA Subband Scheduling Towards Larger Bandwidth Beyond LTE-A**
Quang-Tuan Thieu (National Taiwan University & Graduate Institute of Communication Engineering, Taiwan); Chun Wang, Chun-Hsiung Wang and Hung-Yun Hsieh (National Taiwan University, Taiwan)
- 14:42 **Precoded OFDM for Asynchronous Uplink with Transparency to OFDM Receiver**
Saeed Afrasiabi-Gorgani (Free University of Berlin, Germany); Gerhard Wunder (FU Berlin, Heisenberg Communications and Information Theory Group, Germany); Wooram Shin (Electronics and Telecommunications Research Institute, Korea)

16:30 - 18:00

WS09/S03: New Radio Technologies III

- Chair: Shao-Yu Lien (National Chung Cheng University, Taiwan)
Room: Lasalle
- 16:30 **Hooke Jeeves Search Method for Initial Beam Access in 5G mmWave Cellular Networks**
Mohammed Jasim (University of South Florida, USA); Adel Aldabhi (New Jersey Institute Of Technology, USA); Abdallah A Khreishah (New Jersey Institute of Technology, USA); Nasir Ghani (University of South Florida, USA)
- 16:48 **A Comparison of Beam Refinement Algorithms for Millimeter Wave Initial Access**
Hao Guo, Behrooz Makki and Tommy Svensson (Chalmers University of Technology, Sweden)
- 17:06 **Improved Spatially-Coupled Multiuser Transmission via Constellation Rotation**
Min Jiang and Zhongwei Si (Beijing University of Posts and Telecommunications, P.R. China)
- 17:24 **Network Slicing via Function Decomposition and Flexible Network Design**
Dionidis S. Michalopoulos (Nokia Bell Labs, Germany); Mark Doll (Nokia Bell Labs & Nokia, Germany); Vincenzo Sciancalepore (NEC Europe Ltd., Germany); Dario Bega (IMDEA Networks, Spain); Peter Schneider (Nokia Bell Labs, Germany); Peter Rost (Nokia Networks, Germany)
- 17:42 **Channel Estimation and Optimal Pilot Signals for Universal Filtered Multi-carrier (UFMC) Systems**
Lei Zhang (University of Glasgow, United Kingdom (Great Britain)); Chang He and Juquan Mao (University of Surrey, United Kingdom (Great Britain)); Ayesha Ijaz (University of Surrey & Centre for Communication Systems Research, United Kingdom (Great Britain)); Pei Xiao (University of Surrey, United Kingdom (Great Britain))

WS-10 Radio Transmission Technologies with Evolution and Self-Learning Algorithms (RTT-ESLA)

Wednesday, October 11

08:30- 10:30

WS10/S01: Full Radio with Evolution and Self Learning

- Chair: Xiaojie Wang (Beijing University of Posts and Telecommunications, P.R. China)
Room: Lasalle
- 08:30 **KW-05 Keynote Speech by Kai Niu on "Learning to Decode"**
- 09:00 **Research on Machine Learning Algorithms and Feature Extraction for Time Series**
Lei Li (Beijing University of Posts And Telecommunications, P.R. China); Yabin Wu, Yihang Ou, Qi Li and Yanquan Zhou (Beijing University of Posts and Telecommunications, P.R. China); Daoxin Chen (CapInfo Company Limited, P.R. China)
- 09:15 **Activation Functions of Deep Neural Networks for Polar Decoding Applications**
Jihoon Seo, Juyul Lee and Keunyoung Kim (ETRI, Korea)
- 09:30 **Position-Aided Millimeter Wave V2I Beam Alignment: A Learning-to-Rank**

Approach

Vutha Va (University of Texas at Austin, USA); Takayuki Shimizu (TOYOTA InfoTechnology Center USA, USA); Gaurav Bansal (Toyota InfoTechnology Center, USA); Robert Heath (The University of Texas at Austin, USA)

09:45 **Recognizing Clothing Images with Extreme Learning Machines (WITHDRAWN)**

Ruifan Li and Haoyu Liang (Beijing University of Post and Telecommunications, P.R. China)

10:00 **Jointly Positioning Multiple Users in Aid of User-to-User Distances**
Yi Wang (Huawei Technologies Co., Ltd, P.R. China); Beihua Wu (East China University of Political Science and Law, P.R. China); Zhenyu Shi (Huawei Technologies Co., Ltd, P.R. China)

10:15 **User Positioning by Exploring MIMO Measurements with Particle Swarm Optimization**
Zhenyu Shi and Yi Wang (Huawei Technologies Co., Ltd, P.R. China)

WS-11 V2X Channel Measurements and Modeling (WVCM 2017)

Wednesday, October 11

13:30 - 15:00

WS11/S01: V2X Channel Measurements and Modeling I

- Chairs: Mate Boban (Huawei German Research Center, Germany), Fredrik Tufvesson (Lund University, Sweden)
Room: Lasalle
- 13:30 **Welcome and Opening Remarks**
- 13:40 **KW-07 Keynote Speech by Fredrik Tufvesson on "Channel Characteristics for Cooperative ITS and Positioning"**
- 14:30 **Sparse Time-Variant Impulse Response Estimation for Vehicular Channels Using the c-LASSO**
Thomas Blazek (TU Wien, Austria); Christoph F Mecklenbräuker (Vienna University of Technology, Austria)
- 14:45 **Time-varying K Factor of the mm-Wave Vehicular Channel: Velocity, Vibrations and the Road Quality Influence**
Jiri Blumenstein (Brno University of Technology, Czech Republic); Ales Prokes (Brno University of Technology & Sensor, Information and Communication Systems Research Centre, Czech Republic); Josef Vychodil (Brno University of Technology & BUT Brno, Czech Republic); Martin Pospíšil and Tomas Mikulasek (Brno University of Technology, Czech Republic)

16:30 - 18:30

WS11/S02: V2X Channel Measurements and Modeling II

- Chairs: Mate Boban (Huawei German Research Center, Germany), Fredrik Tufvesson (Lund University, Sweden)
Room: Lasalle
- 16:30 **KW-08 Keynote Speech by David Steer on "Observations on V2X Channel Modeling Requirements and Standards"**
- 17:20 **Vehicle-to-Vehicle Propagation Channel for Truck-to-Truck and Mixed Passenger Freight Convoy**
Rui Wang (University of Southern California, USA); Olivier Renaudin (Austrian Institute of Technology, Austria); C. Umit Bas, Seun Sangodoyin and Andreas Molisch (University of Southern California, USA)
- 17:35 **On the Higher Order Statistics of Car Clustering in Vehicle Communications Networks on a Road**
Gleb Dubosarskii (The University of Western Ontario, Canada); Serguei Primak (University of Western Ontario, Canada); Xianbin Wang (Western University, Canada)
- 17:50 **mmWave Channel Propagation Modeling for V2X Communication Systems**
Bogdan Antonescu, Miedad Tehrani Moayyed and Stefano Basagni (Northeastern University, USA)
- 18:05 **A Simulator of Spatially Correlated Complex-Valued Nakagami-m Fading Channels**
Jia-Chin Lin (National Central University, Taiwan)
- 18:20 **Closing Remarks**

SPECIAL SESSIONS

SP-04 Resource-Efficient, Reliable and Secure Internet of Things in the 5G Era (R2SIOT-5G)

Tuesday, October 10

09:00 - 10:30

SP4/S01: Resource-Efficient, Reliable, and Secure IoT in the 5G Era I

Chair: Shree Krishna Sharma (University of Western Ontario, Canada)

Room: St-Léonard

- 09:00 *Resilient End-to-end Connectivity for Software Defined Unmanned Aerial Vehicular Networks*
Gökhan Seçinti (Istanbul Technical University, Turkey); Parisa Darian (North eastern University, USA); Berk Canberk (Istanbul Technical University, Turkey); Kaushik Chowdhury (Northeastern University, USA)
- 09:18 *On Mutual Information of Measured 60 GHz Wideband Indoor MIMO Channels: Time Domain Singular Values*
Jiri Blumenstein, Roman Marsalek and Tomas Gotthans (Brno University of Technology, Czech Republic); Ronald Nissel and Markus Rupp (TU Wien, Austria)
- 09:36 *Composition Properties of Bayesian Differential Privacy*
Jun Zhao (Carnegie Mellon University / Nanyang Technological U, USA)
- 09:54 *Dynamic Network Slicing and Resource Allocation for Heterogeneous Wireless Services*
Jeongho Kwak (Trinity College Dublin); Joon Young Moon and Hyang-Won Lee (Konkuk University, Korea); Long Bao Le (INRS, University of Quebec, Canada)
- 10:12 *Session Adjournment*

13:30 - 15:00

SP4/S02: Resource-Efficient, Reliable, and Secure IoT in the 5G Era II

Chair: Shree Krishna Sharma (University of Western Ontario, Canada)

Room: St-Léonard

- 13:30 *Energy-saving Traffic Scheduling in Hybrid Software Defined Rechargeable WSNs*
Xiaohui Ma, Yunkai Wei and Ning Yang (University of Electronic Science and Technology of China, P.R. China)
- 13:48 *Security Establishment for IoT Environments in 5G: Direct MTC-UE Communications*
Filipe Conceição (Telecom SudParis & CEA Saclay, France); Nouha Oualha (CEA, LIST, France); Djamal Zeghlache (Institut Mines-Telecom, Telecom SudParis & UMR 5157 CNRS - Samovar, France)
- 14:06 *Capacity and Coverage Analysis for FD-MIMO Based THz Band 5G Indoor Internet of Things*
Nabil Khalid and Naveed Ahmed Abbasi (Koc University, Turkey); Ozgur B. Akan (University of Cambridge, United Kingdom (Great Britain))
- 14:24 *Channel-Based Mapping Diversity for Enhancing the Physical Layer Security in the Internet of Things*
Sasi Pechetti (Indian Institute of Technology, Delhi, India); Abhishek Jindal (Indian Institute of Technology Delhi, India); Ranjan Bose (Indian Institute of Technology, India)
- 14:42 *Bluetooth Now or Low Energy: Should BLE Mesh Become a Flooding or Connection Oriented Network?*
Yuri Murillo and Brecht Reynders (KU Leuven, Belgium); Alessandro Chiu mento (Katholieke Universiteit Leuven, Belgium); Salman Malik (Televic, Belgium); Pieter Crombez (Televic Health Care NV, Belgium); Sofie Pollin (KU Leuven, Belgium)

SP-01 Big Data-Enabled 5G Systems

Tuesday, October 10

16:30 - 18:00

SP1: Big Data-Enabled 5G Systems

Chair: Zied Bouida (Carleton University, Canada)

Room: Fundy

- 16:30 *A Study of Deep Learning Networks on Mobile Traffic Forecasting*
Chih-Wei Huang and Chiu-Ti Chiang (National Central University, Taiwan); Qiuhui Li (Chongqing University, P.R. China)
- 16:48 *Data Caching and Selection in 5G Networks Using F2F Communication*
Ismaeel Al Ridhawi (American University of the Middle East & University of Ottawa, Kuwait); Nour Mostafa (American University of the Middle East, Kuwait); Yehia Kotb (American University of the Middle east, Kuwait); Moayad Aloqaily and Ibrahim Abualhaol (Carleton University, Canada)
- 17:06 *High-Resolution Wideband Spectrum Sensing Based on Sparse Bayesian Learning*
Peng Cheng (The University of Sydney, Australia); Yonghui Li (University of Sydney, Australia); Zhuo Chen (CSIRO ICT Centre, Australia); Branka Vucetic (University of Sydney, Australia)
- 17:24 *Session Adjournment*

SP-03 Advanced Antennas for 5G Wireless Communications Networks

Wednesday, October 11

09:00 - 10:30

SP3/S01: Advanced Antennas for 5G Wireless Communications Networks I

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

Room: St-Léonard

- 09:00 *Wideband Self-Sustained DRA Fed by Printed Ridge Gap Waveguide at 60 GHz*
Hussien Attia (King Fahd University of Petroleum and Minerals, Saudi Arabia); Ahmed Kishk (Concordia University, Canada)
- 09:18 *Iterative Semidefinite Relaxation-Based Hybrid Precoding Algorithm for mmWave LS-MIMO Systems (WITHDRAWN)*
Moufida Hajjaj (SUP'COM, Tunisia); Ameni Mejri (National Engineering School of Tunis & SYS'COM Laboratory, Tunisia); Ridha R. Bouallegue, B. (Ecole Supérieure des Communications de Tunis, Tunisia); Salem Has naoui (National School of Engineering of Tunis, Tunisia)
- 09:36 *Millimeter-Wave Beam-Steering Antenna Array for 5G Applications*
Mohamad Mantash and Tayeb A. Denidni (INRS-EMT, Canada)
- 09:54 *A Design of Multi-User MIMO Communications Antenna Enhanced by Meta materials for 5G Application (WITHDRAWN)*
Mondher Labidi (Innov'com, Tunisia)
- 10:12 *Session Adjournment*

13:30 - 15:00

SP3/S02: Advanced Antennas for 5G Wireless Communications Networks II

Chair: Mohamad Mantash (INRS-EMT, Canada)

Room: St-Léonard

- 13:30 *A Compact Dual Standard MIMO Antenna System for Mobile Applications*
Muhamamd Ikram (University of Queensland, Australia); Mohammad S. Sharawi (King Fahd University of Petroleum and Minerals (KFUPM), Saudi Arabia); Hussien Attia (King Fahd University of Petroleum and Minerals, Saudi Arabia)
- 13:48 *60 GHz Circularly Polarized Dielectric Resonator Antenna Fed by Printed Ridge Gap Waveguide*
Md Hosne Mobarok Shamim and Hussien Attia (King Fahd University of Petroleum and Minerals, Saudi Arabia); Mohammad S. Sharawi (King Fahd University of Petroleum and Minerals (KFUPM), Saudi Arabia); Ahmed Kishk (Concordia University, Canada)
- 14:06 *Compact UWB MIMO Antenna with Asymmetric Coplanar Strip Feeding Configuration*
Ahmed Ibrahim (El-Minia University, Egypt); Jan Machác (Czech Technical University in Prague, Czech Republic); Raed Shubair (Massachusetts Institute of Technology (MIT), USA); Milan Svanda (Czech Technical University in Prague, Czech Republic)

- 14:24 *A Compact UWB MIMO Antenna with Inverted U-Shaped Slot for WLAN Rejection*
Talha Asghar (COMSATS Institute of Information Technology, Pakistan); Bilal Ijaz (COMSATS Institute of Information Technology, Pakistan); Khurram S Alimgeer (COMSATS Institute of Information Technology, Pakistan); Muhammad Saeed Khan (University of Padova, Italy); Raed Shubair (Massachusetts Institute of Technology (MIT), USA)
- 14:42 *A Design of Phased Array Antenna with Metamaterial Circular SRR for 5G Applications*
Chaker Essid (Tunisia & Tunisia Polytechnic School Carthage University, Tunisia); Abdelaziz Samet (INRS-EMT, Canada)

SP-05 5G Wireless Technologies for V2X Communications

Wednesday, October 11

13:30 - 15:00

SP5/S01: 5G Wireless Technologies for V2X I

- Chair: Long Bao Le (INRS, University of Quebec, Canada)
Room: Jacques-Cartier
- 13:30 *A Blockchain-based Reputation System for Data Credibility Assessment in Vehicular Networks*
Zhe Yang (BUPT, P.R. China); Kan Zheng (Beijing University of Posts&Telecommunications, P.R. China); Kan Yang (University of Memphis, USA); Victor C.M. Leung (University of British Columbia, Canada)
- 13:48 *A Comparative Study of Possible Solutions for Transmission of Vehicular Safety Messages in LTE-based Networks*
Hossein Soleimani and Azzedine Boukerche (University of Ottawa, Canada)
- 14:06 *DPS Signaling with OFDM-like Complexity and Superior SER Performance in 5G Doubly Dispersive Scenarios*
Karim Said (Virginia Tech, USA); A. A. (Louis) Beex (DSPRL - Wireless@VT & Virginia Tech, USA)
- 14:24 *A Base Station Selection Scheme for Handover in a Mobility-Aware Ultra-Dense Small Cell Urban Vehicular Environment*
Shipra Kapoor and David Grace (University of York, United Kingdom (Great Britain)); Tim Clarke (York University, United Kingdom (Great Britain))
- 14:42 *Session Adjournment*

16:30 - 18:00

SP5/S02: 5G Wireless Technologies for V2X II

- Chair: Long Bao Le (INRS, University of Quebec, Canada)
Room: St-Pierre
- 16:30 *Reliable Vehicle Location in Electronic Toll Collection Service with Cooperative Intelligent Transportation Systems*
Malalatiana Randriamasy (Normandie Univ, UNIROUEN, ESIGEEC, IRSEEM & Sanef, France); Adnane Cabani (ESIGEEC/IRSEEM, France); Chafouk Houcine (Institut de Recherche en Systèmes Electroniques EMbarqués (IR SEEM), France); Guy Fremont (Sanef, France)
- 16:48 *MAP-RP: Map-based Resource Reselection Procedure for Autonomous LTE-V2V*
Giammarco Cecchini (CNR - IEIT, Italy); Alessandro Bazzi (CNR, Italy); Barbara M Masini (CNR - IEIT & University of Bologna, Italy); Alberto Zanella (Istituto di Elettronica e di Ingegneria dell'Inform. e delle Telecomunicazioni, Italy)
- 17:06 *A Predictive Collision Detection Protocol Using Vehicular Network*
Noura Aljeri and Azzedine Boukerche (University of Ottawa, Canada)
- 17:24 *Polarization Mode Dispersion Estimation Algorithm Based on Selection Combining in Dual-Polarized Channels*
Bingcheng Wang, Fangfang Liu, Chunyan Feng and Shulun Zhao (Beijing University of Posts and Telecommunications, P.R. China)
- 17:42 *Session Adjournment*

SP-06 Mission-Critical Communications: Advancements, Challenges, and Opportunities

Thursday, October 12

09:00 - 10:30

SP6/S01: Mission-Critical Communications I

- Chair: Ayman Sabbah (Carleton University, Canada)
Room: St-Léonard
- 09:00 *Adaptive Synchronization Reference Selection for Out-Of-Coverage Proximity Services*
Samantha Gamboa, Fernando J. Cintrón and David Griffith (NIST, USA); Richard Rouil (National Institute of Standards and Technology, USA)
- 09:18 *Coverage Maximization for a Poisson Field of Drone Cells*
Mahdi Azari and Yuri Murillo (KU Leuven, Belgium); Osama Amin (King Abdullah University of Science and Technology (KAUST), Saudi Arabia); Fernando Rosas (Imperial College London & Centre of Complexity Science, United Kingdom (Great Britain)); Mohamed-Slim Alouini (King Abdullah University of Science and Technology (KAUST), Saudi Arabia); Sofie Pollin (KU Leuven, Belgium)
- 09:36 *A Dynamic Detecting Function Deployment in Unsafe Wireless Networks*
Feng Zhang, Yunkai Wei and Lixiang Ma (University of Electronic Science and Technology of China, P.R. China)
- 09:54 *Enabling LTE Emulation by Integrating CORE Emulator and LTE-EPC Network (LENA) Simulator*
Ayman Sabbah and Abdallah Jarwan (Carleton University, Canada); Omneya MK Issa (Communications Research Centre Canada, Canada); Mohamed Ibnkahla (Carleton University, Canada)
- 10:12 *Session Adjournment*

13:30 - 15:00

SP6/S02: Mission-Critical Communications II

- Chair: Ayman Sabbah (Carleton University, Canada)
Room: St-Léonard
- 13:30 *Artificial-Noise-Aided Secure Communication with Full-Duplex Active Eavesdropper*
Zunning Liu, Na Li, Xiaofeng Tao, Si Li and Jin Xu (Beijing University of Posts and Telecommunications, P.R. China); Zhang Baofeng (China Information Technology Security Evaluation Center, P.R. China)
- 13:48 *On the Use of TEE for Mission Critical Public Safety Use Cases*
Ali Raza (Rochester Institute of Technology & Dubai Campus, United Arab Emirates)
- 14:06 *A Redundant Gateway Prototype for Wireless Avionic Sensor Networks*
Davide Scazzoli and Andrea Mola (Politecnico di Milano, Italy); Bilhanan Silverajan (Tampere University of Technology, Finland); Maurizio Magarini and Giacomo Verticale (Politecnico di Milano, Italy)
- 14:24 *Simulating Large-Scale Networks for Public Safety: Parallel and Distributed Solutions in NS-3*
Ismael Al-Shiab, Ayman Sabbah, Abdallah Jarwan and Mohamed Ibnkahla (Carleton University, Canada); Omneya MK Issa (Communications Research Centre Canada, Canada)
- 14:42 *Optimizing Power Allocation in Mission Critical Cognitive Radio Networks*
Ayman Sabbah and Mohamed Ibnkahla (Carleton University, Canada)

SP-02 Software-Defined Edge Computing in Smart Cities

Thursday, October 12

16:30 - 18:00

SP2: Software-Defined Edge Computing in Smart Cities

- Chair: Mohamed Cheriet (Ecole de technologie supérieure (University of Quebec, Canada)
Room: Jacques-Cartier
- 16:30 *Towards Efficient Monitoring in a Sensor Cloud*
Vojislav B. Mišić, Jelena Mišić and Fatemeh Banaie (Ryerson University, Canada)
- 16:48 *Optimized IoT Service Orchestration*
Duong Tuan Nguyen and Kim Khoa Nguyen (University of Quebec, Canada);

17:06 Mohamed Cheriet (Ecole de technologie superieure (University of Quebec), Canada)
An Agent-Based Model to Evaluate Smart Homes Sustainability Potential
Julien Walzberg (Polytechnique Montréal & CIRAI, Canada); Thomas Dan

17:24 dres and Réjean Samson (École Polytechnique de Montréal, Canada);
Nicolas Merveille (Université du Québec à Montréal, Canada); Mohamed Cheriet (Ecole de technologie superieure (University of Quebec), Canada)
Session Adjournment

DEMO SESSIONS

DS1: Demo Exhibits I

Tuesday, October 10, Mont-Royal

09:00 - 10:30

- DE/S01/E1: *An Experimental Validation of M-QAM/M-PSK Demodulations Using 60 GHz Six-port Front-end Receiver for Short-range Indoor Wireless Applications*
Chaouki Hannachi and Serioja Tatu (INRS, University of Quebec, Canada)
- DE/S01/E2: *Smart Streetlights: Energy Saving, Safety and Reduced GHG Emissions*
Tayeb Medjeldi and Jean-François Viens (Centre collégial de transfert de technologie en télécommunications, Canada)
- DE/S01/E3: *TrafficM2Modelling.com: a web application for traffic characterization and LTE performance analysis of M2M traffic*
Filippo Malandra (McGill University, Canada) and Brunilde Sansò (Polytechnique Montreal, Canada)

DS2: Demo Exhibits II

Tuesday, October 10, Mont-Royal

16:30 - 18:00

- DE/S02/E1: *Versatile Module for Connecting Sensors via Low Power Wide Area Network (LPWAN)*
Guus Leenders, Gilles Callebaut, Geoffrey Otttoy and Liesbet Van der Perre (ESAT, Dramco, Ghent, Belgium)
- DE/S02/E2: *Real-Time SEFDM Transceiver for 5G Systems and Beyond*
Waseem Ozan, Ryan Grammenos, Hedaia Ghannam, Paul Anthony Haigh and Izzat Darwazeh (University College London, UK)
- DE/S02/E3: *Demonstration of Wireless Power and Data Transfer via Magnetic Coupling and RF Propagation in the Presence of Obstacles for Mobile Applications*
Hüseyin U. Aydogmus (Yildiz Technical University, Turkey), Hakan P. Partal (Syracuse University, USA) and Sibel Zorlu-Partal (Radarcomm, LLC, Turkey)

DS3: Demo Exhibits III

Wednesday, October 11, Mont-Royal

09:00 - 10:30

- DE/S03/E1: *Real-Time and Over-The-Air STAR-Based Time-Delay Estimation for Geolocation in Underground Mines*
Haithem Haggui (INRS, University of Quebec, Canada), Faouzi Bellili (University of Toronto, Canada) and Sofiene Affes (INRS, University of Quebec, Canada)

- DE/S03/E2: *i-Safe: A Driver Behavior Monitoring and Warning System Based on the Internet of Vehicles*
Lien-Wu Chen and Hsien-Min Chen (Feng Chia University, Taiwan)
- DE/S03/E3: *Demonstrator of KPI Analytics for Anomaly Detection and Diagnosis in Mobile Networks*
Levente Bodrog (Nokia Bell Labs, Hungary), Marton Kajo (Technical University of Munich, Germany), Szilard Kocsis (Nokia Bell Labs, Hungary) and Benedek Schultz (Nokia Bell Labs, Hungary)

DS4: Demo Exhibits IV

Wednesday, October 11, Mont-Royal

16:30 - 18:00

- DE/S04/E1: *Real-World Evaluation of Localization Algorithms for Wireless Sensor Networks*
Mohamed Guadane, Abdelaziz Samet and Sofiene Affes (INRS, University of Quebec, Canada)
- DE/S04/E2: *Real-Time and Over-The-Air Joint DA ML SNR and Doppler Spread Estimator For 5G Cognitive Transceivers*
Haithem Haggui (INRS, University of Quebec, Canada), Yassine Selmi (INRS, University of Quebec, Canada), Faouzi Bellili (University of Toronto, Canada) and Sofiene Affes (INRS, University of Quebec, Canada)
- DE/S04/E3: *An End-to-end Testbed Implementation for IoT Applications using IPv6 over IEEE 802.15.4*
Diandi Zhu (TIPoT Technologies Inc., Canada), Qianjun Tang (TIPoT Technologies Inc., Canada), Zhipeng Wang (TIPoT Technologies Inc., Canada), Ting Yu (TIPoT Technologies Inc., Canada) and Abdelhakim Hafid (Network Research Laboratory, University of Montreal, Canada)

DS5: Demo Exhibits V

Thursday, October 12, Mont-Royal

9:00 - 10:30

- DE/S05/E1: *An Android Application for Opportunistic Alert Diffusion in Disaster Scenario*
Farouk Mezghani (Inria Lille Nord, France), Vincent Bardol (Spotrotter, France), Nathalie Mitton (Inria Lille Nord, France) and Jean-Louis Laporte (Spotrotter, France)
- DE/S05/E2: *System-Level Simulator for Future 5G networks*
Slim Zaidi, Raouia Nasri, and Sofiene Affes (INRS, University of Quebec, Canada)
- DE/S05/E3: *Demo Presentation by ROHDE & SCHWARZ*
Mathieu Caillet and Robert Olszak



L.O.R.I.

LEADER OF RADICAL INNOVATION



Technology takes people, too.

At Cogeco Peer 1 we power the potential of our customers. With managed services spanning cloud, hosting, colocation, connectivity and security, we offer managed hybrid IT solutions paired with genuine choice and flexibility, international reach, deep technical expertise and unshakeable human support.

Because technology takes people, too.

cogecopeer1.com

BIOGRAPHIES OF PROGRAM ORGANIZERS AND GUESTS



Taimoor Abbas, Volvo Cars, Sweden

Taimoor Abbas is connect vehicle technology expert at Volvo Car Corporation, Sweden, since 2014. He earned his Ph.D. degree in radio systems and M.S. degree in wireless communications from the department of Electrical and Information Technology, Lund University, Sweden, in 2014 and 2009, and M.Sc. degree in electronics from Quaid-i-Azam University Islamabad, Pakistan, in 2006. During 2008-2009, he has been with Ericsson Research for his master thesis internship. He is actively participating in EU 5GCAR project, ETSI and 5GPPP towards ITS-G5 and 5G V2X research and standardization. His research areas include V2X communication, MIMO systems, 5G for automotive, and, radio channel measurement and modelling.



Ibrahim Abualhaol, Larus Technologies and Carleton University, Canada

Research Scientist at Larus Technologies and an Adjunct Research Professor at Carleton University in Ottawa, Canada. He holds a BSc, an MSc, and a Ph.D. in Electrical and Computer Engineering. He is a senior member of IEEE and a Professional Engineer (P.Eng) in Ontario, Canada. His research interests include real-time big-data analytics and its application on the Internet-of-Things, cybersecurity, and wireless communication networks. Ibrahim has an excellent knowledge and hands-on experience in machine learning modeling and real-time Big Data analytics. This includes: (i) Python programming (Data analysis and mining with pandas, visualization with matplotlib and seaborn, machine learning with Scikit-learn, and natural language processing with NLTK), (ii) Databases (MySQL, MongoDB, and Cassandra) (iii) Real-time Big Data analytics (PySpark, Kafka, and Cassandra).



Sofiène Affes, INRS, Canada

Sofiène Affes received the Diplôme d'Ingénieur degree in telecommunications and the Ph.D. degree (Hons.) in signal processing from the École Nationale Supérieure des Télécommunications, Paris, France, in 1992 and 1995, respectively. He was a Research Associate with INRS, Montreal, QC, Canada, until 1997, an Assistant Professor until 2000, and an Associate Professor until 2009. He is currently a Full Professor and Director of PERSWADE, a unique U.S. \$4M research training program on wireless in Canada involving 27 faculty members from 8 universities and 10 industrial partners. From 2003 to 2013, he was a Canada Research Chair in Wireless Communications. He has been a recipient of a Discovery Accelerator Supplement Award twice from NSERC, from 2008 to 2011 and from 2013 to 2016. He is an Associate Editor for the IEEE Transactions on Communications and the Journal on Wireless Communications and Mobile Computing (Wiley). He was previously an Associate Editor for the IEEE Transactions on Wireless Communications and the IEEE Transactions on Signal Processing. He already served as a General Co-Chair of the IEEE VTC'2006-Fall and the IEEE ICUWB 2015, both held in Montreal, QC, Canada. For his contributions to the success of both events, he received a Recognition Award from the IEEE Vehicular Technology Society in 2008 and a Certificate of Recognition from the IEEE Microwave Theory and Techniques Society in 2015. He is currently serving as the General Chair of 28th IEEE PIMRC to be held in Montreal in the fall 2017.



Hamid Aghvami, King's College, UK

Hamid Aghvami joined the academic staff at King's in 1984. In 1989 he was promoted to Reader, and in 1993 was promoted Professor in Telecommunications Engineering. He was the Director of the Centre for Telecommunications Research at King's from 1994 to 2014. Professor Aghvami carries out consulting work on Digital Radio Communications Systems for British and International companies; he has published over 550 technical journal and conference papers, and given invited talks and courses the world over on various aspects of Personal and Mobile Radio Communications. He was Visiting Professor at NTT Radio Communication Systems Laboratories in 1990, Senior Research Fellow at BT Laboratories in 1998-1999, and was

an Executive Advisor to Wireless Facilities Inc., USA, in 1996-2002. He is the Chairman of Advanced Wireless Technology Group Ltd. He is also the Managing Director of Wireless Multimedia Communications Ltd, his own consultancy company. Professor Aghvami leads an active research team working on numerous mobile and personal communications projects for Fourth and fifth generation networks; these projects are supported both by government and industry. He was a member of the Board of Governors of the IEEE Communications Society in 2001-2003, was a Distinguished Lecturer of the IEEE Communications Society in 2004-2007, and has been member, Chairman, and Vice-Chairman of the technical programme and organising committees of a large number of international conferences. He is also founder of the International Symposium on Personal Indoor and Mobile Radio Communications (PIMRC), a major yearly conference attracting some 1,000 attendees. Professor Aghvami was awarded the IEEE Technical Committee on Personal Communications (TCPC) Recognition Award in 2005 for his outstanding technical contributions to the communications field, and for his service to the scientific and engineering communities. Professor Aghvami is a Fellow of the Royal Academy of Engineering, Fellow of the IET, Fellow of the IEEE, and in 2009 was awarded a Fellowship of the Wireless World Research Forum in recognition of his personal contributions to the wireless world, and for his research achievements as Director at the Centre for Telecommunications Research at King's.



Saad Ahmad, InterDigital, Canada

Saad Ahmad is a Staff Engineer at InterDigital in the 3GPP Standards department. The focus of his research is advanced wireless network technologies for 5G Wireless Core Network design. He is currently leading the 5G Core Network system design research and standardization efforts at InterDigital. Previously, Saad has actively contributed to designing of Enhanced Packet Core (EPC) network for LTE and LTE-A technologies specializing in NAS layer aspects. He is listed as an inventor on over 15 granted US patents and 50 patent applications. Saad received his M.Eng degree from McGill University, Montreal, Canada in 2013. He also received an MBA degree from McGill University, Montreal, Canada in 2016.



Hamed Ahmadi, University College Dublin, Ireland

Hamed Ahmadi is a lecturer at University College Dublin, Ireland. He received his B.Sc. degree in computer engineering from Ferdowsi University of Mashhad, Mashhad, Iran, in 2004, M.Sc. degree in software engineering from National Aerospace University of Kharkiv (KhAI), Kharkiv, Ukraine, in 2008, and Ph.D. in electrical engineering from National University of Singapore (NUS) in 2012. He worked as a research fellow at CONNECT/CTVR centre, Trinity College Dublin in 2012-2015. Dr. Ahmadi's current research interests include design, analysis, and optimization of wireless communications networks, cognitive radio networks, and the application of machine learning in small cell and self-organizing networks. Dr. Ahmadi is serving several international journals as a reviewer as well as being part of several Technical Programme Committees at different worldwide conferences/congresses. In 2013, Dr. Ahmadi was selected as an exemplary reviewer of IEEE Communications Letters.



Siavash Alamouti, mimik, Canada

Siavash Alamouti is a pioneer and thought leader in open mobile internet. His inventions and industry initiatives have touched everyone globally. His space-time block code (known as Alamouti code) is used in over 10 billion devices. His contributions to the adoption of OFDMA/MIMO in 4G with Mobile WiMAX led to a more open international standard with LTE. He is the visionary behind the WiGig Alliance and inclusion of mmWave technology in the WiFi Alliance Roadmap. Close to 20,000 citations to-date in Google Scholar is an indicator of his level impact on the modern technology landscape. His passionate lobbying for spectrum reform with FCC in the US and globally at ITU opened the path for the adoption of smart antenna and OFDMA technologies in the unlicensed and licensed bands in the US and eventually globally. He is an advocate of decentralized power in business, society, and technology and believes that decentralization is a key factor to ensure a sustainable global ecosystem. In the

last few years, he has been quietly focused on enabling distributed edge cloud to help democratize personal data and decentralization of “cloud” and its extension to the edge. Before joining mimik as President & CEO, he was the Group R&D Director at Vodafone in London, UK where he managed R&D, corporate venture, and intellectual property for the entire group. Prior to Vodafone, he was an Intel Fellow and CTO of the Mobile Wireless Group. Before Intel, Alamouti was the CTO at the start up Vivato and prior to that had senior technology roles in Cadence Design Systems, AT&T Wireless Services, McCaw Cellular, and MPR Teltech Ltd.



Muquid Ali, AWTG Limited, United Kingdom

Muquid Ali is currently the VP of Operation at AWTG Limited. He is a telecommunications expert with 22 years industry experience in the design, roll-out and quality of service improvement of wired and wireless networks across all major technology standards including 2G, 3G and LTE. Muquid has a proven track record in technical project management with a broad range of experience in the end to end mobile network life-cycle. This includes new network roll-out, upgrades and

technology refresh across a wide spectrum of projects and roles spanning Europe, Asia, Middle East and Africa. Working with the 5GIC at the University of Surrey, Muquid has recently delivered the ‘first of its kind in the world’ comprehensive end to end 5G test-bed including a 44 site RAN, full equalised latency fibre backhaul and core network. The 5G innovation centre is using the network to help develop new technologies and standards that will be needed to deliver the next generations of networks beyond LTE. Muquid has worked on the planning, delivery and service improvement of all the UK’s main mobile operator networks and has a significant amount of experience in the trailing, testing and validation of new technologies and standards. His experience includes working on the delivery and acceptance of the first 3G trail networks in the UK as well as the delivery and acceptance of a number of LTE networks. Muquid was also responsible for the compliance testing and performance validation of the vendor equipment against the 3GPP LTE standards and specification. During the recent UK National Audit Office review into the Home Office’s Emergency Services Network replacement programme, Muquid was engaged as a subject matter expert to provide technical guidance, review and appraisal of the programme objectives, deliverables, project plan and contractual arrangements. Muquid delivered a wide ranging assessment of the key technical challenges, risks and mitigation strategies and the report has since been submitted to parliament. Muquid’s experience covers all the major industry suppliers and operators and he has served as a subject matter expert to a wide range of international clients such as the Department for Economy (DfE) in Northern Ireland, the GSMA, major equipment vendors and retail clients such as Tesco.



Ala Abu Alkheir, University of Ottawa, Canada

Ala Abu Alkheir has earned his BSc and MSc in Electrical Engineering from the Jordan University of Science and Technology in 2004 and 2006, respectively. Between 2007 and 2008, he was with the Department of Electrical and Computer Engineering at Texas A&M University in Qatar as a research and teaching associate. In 2008, he joined the Department of Electrical and Computer Engineering at Queen’s University as a PhD student working in the areas of wireless sensor network

and cognitive radio networks. After finishing his PhD in 2013, Ala joined the School of Electrical Engineering and Computer Science at the University of Ottawa as a postdoctoral fellow. His research interests are in cognitive radio networks, wireless sensor networks, smart grids, vehicular networks, and the internet of things.



Amira Alloum, Nokia Research Labs, France

Amira Alloum is a Member of the technical staff of Bell Laboratories within the mathematics of complex & dynamic networks group where her major focus is on error correcting codes applications for wireless communication (5G NR), privacy and security field (Post Quantum Security with Coding) on both Transmission and Computer Science perspectives. Prior to joining Bell Labs, She was a member of the physical layer specification team of the LTE enode-B within Alcatel-

Lucent wireless division; contributed in the design of the upper layer forward error correction scheme of the DVB-SH standard within INRIA –Bell Labs joint laboratories; and

held research projects and studies in the field of iterative decoding algorithms for graph based codes and turbo codes under grants and tight collaborations with Orange Labs, CNES and UTAH university. Amira served as well in several international companies and research institutions including: Siemens, Citibank, Unesco, Orange Labs, CNES, INRIA, Alcatel-Lucent and Nokia Bell Labs. Currently her focus is on the lead and contribution in research projects involving: Unconditional Security using Algebraic Coding for Cloud Services (Access, Storage and Computing), Channel Coding Schemes for Random Access and Transmission of Short Packets for 5G 3GPP Standard and related 5G IoT applications.



Slim Alouini, KAUST, Saudi Arabia

Mohamed-Slim Alouini 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.



Ahmed Alsohaily, TELUS, Canada

Ahmed Alsohaily is the Assistant Director of the Wireless Lab, University of Toronto, and a Member of the 5G Spectrum and Wireless Networks Team at TELUS. He is also an adviser for the Next Generation Mobile Networks (NGMN) alliance and actively contributes to 3GPP, ITU and the IEEE ComSoc Standards Development. Ahmed received his Bachelors of Engineering from King Saud University and both his Masters of Engineering and PhD in Engineering from the University of Toronto.



Emad Alsusa, University of Manchester, UK

Emad Alsusa (M’06–SM’07) received the Ph.D. degree in electrical and electronic engineering from Bath University, Bath, U.K., in 2000. He then joined the School of Engineering and Electronics, Edinburgh University, Edinburgh, U.K., as a MobileVCE Postdoctoral Research Fellow, working on link enhancement techniques for future high-data rate wireless communication systems. In 2003, he joined the University of Manchester, Manchester, U.K., as an Academic Member of the

School of Electrical and Electronic Engineering, where he lectures on communication engineering subjects. His research interests include signal processing techniques and the analysis of wireless communication networks, with particular focus on cognitive radio, interference mitigation, multiuser multiple-input–multiple-output, Green communications, and energy and spectrum optimization techniques. Dr. Alsusa has served as a Technical Program Committee member on numerous IEEE flagship conferences and chaired the Manchester EEE postgraduate conference in 2010.



Jennifer Andreoli-Fang, CableLabs, USA

Jennifer Andreoli-Fang is a Distinguished Technologist in the OCTO and R&D group at CableLabs in Boulder, Colorado. Jennifer joined CableLabs in 2007, and has led the development of several key technologies for the cable industry. She is currently leading the innovations on fixed mobile convergence, unlicensed LTE, as well as the multi-vendor team for the development of full duplex DOCSIS MAC and upper layers. She led the development of DOCSIS 3.1 MAC specification, and the

evolution of the DOCSIS 3.0 MAC. Jennifer is actively involved in research and development of both fixed and mobile broadband communication systems. She has 48 patents issued or pending. Prior to joining CableLabs, she held positions in the wireless and satellite industry. Jennifer received the Ph.D. degree in Electrical and Computer Engineering from the University of California, San Diego in 2005, and the Bachelor of Science degree in Electrical Engineering from the California Institute of Technology in 1998.



Masoud Ardakani, University of Alberta, Canada

Masoud Ardakani received the Ph.D. degree from the University of Toronto, Canada, in 2004. He was a Postdoctoral fellow at the University of Toronto from 2004 to 2005. He is currently a Professor of Electrical and Computer Engineering at the University of Alberta, Canada. His research interests are in the general area of information and communication theory. Dr. Ardakani serves as an Associate Editor for the IEEE TRANSACTIONS ON COMMUNICATIONS and has served as an Associate Editor for the IEEE WIRELESS COMMUNICATIONS and as a senior editor for the IEEE COMMUNICATION LETTERS.



Chadi Assi, Concordia Univ., Canada

Chadi Assi (SM'08) received the B.Eng. degree from the Lebanese University, Beirut, Lebanon, in 1997 and the Ph.D. degree from the City University of New York (CUNY), New York, NY, USA, in 2003. He is currently a Full Professor with the Concordia Institute for Information Systems Engineering, Concordia University, Montreal, QC, Canada. Before joining Concordia University, he was a Visiting Researcher with Nokia Research Center, Boston, MA, USA, where he worked on quality of service in passive optical access networks. His main research interests include networks and network design and optimization. His current research interests include network design and optimization, network modeling, and network reliability. Dr. Assi is on the Editorial Board of the IEEE COMMUNICATIONS SURVEYS AND TUTORIALS, IEEE TRANSACTIONS ON COMMUNICATIONS, and IEEE TRANSACTIONS ON VEHICULAR TECHNOLOGY. He was a recipient of the prestigious Mina Rees Dissertation Award from CUNY in August 2002 for his research on wavelength-division multiplexing optical networks.



Mohammed Atiquzzaman, University of Oklahoma, USA

Mohammed Atiquzzaman received the MS and PhD degrees in electrical engineering and electronics from the University of Manchester. He is currently a professor in the School of Computer Science at the University of Oklahoma. He is the editor-in-chief of the Journal of Networks and Computer Applications, editor-in-chief of Vehicular Communications, and serves on the editorial boards of IEEE Communications Magazine, International Journal on Wireless and Optical Communications, Real Time Imaging Journal, Journal of Communication Systems, Communication Networks and Distributed Systems, and the Journal of Sensor Networks. He received the Edith Kinney Gaylord Presidential Professorship for meeting the highest standards of excellence in scholarship and teaching at the University of Oklahoma. In recognition of his contribution to NASA research, he received the NASA Group Achievement Award for "outstanding work to further NASA Glenn Research Center's effort in the area of Advanced Communications/Air Traffic Management's Fiber Optic Signal Distribution for Aeronautical Communications" project. He is the coauthor of the book Performance of TCP/IP over ATM Networks and has more than 325 refereed publications, available at <http://www.cs.ou.edu/~atiq>. His research interests are in wireless and mobile networks, ad hoc networks, and satellite networks. His research has been funded by the US National Science Foundation (NSF), National Aeronautics and Space Administration (NASA), US Air Force, and Cisco through grants totaling over \$10M. He is a senior member of the IEEE.



Moussa Ayyash, Chicago State University, USA

Moussa Ayyash is a Professor at Chicago State University. He has his PhD in Electrical and Computer Engineering. He serves as the PI/co-PI of several NSF, NSA, and DoD funded projects. His research interests are related to RF and optical networks, Internet of things, and network security. Dr. Ayyash is a senior IEEE member and a member of ACM.



Kareem Baddour, Communications Research Centre, Canada

Kareem E. Baddour received the M.Sc. and Ph.D. degrees in electrical engineering at Queen's University in Kingston, Canada in 1998 and 2005, respectively. Since 2006, he has been a Research Scientist at the Communications Research Centre Canada in Ottawa. His research interests cover the broad area of signal processing for wireless communications with a current focus on dynamic spectrum access networks. He has published numerous articles in these areas in peer-reviewed journals and international conferences and was the co-recipient of a best paper award at the International Symposium on Wireless Communication Systems (ISWCS) 2010. He was a Guest Editor of the Elsevier PHYCOM journal's special issue "Cognitive Radio: The Road for its Second Decade" in Nov. 2013. Kareem Baddour has contributed in various international research fora (e.g. COST Action IC-0902, TTCP, WUN COGCOM). He regularly serves on the Technical Program Committees of major international communications conferences (IEEE ICC, Globecom, VTC) and has served as a reviewer for various journals (IEEE Transactions on Wireless Communications, IEEE Transactions on Communications, IEEE Transactions on Vehicular Technology). He was a co-chair of the Cognitive Radio and Spectrum Sensing Track of IEEE VTC Fall 2012 in Montreal, Canada, and also was a co-organizer of the CRAFT Workshops from 2013-2016.



Faouzi Bader, Centrale Supélec, France

Faouzi Bader (SM'07) received his PhD degree (with Honours) in Telecommunications in 2002 from Universidad Politécnica de Madrid (UPM), Madrid, Spain. He joined the Centre Technologique de Telecomunicaciones de Catalunya (CTTC) in Barcelona Spain as Associate researcher in 2002, and nominated in 2006 Senior Research Associate at same institution. Since June 2013, he is as Associate Professor at Centrale Supélec in Rennes, France. His research activities mainly focus on advanced multi-carrier waveforms (OFDM(A), (non-) uniform multimode filter based multicarrier schemes) and frequency allocation techniques in relay cognitive environment. He has been involved in several European projects from the 5th-7th EC research frameworks, and from 2012-2013 he was nominated general coordinator and manager of the EC funded research project ICT "EMPhAtiC" focusing on "Enhanced Multicarrier Techniques for Professional Ad-Hoc and Cell-Based Communications". He has published over 120 papers in peer-reviewed journals and international conferences, more than 13 book chapters, and published 3 books. He served as Technical Program Committee member in major IEEE ComSoc and VTS conferences, and as the general chair of the eleventh edition of the ISWCS'2014 conference, and the co-chair of the ISWCS 2015 edition. He is IEEE Senior Member from 2007.



Wafae Bakkali, Centrale Supélec and Sagemcom, France

Wafae Bakkali has been a postdoctoral researcher in Centrale Supélec and Sagemcom, France since June 2016. She received the Ph.D. degree from Telecom Bretagne, Brest, France in December 2015 and the Engineer Degree from the National School of Applied Sciences of Tangier, Morocco in 2012. During her Ph.D., she was a visiting researcher at EcoSys Lab in the University of Klagenfurt, Austria. From 2013 to 2016, she was an R&D Engineer at Orange Labs, Lannion, France where she worked on the development of power reduction techniques for the Power Line Communications Technology and contributed to the French research project FUI14 GREENCoMM. Her research interests include advanced power line communications, power optimisation techniques and geolocation for Internet of Things LoR WAN devices.



Jean-Claude Belfiore, Huawei Technologies, France

Jean-Claude Belfiore is Head of the Communication Science Department at the Huawei Mathematical and Algorithmic Sciences Lab and professor at Telecom ParisTech. He received his MSc from Supélec and his PhD from ENST. In 1989, he was enrolled at ENST (now Telecom ParisTech), where he became full Professor in the Communications & Electronics department, in charge of research activities in the areas of digital communications, information theory and coding. Jean-Claude Belfiore has made pioneering contributions on modulation and coding for wireless

systems (especially space-time coding) by using tools of number theory. He is also one of the co-inventors of the celebrated Golden Code. He is now working on wireless network coding, coding for physical security, coding for interference channels and more generally on lattice coding problems for multi-terminal communications. He is author or co-author of more than 200 technical papers and communications and he has served as advisor for more than 30 Ph.D. students. Prof. Belfiore has been the recipient of the 2007 Blondel Medal. He has been Associate Editor of the IEEE Transactions on Information Theory for Coding Theory.



Souheib Ben Amor, INRS, Canada

Souheib Ben Amor received the Dipl.Ing. degree in telecommunications from the National Engineering School of Tunis in 2013 and the M.Sc. degree from the Institut National de la Recherche Scientifique-Énergie, Matériaux, et Télécommunications (INRS- EMT), Université du Québec, Montréal, QC, Canada, in 2016, where he is currently pursuing the Ph.D. degree, with a focus on statistical signal processing and array processing and their applications in wireless communications.

He received a scholarship for the M.Sc. degree under an agreement between the Tunisian government and INRS-ÉMT.



Khaled Ben Letaief, HKUST, Hong Kong, and HBKU, Qatar

Khaled Ben Letaief received his Ph.D. from Purdue University, USA. He is Chair Professor and Provost of HBKU, a newly established research-intensive university in Qatar. He has served as HKUST Dean of Engineering from 2009 to 2015. Under his leadership, HKUST School of Engineering has not only transformed its education and scope and produced very high caliber scholarship, it has also actively pursued knowledge transfer and societal engagement in broad contexts. It

has also dazzled in international rankings. Dr. Letaief is a world-renowned leader in wireless communications and networks. In these areas, he has over 500 journal and conference papers and given invited keynote talks as well as courses all over the world. He has made 6 major contributions to IEEE Standards along with 13 patents. He is the founding Editor-in-Chief of IEEE Transactions on Wireless Communications and was instrumental in organizing many IEEE flagship conferences as well as serving IEEE in many leadership positions, including IEEE ComSoc Vice-President for Technical Activities and IEEE ComSoc Vice-President for Conferences. He is recipient of 6 Teaching awards and 11 IEEE Best Paper awards. He is ISI Highly Cited Researcher, IEEE Fellow, HKIE Fellow, and recipient of 2007 IEEE Joseph LoCicero Award; 2009 IEEE Marconi Prize Award; 2010 Purdue Outstanding Electrical and Computer Engineer Award, 2011 IEEE Harold Sobol Award, and 2011 IEEE Wireless Communications Technical Committee Recognition Award.



Mustapha Benjillali, INPT, Morocco

Mustapha Benjillali (S'04-M'09-SM'14), received the Ph.D. degree in telecommunications from INRS, Montreal, QC, Canada, in 2009. He was a Postdoctoral Research Fellow with the Electrical Engineering Program, Division of Physical Sciences and Engineering, King Abdullah University of Science and Technology (KAUST), Thuwal, KSA. He is now an Associate Professor of Wireless Communications with the Communication Systems Department at INPT, Rabat, Morocco. His current

research interests are in the area of 5G wireless and mobile communications. His focus is on the design of physical and link layers, closed-form mathematical performance analysis, energy-efficiency, and resource allocation strategies.



Nik Bessis, Edge Hill University, UK

Nik Bessis is a full Professor of Computer Science and the Head of the Department of Computer Science at Edge Hill University, UK. Prior to that, Nik was a full Professor of Computer Science and the Director of Distributed and Intelligent Systems (DISYS) research centre at the University of Derby, UK. He holds a PhD and a MA from De Montfort University, UK and a BA from TEI of Athens, Greece. Professor Bessis is a Fellow of HEA, BCS and a Senior Member of IEEE. His research is on

social graphs for network and big data analytics as well as on developing data push and

resource provisioning services in IoT, FI and clouds. He runs a number of research initiatives with several Universities including ETH, Lanzhou, ATEI Crete, etc. He has led several projects worth over £3m. He has published over 250 works and won 4 best paper awards. He has chaired over 40 international events, delivered 4 keynote speeches, edited 4 SIs, 8 books and 9 conference proceedings. His latest 2 edited books on IoTs & big data have been ranked as top 25 & top 40 on Amazon AI book lists. He is also the founding editor-in-chief of IJST. Professor Bessis has served as an expert evaluator for the Hellenic QAA and, as an assessor for more than 10 Professorships conferment worldwide.



Vijay Bhargava, UBC, Canada

Vijay Bhargava was born in Beawar, India, in 1948. He came to Canada in 1966 and received the B.A.Sc., M.A.Sc., and Ph.D. degrees from Queens University, Kingston, in 1970, 1972, and 1974, respectively. He was with the Indian Institute of Science from 1974 to 1975, the University of Waterloo in 1976, Concordia University from 1976 to 1984, and the University of Victoria from 1984 to 2003. He served as the Head of the Department of Electrical and Computer Engineering, University of

British Columbia, Vancouver, from 2003 to 2008, where he is currently a Professor. He has held visiting appointments with the École Polytechnique de Montréal, the NTT Research Laboratory, the Tokyo Institute of Technology, the University of Indonesia, the Hong Kong University of Science and Technology, and Tohoku University. He is an Honorary Professor with UESTC, Chengdu, and the Gandhi Distinguished Professor, IIT Bombay. He was on sabbatical leave with the Friedrich Alexander University, Erlangen, Germany, from 2015 to 2016. He is in the Institute for Scientific Information highly cited list. He served as the Founder and the President of Binary Communications Inc., from 1983 to 2000. He is a co-author (with D. Haccoun, R. Matyas, and P. Nussli) of Digital Communications by Satellite (New York: NY, USA: Wiley, 1981), which was translated into Chinese and Japanese. He is a co-editor (with S. Wicker) of Reed Solomon Codes and their Applications (IEEE Press: 1994), a co-editor (with H.V. Poor, V. Tarokh and S. Yoon) of Communications, Information and Network Security (Kluwer: 2003) a coeditor (with E. Hossain) of Cognitive Wireless Communication Networks (Springer: 2007), a co-editor (with E. Hossain and D.I Kim) of Cooperative Wireless Communications Networks (Cambridge University Press: 2011) and a co-editor (with E.Hossain and G. Fettweis) of Green Radio Communications Networks (Cambridge University Press 2012). Dr. Bhargava is a Fellow of The Royal Society of Canada, The Canadian Academy of Engineering, and the Engineering Institute of Canada. He is a Foreign Fellow of the National Academy of Engineering, India. He has served as the Distinguished Visiting Fellow of the Royal Academy of Engineering, U.K. He has received awards for his teaching, research, and service to the IEEE. His most recent awards are the Killam Prize in Engineering and the Humboldt Research Prize. He has served on the Board of Governors of the IEEE Information Theory Society and the IEEE Communications Society. He has held important positions in these societies. He has served as an Associate Editor of the IEEE TRANSACTIONS ON COMMUNICATIONS. He played a major role in the creation of the IEEE Wireless Communications and Networking Conference (WCNC) and the IEEE TRANSACTIONS ON WIRELESS COMMUNICATIONS, for which he served as the Editor-in-Chief from 2007 to 2009. He was the President of the IEEE Information Theory Society and the President of the IEEE Communications Society.



Valerio Bioglio, Huawei Technologies, France

Valerio Bioglio has joined the Huawei French Research Centre in January 2015 as Researcher for the Team Coding for Data Networks. Previously he joined the CRISP Team as a Post-doc Researcher at the Telecommunication Department, Politecnico di Torino. He obtained his BSc in Mathematics from Università degli Studi di Torino (Italy) in 2006. He obtained her MSc in Applied Mathematics from Università degli Studi di Torino (Italy) in 2008. He completed his PhD in Computer Science at

the Computer Science Department of the Università degli Studi di Torino (Italy) in 2012. His main research interests are information theory, communication theory and signal processing with focus on mathematical modeling. His publications include papers on rateless codes, network coding, P2P streaming, game theory for cooperative communications, codes for caching and distributed storage, compressed sensing, image processing. He further has extensive experience in student supervision, teaching and scientific vulgarisation. His current research interests lie in the field of 5G communication systems, with application to distributed storage, caching, and polar codes.



Mate Boban, Huawei Technologies Duesseldorf GmbH, Germany

Mate Boban is a Principal Research Engineer at Huawei German Research Center, Munich. He earned his Ph.D. degree in electrical and computer engineering from Carnegie Mellon University and his diploma in Informatics from University of Zagreb. Before joining Huawei, he worked for NEC Labs Europe, Carnegie Mellon University, and Apple. He is an alumnus of the Fulbright Scholar Program. He is a co-chair of IEEE SmartVehicles Workshop (2016 & 2017 edition). He actively participates in 5GAA, ETSI, and 3GPP, contributing to 5G V2X research and standardization. His current research is in the areas of channel modeling and cross-layer protocol design for V2X communication systems. He received the Best Paper Award at the IEEE VTC Spring 2014 and at IEEE VNC 2014. More information can be found on his website <http://mateboban.net>.



Tadilo Endeshaw Bogale, INRS & Western University, Canada

Tadilo Endeshaw Bogale (S'09–M'14) received the B.Sc. degree in electrical engineering from Jimma University, Jimma, Ethiopia, in 2004, the M.Sc. degree in electrical engineering from Karlstad University, Karlstad, Sweden, in 2008, and the Ph. D. degree in electrical engineering from University Catholique de Louvain, Louvain la neuve, Belgium, in 2013. From 2004 to 2007, he was working in Ethio Telecom, Addis Ababa, Ethiopia. From January 2014 to October 2014, he was working as a Postdoctoral Researcher at the Institut National de la Recherche Scientifique (INRS), Montreal, QC, Canada. Since November 2014, he has been working as a Joint Postdoctoral Researcher with INRS and the University of Western Ontario, London, ON, Canada. He is currently working on assessing the potential technologies to enable the future 5G networks. Specifically, his research focuses on the exploitation of massive multiple-input multipleoutput (MIMO) and millimeter wave (mmWave) techniques for 5G networks. His research interests include hybrid analog-digital beamforming for massive MIMO and mmWave systems, pilot contamination reduction for multicell massive MIMO systems, spectrum sensing and resource allocation for cognitive radio networks, robust (nonrobust) transceiver design for multiuser MIMO systems, centralized and distributed algorithms, and convex optimization techniques for multiuser systems. He has organized a workshop on Cognitive Radio for 5G networks that is collocated in the International Conference on Cognitive Radio Oriented Wireless Networks and Communications (CROWNCOM) 2015 conference. Mr. Bogale was a Session Chair for the International Conference on Communications, Conference on Information Systems and Sciences, and the CROWNCOM conferences and NEWCOM workshop. He has also served as a Technical Program Committee member on different international conferences, such as Personal, Indoor and Mobile Radio Communications, CROWNCOM, and Vehicular Technology Conference. Recently, he has delivered a tutorial in PIMRC 2015 and VTC-Spring 2016 on the 5G network.



Zied Bouida, Carleton University, Canada

Zied Bouida received the Diplôme d'Ingénieur degree from École Supérieure des Communications de Tunis (Sup'Com), Tunis, Tunisia, in 2006, the M.Sc. degree in electrical engineering from Texas A&M University (TAMU), College Station, TX, USA, in 2009, and the Ph.D. degree in electrical engineering from Concordia University, Montreal, QC, Canada, in 2015. Currently, he is a Postdoctoral Research Associate with the ECE Department, Texas A&M University at Qatar, Doha, Qatar.

His research interests include cognitive radio systems, diversity techniques, and the performance analysis of wireless communication systems.



Stefano Buzzi, University of Cassino and Lazio Meridionale, Italy

Stefano Buzzi is currently an Associate Professor at the University of Cassino and Lazio Meridionale, Italy. He received the Ph.D. degree in Electrical and Computer Engineering from the University of Naples "Federico II" in 1999, and has had short-term research appointments at Princeton University, Princeton (NJ), USA in 1999, 2000, 2001 and 2006. He is a former Associate Editor of the IEEE Signal Processing Letters and of the

IEEE Communications Letters, while is currently serving as an Editor for the IEEE Trans-

actions on Wireless Communications. He is also a Member of the IEEE 5G Tech Focus Editorial Board. Dr. Buzzi's research interests are in the broad field of communications and signal processing, with emphasis on wireless communications and 5G systems. He has co-authored about 150 technical peer-reviewed journal and conference papers, and among these, the highly-cited survey paper "What will 5G be?" (IEEE JSAC, June 2014) on 5G wireless networks.



Doru Calin, Nokia, USA

Nokia Mobile Networks CTO in Murray Hill, NJ, USA. He has broad responsibilities for accelerating innovations in 5G, mobile network virtualization, mobile edge cloud computing, cloud based technologies, IoT and verticals. Dr. Calin serves also as an Adjunct Professor with Columbia University, New York City, as an Associate Editor of IEEE Communications Letters and as an Editorial Board Member of the Springer's Wireless Personal Communications International Journal. At Nokia he held a variety of positions in research, applied research, and management of research. He was a Technical Consultant with Bouygues Telecom, and a Senior Research Engineer with Motorola Research Labs, Paris. He holds 30 independent patents awarded in multiple countries, over 20 patents pending and has co-authored over 75 research publications. He is the recipient of an IEEE WCNC 2015 best paper award, IEEE Globecom 2013 HetNets Workshop best paper, two Bell Labs President's Gold Awards, four Bell Labs Teamwork awards and a Motorola 3GPP standards award. He received a Ph.D. (Hons.) degree in electrical and computer engineering from the University of Versailles and TELECOM Sud-Paris, France in 1998 and has been a Senior Member of IEEE since 2005.



Gilles Callebaut, KU Leuven, Belgium

Gilles graduated summa cum laude in 2016 and received the M.Sc. degree in engineering technology at KU Leuven campus Gent, Belgium. He is currently a member of DRAMCO, a research group which is focused on wireless and mobile communication systems. His main interests are Machine Type Communication (MTC), Internet of Things (IoT), low power embedded systems and everything mobile.



Juan Carlos Zúñiga, Sigfox, Canada

Juan Carlos Zúñiga is Senior Standardization Expert, currently leading the networking standardization activities at SIGFOX, a global IoT LPWAN Service Provider. He has contributed and held leadership roles in different standards fora, such as IEEE 802, IETF, ETSI and 3GPP. He is currently co-chair of the IETF Internet Area WG and he used to chair the IEEE 802 EC Privacy Recommendation SG. He has previously worked with InterDigital and Harris Communications in Canada, Nortel Networks in the UK, and Kb/Tel in Mexico. Juan Carlos received his engineering degree from the UNAM, Mexico, and his MSc from the Imperial College London, UK. He has several peer-reviewed publications and he has been guest editor for the IEEE Communications Magazine. Juan Carlos is inventor of over 50 granted patents.



Symeon Chatzinotas, University of Luxembourg, Luxembourg

Symeon Chatzinotas (MEng, MSc, PhD, SMIEEE) is currently Senior Research Scientist and Deputy Head of the research group SIGCOM in the Interdisciplinary Centre for Security, Reliability and Trust, University of Luxembourg and Visiting Professor at the University of Parma, Italy. In the past, he has worked in numerous R&D projects for the Institute of Informatics & Telecommunications, National Center for Scientific Research "Demokritos," the Institute of Telematics and Informatics, Center of Research and Technology Hellas and Mobile Communications Research Group, Center of Communication Systems Research, University of Surrey. He has received the M.Eng. in Telecommunications from Aristotle University of Thessaloniki, Greece and the M.Sc. and Ph.D. in Electronic Engineering from University of Surrey, UK in 2003, 2006 and 2009 respectively. He has authored more than 250 technical papers in refereed international journals, conferences and scientific books. His research interests are on multiuser information theory, cooperative/cognitive communications and wireless networks

optimization.



Mohamed Cheriet, ETS, Canada

Mohamed CHERIET received his B.Eng. from USTHB University (Algiers) in 1984 and his M.Sc. and Ph.D. degrees in Computer Science from the University of Pierre et Marie Curie (Paris VI) in 1985 and 1988 respectively. Since 1992, he has been a professor in the Automation Engineering department at the Ecole de technologie supérieure (University of Quebec), Montreal, and was appointed full professor there in 1998. His interests

include document image analysis, OCR, mathematical models for image processing, pattern classification models and learning algorithms, as well as perception in computer vision. Dr. Cheriet has published more than 250 technical papers in the field, and has served as chair or co-chair of the following international conferences: VI'1998, VI'2000, IWFHR'2002, ICFHR'2008, and ISSPA'2012.



Yang-Seok Choi, Intel, USA

Yang-Seok Choi received B.S. degree from Korea University, Seoul, South Korea in 1990, M.S.E.E. degree from Korea Advanced Institute of Science and Technology, Taejeon, South Korea, in 1992, and Ph.D. degree from Polytechnic University, Brooklyn, NY, in 2000, all in electrical engineering. He has been in industry for 25 years in AT&T Labs-Research, Samsung, National semiconductor and a start-up. He joined Intel in 2004 and led WiMAX PHY Standards development team. In

2013 he joined Intel Labs and is a manager leading Wireless Interference Technology team. He has been focusing on future wireless communications in Intel Labs. He holds 60+ U.S. patents.



Jaehoon Chung, LG Electronics, Korea

Jaehoon Chung is a principal research engineer at LG Electronics, Inc., where he is a leader of the R&D project for advanced wireless communication technologies. He received a B.S. from Yonsei University in 1997, and M.S.E.E. and Ph.D. degrees from Korea Advanced Institute of Science and Technology (KAIST) in 1999 and 2005, respectively. After joining LG Electronics in 2006, he has worked on 3GPP standardization by 2011 focusing on LTE & LTE-Advanced physical layer

technologies. Since 2012, he has been mainly leading technology R&D and technical vision/strategy design of company and government for 5G wireless communication. Also he has been working for physical layer design on 3GPP 5G NR standardization since 2016. His research interests include mmWave, massive MIMO, new waveform, NoMA, and full duplex radio technologies, and so on. He received the National Order of Scientific & Technical Merit (Presidential Citation) from Korea government in 2012. He is currently the vice chairman for global strategy committee in 5G Forum Korea, and holds more than 600 patents.



Luis M. Correia, Univ. Lisbon, Portugal

Luis M. Correia was born in Portugal, on 1958. He received the Ph.D. in Electrical and Computer Engineering from IST (Technical University of Lisbon) in 1991, where he is currently a Professor in Telecommunications, with his work focused in Wireless/Mobile Communications in the areas of propagation, channel characterisation, radio networks, traffic, and applications, with the research activities developed in the INOV-INESC institute. He has acted as a consultant for Portuguese mobile

communications operators and the telecommunications regulator, besides other public and private entities. Besides being responsible for research projects at the national level, he has been active in 27 ones within the European frameworks of RACE, ACTS, IST, ICT and COST (where he also served as evaluator and auditor), having coordinated two COST projects, and taken leadership responsibilities at various levels in many others. He has supervised more than 150 M.Sc. and Ph.D. students, having authored more than 350 papers in international and national journals and conferences, for which he has served also as a reviewer, editor, and board member, and edited 6 books. He has been part of 26 Ph.D. juries at the international level. He was part of the COST Domain Committee on ICT. He was the Chairman of the Technical Programme Committee of several major confer-

ences, and is part of several Steering Boards. He is part of the Expert Advisory Group and of the Steering Board of the European Net!Works platform, and was the Chairman of its Working Group on Applications.



Laura Cottatellucci, EURECOM, France

Laura Cottatellucci obtained Ph.D. from Technical University of Vienna, Austria (2006) and Master degree from La Sapienza University, Rome, Italy (1995). Specialized in networking at Guglielmo Reiss Romoli School (1996, Italy), she worked in Telecom Italia (1995-2000) as responsible of industrial projects. From April 2000 to September 2005 she worked as senior research in ftw Austria on CDMA and MIMO systems. She was research fellow in INRIA (Sophia Antipolis, France)

from October to December 2005 and at the University of South Australia, Australia in 2006. Since December 2006 she is assistant professor in Eurecom. Cottatellucci has given 18 invited lectures in 10 different European, Asian, and Oceanian countries. She was a scientific coordinator of the summer school on Game Theory and Telecommunications at Lake Como School of Advanced Studies, Campione d'Italia, Italy, in September 2014. Additionally, she has conceived and delivered tutorials in summer/winter schools on Random Matrix for Communications (Newcom summer school in Barcelona, Spain; Acorn spring school in Adelaide, Australia; elite master study course "Systems of Information and Multimedia Technology" at FAU, Erlangen, Germany), and on Game Theory and its Applications to Wireless Communications (University of Bologna, International Curriculum in Telecommunications Engineering, Bologna, Italy; Game Theory @ Universities of Milano, Milano, Italy; Summer school on Game Theory and Telecommunications, Campione d'Italia, Italy). Cottatellucci is currently Associate Editor for IEEE Transactions on Communications and IEEE Transactions on Signal Processing and served as a guest editor for EURASIP Journal on Wireless Communications and Networking (special issue on cooperative communications). Her research topics of interest are large system analysis and algorithm design for multiuser wireless communications and complex networks, random matrix theory, and game theory.



Keeley Crockett, Manchester Metropolitan University, UK

Keeley Crockett is a Senior Lecturer in Computing in the Department of Computer and Mathematics at Manchester Metropolitan University. She gained a BSc Degree (Hons) in Computation from UMIST in 1993, and a PhD in the field of machine learning from the Manchester Metropolitan University in 1998 entitled "Fuzzy Rule Induction from Data Domains". She also obtained a P.G.C.E from The University of Huddersfield in June 2000. Her main research interests include the areas of fuzzy

decision trees, rule induction, applications of fuzzy theory, biologically inspired algorithms, and data mining. She is author or co-author of more than 29 papers published in specialized journals and congress proceedings. She has also adapted and co-authored a book on Database Systems to be published January 2008. She is a member of the Intelligent Systems Group which has established a strong international presence in its research into Conversational Agents and Adaptive Psychological Profiling including an international patent on "Silent Talker". She currently has 6 PhD students (2 as Director of studies and 4 co-supervisions). She was also a lead investigator on a Teaching Company Scheme. She is a knowledge engineer and founding member of Convagent Ltd, a company set up in collaboration with Manchester Metropolitan University, which provides business rule automation with natural language interfaces using conversational agents. She is also involved in a second University spin off company Silent Talker Ltd. She is a committee member of the IEEE Women into Computational Intelligence Society and a full member of the IEEE Computational Intelligence Society and the IEEE Women In Engineering Society. She is also a full member of the Chartered Institute of Educational Assessors.



Angelo Cuffaro, XCellAir, Canada

Angelo Cuffaro shares a leading role in XCellAir's Engineering Operations with focus on the development of our Wi-Fi and LTE technology solutions. Prior to joining XCellAir, Angelo Cuffaro led InterDigital's research and system design for Dynamic Spectrum, Future Wireless Internet, and Security technologies, with particular focus in the Shared Spectrum solutions. He was involved in a wide range of projects, including leadership of 3G (HSPA) modem development, design and characterization of

3G TDD and FDD systems, design and implementation of 802.11 RRM, and coordination of the standards strategy for cognitive radio technologies. Prior to InterDigital, Angelo was employed by Ericsson Communications where he was a Systems Lead on both 2G and 3G technology development, which led to the first W-CDMA operation in the PCS band in North America. He holds both Bachelor and Master of Engineering degrees from Concordia University in Montreal, Canada. He is an inventor of 56 granted U.S. patents, and has been awarded several InterDigital and Ericsson awards for Innovation.



Daniel da Costa, UFC, Brazil

Daniel B. da Costa was born in Fortaleza, Ceará, Brazil, in 1981. He received the B.Sc. degree in Telecommunications from the Military Institute of Engineering (IME), Rio de Janeiro, Brazil, in 2003, and the M.Sc. and Ph.D. degrees in Electrical Engineering, Area: Telecommunications, from the University of Campinas, SP, Brazil, in 2006 and 2008, respectively. His Ph.D. thesis was awarded the Best Ph.D. Thesis in Electrical Engineering by the Brazilian Ministry of Education (CAPES) at

the 2009 CAPES Thesis Contest. From 2008 to 2009, he was a Postdoctoral Research Fellow with INRS-EMT, University of Quebec, Montreal, QC, Canada. Since 2010, he has been with the Federal University of Ceará, where he is currently an Assistant Professor. Prof. da Costa is currently Editor of the IEEE ACCESS, IEEE COMMUNICATIONS LETTERS, IEEE TRANSACTIONS ON VEHICULAR TECHNOLOGY, EURASIP JOURNAL ON WIRELESS COMMUNICATIONS AND NETWORKING, and KSII TRANSACTIONS ON INTERNET AND INFORMATION SYSTEMS. He has also served as Associate Technical Editor of the IEEE COMMUNICATIONS MAGAZINE. In the past, he served as the Lead Guest Editor and Guest Editor of several Journal Special Issues. He has been Member of the Technical Program Committee (TPC) of several international conferences and has acted as a Reviewer for major international journals. He was the Workshop Chair of the 2nd International Conference on Computing, Management, and Telecommunications (ComManTel 2014), served as the TPC Chair for the IEEE GLOBECOM 2013, Workshop on "Trusted Communications with Physical Layer Security", and served as Symposium Co-Chair (Communication Theory Symposium) of the International Conference on Recent Advances on Signal Processing, Telecommunications, and Computing (SigTelCom 2017). Currently, he serves as Track Chair (Track 6 - Green Communications and Networks; Track - Recent Results on 5G) of the IEEE 85th Vehicular Technology Conference (VTC2017-Spring), as Track Co-Chair (Track 1 - Antenna Systems, Propagation, and RF Design) of the IEEE VTC2017-Fall, and as Publicity Co-Chair of the 28th IEEE International Symposium on Personal, Indoor, and Mobile Radio Communications (PIMRC 2017). Also, he acts as a Scientific Consultant of the National Council of Scientific and Technological Development (CNPq), Brazil and, he is a Productivity Research Fellow of CNPq and Member of the Advisory Board of the Ceará Council of Scientific and Technological Development (FUNCAP), Area: Telecommunications. Prof. da Costa is the recipient of three conference paper awards. He received the Exemplary Reviewer Certificate of the IEEE WIRELESS COMMUNICATIONS LETTERS in 2013, the Exemplary Reviewer Certificate of the IEEE COMMUNICATIONS LETTERS in 2016, the Certificate of Appreciation of Top Associate Editor for outstanding contributions to IEEE TRANSACTIONS ON VEHICULAR TECHNOLOGY in 2013 and 2015, and the Exemplary Editor Award of IEEE COMMUNICATIONS LETTERS in 2016. He is a Senior Member of IEEE, Member of IEEE Communications Society and IEEE Vehicular Technology Society.



Klaus David, Kassel University, Germany

Klaus David is full University Professor since 1998 and since 2000 head of the chair of communication technology (ComTec) at Kassel University, Germany. His research interests include mobile networks, applications and context awareness. He has 12 years of industrial experience in major companies like HP, Bell Northern Research, IMEC, T-Mobile (as Head of Group and UMTS project leader) and IHP (as Head of Department), with five years of international experience in the UK,

Belgium, USA, and Japan. He has published over 200 scientific articles, including 3 books, and has registered over 10 patents. He is active in IEEE (Editor in Chief IEEE VT Magazine, BoG IEEE VT), NGMN (next generation mobile networks – the worldwide operator organization) as advisor, WWRF (Wireless World Research Forum) as publication manager and he is involved in many conferences, such as IST Future Network & Mobile Summit 2012 Berlin as TPC chair or in 2013, 14, 15, 16, and 18 in IEEE PerCom as TPC member. Also, he is a regular technology and strategy consultant to industry. Klaus David is also co-founder of two start-up companies.



Roberto de Marca, PUC-Rio, Brazil

Roberto de Marca received his degree in Electrical Engineering from the Catholic University in Rio de Janeiro. He worked one year in the data communications department of EM-BRATEL, then the government owned long-distance carrier. He then received Fulbright Scholarship for graduate studies at the University of Southern California, where he earned a Ph.D. in Electrical Engineering. Since 1978 Prof. de Marca has been on the faculty of the Catholic University, Rio de Janeiro, having held several leadership positions including Associate Academic Vice President, Director of Development and Vice-Dean of Science and Engineering Center. Throughout his career Roberto built an extensive international experience enjoying appointments in universities and industrial laboratories in different countries. Twice on leave he served as Scientific Consultant with AT&T Bell Laboratories, Murray Hill. In 2008 he was a Visiting Professor with the Hong Kong University of Science and Technology. He also held a Guest Scientist appointment with NEC Network Research Laboratories in Heidelberg, Germany. His technical activities at Bell Labs and NEC resulted in patents in the area of mobile communications. Earlier in his career he was also a Visiting Professor at the Politecnico di Torino, Italy, and a visiting scholar at UCLA, University of Toronto and Telecom Paris. As Scientific Director of the Brazilian National Research Council, managing a 300 million dollar research funding program, Dr. de Marca authorized the startup money for the national research network that led the way to the widespread use of Internet in Brazil. He was a delegate to several ITU meetings where the wireless 3G specifications were developed and chaired one of the working groups. Recently, he served three years as a member of the presidential advisory committee of Finep, the largest Brazilian funding agency/bank for research and innovation.



José A. del Peral-Rosado, Universitat Autònoma de Barcelona, Spain

José A. del Peral-Rosado (S'12–M'15) received the Ph.D. degree in telecommunications engineering from the Universitat Autònoma de Barcelona (UAB) in 2014. Since 2014, he has been a Post-Doctoral Researcher with the Department of Telecommunications and Systems Engineering, UAB, and holds a grant from the European Space Agency (ESA) under the NPI programme. From 2014 to 2016, he was a Visiting Researcher

with the European Space Research and Technology Centre (ESTEC) at ESA. He was the publication chair of the ICL-GNSS 2016 conference, and he has organised several seminars within the topic of LTE, hybrid and 5G localization at relevant European institutions, such as ESA, DLR and EC-JRC. His research interests are in signal processing with applications to communications and navigation, hybrid satellite and terrestrial localization, and synchronization techniques and positioning with GNSS, 4G LTE, and 5G systems.



Panagiotis Demestichas, University of Piraeus, Greece

Panagiotis Demestichas received the Diploma and the Ph.D. degrees in Electrical Engineering from the National Technical University of Athens (NTUA). Since April 2012 he is full Professor at the Department of Digital Systems of the University of Piraeus, also leading the Telecommunication Networks and Integrated Services (TNS) laboratory (<http://tns.ds.unipi.gr>). In the period from October 2015 to September 2016 he was on Sabbatical, collaborating with the University of Surrey and in

particular its 5G Innovation Center. He has served as the Chairman of the Department of Digital Systems of the University of Piraeus (09.2011–09.2015), as an Assistant Professor (09.2002–11.2007) and as an Associate Professor (12.2007–03.2012), he led (Project Coordinator) the project OneFIT (07.2010–12.2012), and he served as Technical Manager of the project E3 (09.2008–12.2009), while also being Chairman of various Work Groups of WWRF, the most recent being the WGC "Communication Architectures and Technologies" (01.2004–12.2015). Professor Demestichas teaches telecommunication networks, network design and management and queuing systems at both undergraduate and post-graduate level. He has supervised ten already completed PhD theses, and four currently under development. Currently the TNS laboratory participates in ICT projects partially funded by the European Union in the context of Horizon2020. The main research areas of the laboratory are smart/cognitive/autonomic management/convergence, management of ICT infrastructures/core-fixed access, applications/integrated services, SDN/NFV, smart wireless access, cognitive radio networks, opportunistic/sensor networks, as well

as cloud/Internet of Things. Professor Demestichas participates in the project EuCon-NeCts2, in the context of which he organized the European Conference on Networks and Communications (EUCNC 2016), as the Chair of the Technical Programme Committee. The conference took place in Athens, Greece in June 2016. He has participated through various leading roles in the projects SLALOM, UniverSelf, iCore and ACROPOLIS. At a European level he has actively participated in research and development project under the framework programmes RACE II, ACTS, BRITE/EURAM, EURET, IST/FP5, IST/FP6, ICT/FP7. His recent interests include 5G aspects, and especially, the exploitation of spectrum beyond 6 GHz, overall spectrum management, 5G architectures, knowledge-based and predictive management, virtualization technologies based on SDN and NFV. He has several publications in these areas in international journals and refereed conferences. In terms of standardization, he has contributed to various standardization bodies such as ETSI and IEEE. He is a senior member of the IEEE, member of ACM and the Technical Chamber of Greece.



Tayeb Denidni, INRS, Canada

Tayeb A. Denidni (SM'09) received the M.Sc. and Ph.D. degrees in electrical engineering from Laval University, Quebec City, QC, Canada, in 1990 and 1994, respectively. From 1994 to 2000, he was a Professor with the Engineering Department, Université du Québec in Rimouski, Rimouski, QC, Canada, where he founded the Telecommunications Laboratory. He served as a Principal Investigator on many research project sponsored by NSERC, FCI, and numerous industries. Since

2000, he has been with the Institut National de la Recherche Scientifique, Université du Québec, Montreal, QC, Canada, where he found the RF Laboratory. He has great experience in antenna design and is leading a large research group consisting of three research scientists, six Ph.D. students, and one M.Sc. student. His current research interests include reconfigurable antennas using EBG and FSS structures, dielectric resonator antennas, metamaterial antennas, adaptive arrays, switched multibeam antenna arrays, ultrawideband antennas, microwave, and the development for wireless communications systems. Dr. Denidni served as an Associate Editor of the IEEE Antennas Wireless Propagation Letters from 2005 to 2007 and the IEEE TRANSACTIONS ON ANTENNAS PROPAGATION from 2008 to 2010. Since 2015, he has been an Associate Editor of the IET Electronics Letters. He was a recipient of the Outstanding Research and Teaching Achievements from INRS in 2012 and 2013.



Subhrakanti Dey, Uppsala University, Sweden

Subhrakanti Dey was born in India, in 1968. He received the Bachelor in Technology and Master in Technology degrees from the Department of Electronics and Electrical Communication Engineering, Indian Institute of Technology, Kharagpur, in 1991 and 1993, respectively, and the Ph.D. degree from the Department of Systems Engineering, Research School of Information Sciences and Engineering, Australian National University, Canberra, in 1996. He is currently a Professor with

the Dept. of Engineering Sciences in Uppsala University, Sweden. Prior to this, he was a Professor with the Department of Electrical and Electronic Engineering, University of Melbourne, Parkville, Australia, from 2000 until early 2013. From September 1995 to September 1997, and September 1998 to February 2000, he was a Postdoctoral Research Fellow with the Department of Systems Engineering, Australian National University. From September 1997 to September 1998, he was a Postdoctoral Research Associate with the Institute for Systems Research, University of Maryland, College Park. His current research interests include wireless communications and networks, signal processing for sensor networks, networked control systems, and molecular communication systems. Professor Dey currently serves on the Editorial Board of IEEE Transactions on Signal Processing and IEEE Transactions on Control of Network Systems. He was also an Associate Editor for the IEEE Transactions on Signal Processing during 2007-2010 and the IEEE Transactions on Automatic Control during 2004-2007, and Associate Editor for Elsevier Systems and Control Letters during 2003-2013.



Harpreet Dhillon, Virginia Tech, USA

Harpreet S. Dhillon (S'11–M'13) received the B.Tech. degree in Electronics and Communication Engineering from IIT Guwahati, India, in 2008; the M.S. degree in Electrical Engineering from Virginia Tech, Blacksburg, VA, USA, in 2010; and the Ph.D. degree in Electrical Engineering from the University of Texas at Austin, TX, USA, in 2013. After a postdoctoral year at the University of Southern California (USC), Los Angeles, CA, USA, he joined Virginia Tech in August 2014, where he is currently an Assistant Professor of Electrical and Computer Engineering. He has held internships at Alcatel-Lucent Bell Labs in Crawford Hill, NJ, USA; Samsung Research America in Richardson, TX, USA; Qualcomm Inc. in San Diego, CA, USA; and Cercom, Politecnico di Torino in Italy. His research interests include communication theory, stochastic geometry, geo-location, and wireless ad hoc and heterogeneous cellular networks. Dr. Dhillon has been a co-author of five best paper award recipients including the 2016 IEEE Communications Society (ComSoc) Heinrich Hertz Award, the 2015 IEEE ComSoc Young Author Best Paper Award, the 2014 IEEE ComSoc Leonard G. Abraham Prize, the 2014 European Wireless Best Student Paper Award, and the 2013 IEEE International Conference in Communications Best Paper Award in the Wireless Communications Symposium. He was also the recipient of the USC Viterbi Postdoctoral Fellowship, the 2013 UT Austin Wireless Networking and Communications Group (WNCG) leadership award, the UT Austin Microelectronics and Computer Development (MCD) Fellowship, and the 2008 Agilent Engineering and Technology Award. He is currently an editor of the IEEE Transactions on Wireless Communications and the IEEE Wireless Communications Letters.



Piergiuseppe Di Marco, Ericsson Research, Sweden

Piergiuseppe Di Marco is a Senior Researcher at Ericsson Research in Stockholm, Sweden. He joined Ericsson in 2014 and he is currently working as a standardization delegate in the Bluetooth SIG. His research interests include wireless networking and standards for the Internet of Things. Piergiuseppe received his Ph.D. degree in Telecommunications from the Royal Institute of Technology in Stockholm.



Ming Ding, CSIRO, Australia

Ming Ding (M'12, SM'17) received the B.S. and M.S. degrees (with first class Hons.) in electronics engineering from Shanghai Jiao Tong University (SJTU), Shanghai, China, and the Doctor of Philosophy (Ph.D.) degree in signal and information processing from SJTU, in 2004, 2007, and 2011, respectively. Currently, he is a senior research scientist in Data61, CSIRO, Australia. He has authored 40+ papers in IEEE journals and conferences, all in recognized venues, and about 20 3GPP

standardization contributions, as well as a Springer book Multi-point Cooperative Communication Systems: Theory and Applications. Also, as the first inventor, he holds 15 CN, 7 JP, 3 US, 2 KR patents and co-authored another 100+ patent applications on 4G/5G technologies. He is or has been Guest Editor/Co-Chair/Co-Tutor/TPC member of several IEEE top-tier journals/conferences, e.g., the IEEE Journal on Selected Areas in Communications, the IEEE Communications Magazine, and the IEEE Globecom Workshops, etc. For his inventions and publications, he was the recipient of the President's Award of Sharp Laboratories of China in 2012, and served as one of the key members in the 4G/5G standardization team when it was awarded in 2014 as Sharp Company Best Team: LTE 2014 Standardization Patent Portfolio.



Zhiguo Ding, Lancaster University, UK

Zhiguo Ding received his B.Eng in Electrical Engineering from the Beijing University of Posts and Telecommunications in 2000, and the Ph.D degree in Electrical Engineering from Imperial College London in 2005. From Jul. 2005 to Aug. 2014, he was working in Queen's University Belfast, Imperial College and Newcastle University. Since Sept. 2014, he has been with Lancaster University as a Chair Professor in Signal Processing. From Sept. 2012 to Sept. 2017, he is also an academic visitor

in Princeton University working with Prof. Vincent Poor. Dr. Ding's research interests are 5G networks, game theory, cooperative and energy harvesting networks, and statistical

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



Rui Dinis, Universidade Nova de Lisboa (UNL), Portugal

Rui Dinis received the Ph.D. degree from Instituto Superior Técnico (IST), Technical University of Lisbon, Portugal, in 2001 and the Habilitation in Telecommunications from Faculdade de Ciências e Tecnologia (FCT), Universidade Nova de Lisboa (UNL), in 2010. From 2001 to 2008 he was a Professor at IST. Currently he is an associated professor at FCT-UNL. During 2003 he was an invited professor at Carleton University, Ottawa, Canada. He was a researcher at CAPS (Centro de Análise e Processamento de Sinal), IST, from 1992 to 2005 and a researcher at ISR (Instituto de Sistemas e Robótica) from 2005 to 2008. Since 2009 he is a researcher at IT (Instituto de Telecomunicações). Rui Dinis is editor at IEEE Transactions on Communications (Transmission Systems - Frequency-Domain Processing and Equalization) and guest editor for Elsevier Physical Communication (Special Issue on Broadband Single-Carrier Transmission Techniques). He has been actively involved in several national and international research projects in the broadband wireless communications area. His main research interests include modulation and signal design, equalization and multiuser detection, channel estimation and synchronization, nonlinear effects in digital communications and cross layer design and optimization.



Tarek Djerafi, INRS, Canada

Tarek Djerafi received the B.Sc. degree from the Institut d'Aéronautique de Blida, Blida, Algeria, in 1998, and the M.A.Sc. and Ph.D. degrees (Hons.) in electrical engineering from the École Polytechnique de Montréal, Montréal, QC, Canada, in 2005 and 2011, respectively. He was with SCP SCIENCE, Montréal, as an EMC Expert from 2010 to 2011, a Post-Doctoral Fellow with INRS-EMT, Montréal, from 2012 to 2014, and with École Polytechnique de Montréal from 2014 to 2015. He was a Research Associate with the Poly-Grames Research Center, Montréal, from 2015 to 2016. He is currently an Assistant Professor with the Institut National de Recherche Scientifique, Énergie Matériaux et Télécommunications, Montréal. His current research interests include the telecommunication antennas, beam forming network, and RF/millimeter-wave/terahertz components and systems design.



Octavia Dobre, MUN, Canada

Octavia A. Dobre received the Ph.D. degree in electrical engineering from the University Politehnica of Bucharest (formerly Polytechnic Institute), Romania, in 2000. She is currently a Full Professor and Research Chair with the Faculty of Engineering and Applied Science, Memorial University, Canada. She was with the New Jersey Institute of Technology, USA, and the University Politehnica of Bucharest. She was a Visiting Professor with the Université de Bretagne Occidentale, France, and the Massachusetts Institute of Technology, USA, in 2013. Her research interests comprise 5G enabling technologies, blind signal identification and parameter estimation techniques, transceiver optimization algorithms, and signal processing for optical and underwater communications. She published over 190 journal and conference papers in the above areas. She was a recipient of the Royal Society Scholarship at Westminster University, UK, in 2000, and held a Fulbright Fellowship at Stevens Institute of Technology, USA, in 2001. Dr. Dobre serves as the Editor-in-Chief for the IEEE COMMUNICATIONS LETTERS. She was an Editor of the IEEE TRANSACTIONS ON WIRELESS COMMUNICATIONS and other prestigious journals. She served as the Technical Co-Chair of symposia at numerous conferences, such as IEEE GLOBECOM and IEEE ICC. She chairs the IEEE ComSoc Women

in Communications Engineering Standing Committee. She is a Member-at-Large of the Administrative Committee of the IEEE Instrumentation and Measurement Society. She is a registered Professional Engineer in the province of Newfoundland and Labrador, Canada.



Linda Doyle, Trinity College Dublin, Ireland

Linda Doyle is an associate professor in Trinity College, University of Dublin in the Department of Electronic & Electrical Engineering. Prof. Doyle received her Ph.D. in 1996 and has been a faculty member since then. Professor Doyle is Director of CTVR. As well as directing the Centre, Prof. Doyle manages one of the CTVR research groups and has a team of 20 researchers focusing on wireless networking, cognitive radio, reconfigurable networks, dynamic spectrum access, spectrum trading and spectrum regulation. Prof. Doyle is highly active in the field of cognitive radio. She was vice-chair of IEEE DySPAN 2007 which was hosted in Dublin. IEEE DySPAN is the premier conference in the area of dynamic spectrum access networks. Professor Doyle is currently TPC Chair for the Globecom 2010 SAC on Cognitive Radio and Cognitive Networks. She is also vice-chair of the IEEE Technical Committee on Cognitive Networks. Prof. Doyle served as Guest Editor for the Special Issue on Cognitive Radio of Annals of Telecommunications 2009 and also for the Special Issue on Cognitive Radio of IEEE Communications Magazine, May 2007. In 2009 Linda wrote a book on The Essentials of Cognitive Radio published by Cambridge University Press. She has published over 150 papers in prominent internationally circulated journals. Prof. Doyle has also played a role in spectrum policy at a national level and has been involved with the Irish Department of Communications in writing a white paper on spectrum policy for Ireland. Prof. Doyle is on the OFCOM spectrum advisory board OSAB.



Adam Drobot, OpenTechWorks Inc., USA

Adam T. Drobot is a technologist with management expertise and over forty years of experience with business, government, and academia. Today his activities include strategic consulting, start-ups, and participation in industry associations and government advisory bodies. He is the Chairman of the Board of OpenTechWorks, Inc. a company specializing in open source software. Previously he was the Managing Director and CTO of 2M Companies in Dallas, TX, from 2010-2012, and President of the Applied Research and Government Business Units at Telcordia Technologies and the company's CTO from 2002 to 2010. Prior to that, Adam managed the Advanced Technology Group at Science Applications International Corporation (SAIC). He also served as Senior Vice President for Science and Technology as part of his 27 years of service at SAIC from 1975 to 2002. Adam has been the principal or key participant in the development of several large, scientific code systems and software for managing the design and production of complex platforms. He has published more than 100 journal articles, and is a frequent contributor to industry literature. He currently holds 26 patents. Adam is the 2007 recipient of IEEE's Managerial Excellence Award. He is currently a member of Several Corporate Boards, the FCC Technology Advisory Council, and he also Chairs the Awards Recognition Council for the IEEE and the IEEE IoT Activities Board. Adam is on the Board of the Telecommunications Industry Association and Chairs the TIA Technology Committee. He holds a BS in Engineering Physics from Cornell University and a PhD. in Plasma Physics from the University of Texas.



Ashutosh Dutta, AT&T, USA

Ashutosh Dutta is currently Director of Technology Security within AT&T's Chief Security Office where he leads a team that is responsible for design and development of security for virtualized networks. His 25 years of career include CTO of Wireless at a Cybersecurity company NIKSUN, Senior Scientist in Telcordia Applied Research, Director of Central Research Facility at Columbia University, and Computer Engineer with TATA Motors. He has more than 80 conference and journal publications, three book chapters, 30 issued patents, and has given tutorials in mobility management at various conferences. Ashutosh is co-author of the book, titled, "Mobility Protocols and Handover Optimization: Design, Evaluation and Application," published by John & Wiley and IEEE. He serves as the editor-in-chief for the Journal of Cybersecurity and Mobility published by River Publishers. Ashutosh served as the chair for IEEE Princeton / Central Jersey Section, Industry Relation Chair for Region 1 and MGA, Pre-University

Coordinator for IEEE MGA and chair for Ad Hoc Committee for Public Visibility for ComSoc. Ashutosh co-founded the IEEE STEM conference (ISEC) in 2011 and helped to implement EPICS (Engineering Projects in Community Service) in the high schools within PCJS. Ashutosh has been serving as the Director of Industry Outreach for IEEE Communications Society since 2013 and led a series of 5G Summits. He was recipient of the prestigious 2009 IEEE MGA Leadership award and 2010 IEEE-USA professional leadership award. Ashutosh obtained his BS in EE from NIT Rourkela, India, MS in Computer Science from NJIT and earned his M. Phil. and Ph.D. in Electrical Engineering from Columbia University under the supervision of Prof. Henning Schulzrinne.



Bosco Eduardo Fernandes, COMCON, Germany

Bosco Eduardo Fernandes is a highly skilled senior executive with 25+ years of proven Industry experience in innovative Communication Network concepts and technology. He held various managerial positions in the past at major Corporates and is now CEO and Senior Strategic Advisor of an Independent consulting company, focused on SDN/NFV, 5G, IoT, Big Data, and Cybersecurity, LPWAN, IoT, and Future Innovation of technologies for Public and enterprise networks including

Utilities and Smart Cities. His contribution to Research, Standards bodies, many publications and Industry Fora work programs has been well received. Bosco holds a Master's (Dipl. Ing.) degree in Electrical Engineering from the Munich University and an Executive MBA. He is a Senior Member of IEEE, member of Internet Society and Russian Telecommunications.



Waleed Ejaz, Ryerson University, Canada

Waleed Ejaz (S'12–M'14–SM'16) received the B.Sc. degree in computer engineering from the University of Engineering Technology, Taxila, Pakistan, the M.Sc. degree in computer engineering from the National University of Sciences Technology, Islamabad, Pakistan, and the Ph.D. degree in information and communication engineering from Sejong University, South Korea, in 2014. He was a Post-Doctoral Fellow at Queen's University, Kingston, Canada. He was with top engineering universities in Pakistan and Saudi Arabia as a Faculty Member. He is currently a Senior Research Associate with the Department of Electrical and Computer Engineering, Ryerson University, Toronto, Canada. His current research interests include Internet of Things, energy harvesting, 5G cellular networks, and mobile cloud computing. He is currently serving as an Associate Editor of the Canadian Journal of Electrical and Computer Engineering and IEEE ACCESS. He serves on the Special Issues in IET Communications, IEEE ACCESS, and the Journal of Internet Technology. He also completed certificate courses on Teaching and Learning in Higher Education from the Chang School, Ryerson University.

sities in Pakistan and Saudi Arabia as a Faculty Member. He is currently a Senior Research Associate with the Department of Electrical and Computer Engineering, Ryerson University, Toronto, Canada. His current research interests include Internet of Things, energy harvesting, 5G cellular networks, and mobile cloud computing. He is currently serving as an Associate Editor of the Canadian Journal of Electrical and Computer Engineering and IEEE ACCESS. He serves on the Special Issues in IET Communications, IEEE ACCESS, and the Journal of Internet Technology. He also completed certificate courses on Teaching and Learning in Higher Education from the Chang School, Ryerson University.



Hany Elgala, University at Albany, USA

Hany Elgala is an Assistant Professor in the Electrical and Computer Engineering Department, College of Engineering and Applied Sciences (CEAS), at the University at Albany - State University of New York (SUNY). Before moving to SUNY Albany, he was a Senior Postdoc and Research Professor at Boston University (BU). There, he was the co-leader of the Multimedia Communications Lab (MCL) and the Communications Testbed leader at the National Science Foundation (NSF)

Light Enabled Systems & Applications (LESA) Engineering Research Center (ERC). From 2010-12, he was the co-leader of the Cellular and Wireless Communications (CWC) Lab at Jacobs University in Germany. There, he coordinated two industrial projects with Airbus Germany and the European Aeronautic Defense and Space Company (EADS) to realize high-speed optical wireless networks in airplane cabins. His research focuses on visible light communications (VLC) or LiFi systems, wireless networking and embedded systems. He is a member of the OSA and IEEE Communications Society.



Javan Erfanian, Bell Canada, Canada

As Distinguished Member of Technology, at Bell Mobility, Canada, Javan primes the wireless technology strategic direction and industry initiatives. In this role, Javan has worked with the global industry and various forums, and also the research community. In particular, he has been contributing to the work programs at NGMN, most recently the 5G global initiative, for which he was the Co-Lead & the Chief Editor, which led to the publication of the NGMN 5G White Paper in March. He continues to be actively engaged in the ongoing work on the technology / industry roadmap and the road to 5G at NGMN, and elsewhere. Javan Grew up in Iran, and completed his education at the University of Calgary and the University of Toronto, with research publications and many citations. He has taught many academic and industry courses and programs. In his IEEE involvement, Javan has been a Communications Society Distinguished Lecturer for years, an editor and author for the Wireless Engineering Book of Knowledge, and a recipient of the IEEE Millennium Medal (2000).

to be actively engaged in the ongoing work on the technology / industry roadmap and the road to 5G at NGMN, and elsewhere. Javan Grew up in Iran, and completed his education at the University of Calgary and the University of Toronto, with research publications and many citations. He has taught many academic and industry courses and programs. In his IEEE involvement, Javan has been a Communications Society Distinguished Lecturer for years, an editor and author for the Wireless Engineering Book of Knowledge, and a recipient of the IEEE Millennium Medal (2000).



Carlo Fischione, KTH Royal Institute of Technology, Sweden

Carlo Fischione is currently a tenured Associate Professor at KTH Royal Institute of Technology, Electrical Engineering and ACCESS Linnaeus Center, Stockholm, Sweden. He received the Ph.D. degree in Electrical and Information Engineering (3/3 years) in May 2005 from University of L'Aquila, Italy, and the Laurea degree in Electronic Engineering (Laurea, Summa cum Laude, 5/5 years) in April 2001 from the same University. He has held research positions at Massachusetts Institute of

Technology, Cambridge, MA (2015, Visiting Professor); Harvard University, Cambridge, MA (2015, Associate); University of California at Berkeley, CA (2004-2005, Visiting Scholar, and 2007-2008, Research Associate); and Royal Institute of Technology, Stockholm, Sweden (2005-2007, Research Associate). His research interests include optimization with applications to wireless sensor networks, networked control systems, wireless networks, security and privacy. He has co-authored over 100 publications, including a book, book chapters, international journals and conferences, and international patents. He received or co-received a number of awards, including the best paper award from the IEEE Transactions on Industrial Informatics (2007), the best paper awards at the IEEE International Conference on Mobile Ad-hoc and Sensor System 05 and 09 (IEEE MASS 2005 and IEEE MASS 2009), the Best Paper Award of the IEEE Sweden VT-COM-IT Chapter (2014), the Best Business Idea awards from VentureCup East Sweden (2010) and from Stockholm Innovation and Growth (STING) Life Science in Sweden (2014), the "Ferdinando Filauri" award from University of L'Aquila, Italy (2003), the "Higher Education" award from Abruzzo Region Government, Italy (2004), the Junior Research award from Swedish Research Council (2007), the Silver Ear of Wheat award in history from the Municipality of Tornimparte, Italy (2012). He is Associated Editor of Elsevier Automatica, has chaired or served as a technical member of program committees of several international conferences and is serving as referee for technical journals. Meanwhile, he also has offered his advice as a consultant to numerous technology companies such as Berkeley Wireless Sensor Network Lab, Ericsson Research, Synopsys, and United Technology Research Center. He is co-founder and CTO of the IoT start-up company MIND Music Labs. He is Member of IEEE (the Institute of Electrical and Electronic Engineers), and Ordinary Member of DASP (the academy of history Deputazione Abruzzese di Storia Patria).



Benoit Fleury, iBwave, Canada

Benoit Fleury, having joined iBwave in 2013 as VP of Product Line Management, is responsible for evolving iBwave's current products as well as expanding the company's overall product portfolio. He has extensive experience in the telecommunications industry ranging from startups to global corporations. Before joining iBwave, he led the Transport & Datacom Business Unit at EXFO, a global test & measurement equipment provider. Prior to this he was CEO of Lynx Mobility, a Northern

Canadian mobile operator which he helped establish from the ground up. Earlier in his career, Benoit was a key member of the Nortel team which developed and deployed high capacity optical systems worldwide. Mr. Fleury holds a Bachelor of Electrical Engineering from McGill University and a Masters in Electrical Engineering from Concordia University, both in Montreal. He is an advisory board member for Concordia University's Department of Electrical and Computer Engineering as well as an international MBA competition judge

with Concordia's John Molson School of Business.



Carol Fung, Virginia Commonwealth Univ., USA

Carol Fung received her Bachelor degree and Master degree in computer science from the university of Manitoba (Canada), and her PhD degree in computer science from the university of Waterloo (Canada). Her research interests include collaborative intrusion detection networks, social networks, security issues in mobile networks and medical systems, Security issues in next generation networking, and machine learning in intrusion detection. She is the recipient of the IEEE/IFIP IM

2015 Young Professional Award, Alumni Gold Medal of university of Waterloo in 2013, best dissertation awards in IM2013, the best student paper award in CNSM2011 and the best paper award in IM2009. She received numerous prestige awards and scholarships including Google Anita Borg scholarship, NSERC Postdoc fellowship, David Cheriton Scholarship, NSERC Postgraduate Scholarship, and President's graduate scholarship. She has been a visiting scholar at POSTECH (South Korea), a software engineer intern at Google, and a research intern at BlackBerry.



David Gesbert, EURECOM, France

David Gesbert (F'11) is Professor and Head of the Mobile Communications Department, EURECOM, France, where he also heads the Communications Theory Group. He obtained the Ph.D degree from École Nationale Supérieure des Télécommunications, France, in 1997. From 1997 to 1999 he has been with the Information Systems Laboratory, Stanford University. In 1999, he was a founding engineer of Iospan Wireless Inc, San Jose, Ca., a startup company pioneering MIMO-OFDM

(now Intel). Between 2001 and 2003 he has been with the Department of Informatics, University of Oslo as an adjunct professor. D. Gesbert has published about 230 papers and several patents all in the area of signal processing, communications, and wireless networks. He was named in the 2014 Thomson-Reuters List of Highly Cited Researchers in Computer Science. Since 2015, he holds an ERC Advanced grant on the topic of "Smart Device Communications." D. Gesbert was a co-editor of several special issues on wireless networks and communications theory, for Journal on Selected Areas in Communications (2003, 2007, 2009), EURASIP Journal on Applied Signal Processing (2004, 2007), Wireless Communications Magazine (2006). He served on the IEEE Signal Processing for Communications Technical Committee, 2003-2008. He was an associate editor for IEEE Transactions on Wireless Communications and the EURASIP Journal on Wireless Communications and Networking. He authored or co-authored papers winning the 2015 IEEE Best Tutorial Paper Award (Communications Society), 2012 SPS Signal Processing Magazine Best Paper Award, 2004 IEEE Best Tutorial Paper Award (Communications Society), 2005 Young Author Best Paper Award for Signal Proc. Society journals, and paper awards at conferences 2011 IEEE SPAWC, 2004 ACM MSWiM workshop. He co-authored the book "Space Time Wireless Communications: From Parameter Estimation to MIMO Systems," Cambridge Press, 2006. In 2013, he was a General Chair for the IEEE Communications Theory Workshop, and a Technical Program Chair for the Communications Theory Symposium of ICC2013. He is a Technical Program Chair for IEEE ICC 2017, to be held in Paris.



Ali Ghayeb, TAMUQ, Qatar

Ali Ghayeb received the Ph.D. degree in electrical engineering from the University of Arizona, Tucson, USA, in 2000. He is currently a Professor with the Department of Electrical and Computer Engineering, Texas A&M University at Qatar. He is also with the Qatar Computing Research Center as a Senior Scientist. He was a co-recipient of the IEEE Globecom 2010 Best Paper Award. He is the co-author of the book entitled Coding for MIMO Communication Systems (Wiley, 2008). His research

interests include wireless and mobile communications, physical layer security, stochastic geometry, and MIMO systems. He has instructed/co-instructed technical tutorials at several major IEEE conferences. He served as the Executive Chair of the Communications Theory Symposium of the IEEE Globecom 2011. He served as the Executive Chair of the 2016 IEEE WCNC conference. He serves as an Editor of the IEEE TRANSACTIONS ON COMMUNICATIONS. He served as an Associate Editor of the IEEE TRANSACTIONS ON WIRELESS COMMUNICATIONS, the IEEE TRANSACTIONS ON SIGNAL PROCESSING, the IEEE TRANSACTIONS ON VEHICULAR TECHNOLOGY, Physical Communications (Elsevier),

and the Wireless Communications and Mobile Computing (Wiley).



Roch Glitho, Concordia Univ., Canada

Roch Glitho holds a Ph.D. (Tekn. Dr.) in tele-informatics (Royal Institute of Technology, Stockholm, Sweden), and M.Sc. degrees in business economics (University of Grenoble, France), pure mathematics (University of Geneva, Switzerland), and computer science (University of Geneva). He is an Associate Professor of Networking and Telecommunications at the Concordia Institute of Information Systems Engineering - CI-ISE where he holds a Canada Research Chair in End-User

Services Engineering for Communications Networks and leads the Telecommunications Service Engineering Laboratory. He is also an adjunct professor at the University of Western Cape (South Africa), Telecoms SudParis (France); the University Degli Studi di Milan (Italy); and the Institut de Mathématiques et Sciences Physiques (IMSP), University of Abomey-Calavi (Republic of Benin). In the past he has worked in industry for almost a quarter of a century and has held several senior technical positions at LM Ericsson in Sweden and Canada (e.g. expert, principal engineer, senior specialist). His industrial experience includes research, international standards setting, product management, project management, systems engineering and software/firmware design. In the past he has served as IEEE Communications Society distinguished lecturer, Editor-In-Chief of IEEE Communications Magazine and Editor-In-Chief of IEEE Communications Surveys & Tutorials. His research areas include architectures for end-users services in conventional and challenged networks, virtualization, cloud computing, Internet of Things, distributed systems and ICT for development. He holds 24 patents and is the author of many refereed journal / conference papers.



Mohamed Guadane, INRS, Canada

Mohamed Guadane received the Diplôme d'Ingénieur degree in telecommunications from the École Nationale d'Électronique et des Télécommunications de Sfax (ENET'Com) in 2015. He is currently an M.Sc. student at INRS-EMT, University of Quebec, Montreal, Canada. His current research interests focus on the field of Wireless Sensor Networks (WSN).



Mesut Günes, University of Magdeburg, Germany

Mesut Günes Chair at Otto-von-Guericke University Magdeburg, Germany. He received a diploma degree in Computer Science from RWTH Aachen University, Germany In 1998 and a Ph.D. in 2004. From 2004–2005 he was a research fellow at the International Computer Science Institute (ICSI), Berkeley, USA. From 8/2007 to 4/2014 he was professor for Distributed, Embedded Systems at the Freie Universität Berlin, Germany. From 05/2014 to 09/2016 he was professor for Communication

And Networked Systems At the University Of Munster, Germany. Since 10/2016 He is Chair for Communication And Networked Systems (ComSys) at the Otto-von-Guericke University Magdeburg, Magdeburg, Germany. His Research interests include distributed communication systems, multimedia communication, internet of things (IoT), wired and wireless computer networks, particularly wireless sensor networks, wireless mesh networks, and mobile ad-hoc networks. Dr. Mesut Günes is involved in several national and international research projects in the mentioned areas.



Lajos Hanzo, Univ. Southampton, UK

Lajos Hanzo (<http://www-mobile.ecs.soton.ac.uk>) FREng, FIEEE, FIET, Fellow of EURASIP, received his Master degree in electronics in 1976 and his doctorate in 1983. In 2009 he was awarded an honorary doctorate by the Technical University of Budapest and in 2015 by the University of Edinburgh. In 2016 he was admitted to the Hungarian Academy of Science. During his 40-year career in telecommunications he has held various research and academic posts in Hungary, Germany and the UK. Since 1986 he has been with the School of Electronics and Computer Science, University of Southampton, UK, where he holds the chair in telecommunications. He has successfully supervised 111 PhD students, co-authored 18 John Wiley/IEEE Press

books on mobile radio communications totalling in excess of 10 000 pages, published 1600+ research contributions at IEEE Xplore, acted both as TPC and General Chair of IEEE conferences, presented keynote lectures and has been awarded a number of distinctions. Currently he is directing a 60-strong academic research team, working on a range of research projects in the field of wireless multimedia communications sponsored by industry, the Engineering and Physical Sciences Research Council (EPSRC) UK, the European Research Council's Advanced Fellow Grant and the Royal Society's Wolfson Research Merit Award. He is an enthusiastic supporter of industrial and academic liaison and he offers a range of industrial courses. He is also a Governor of the IEEE VTS. During 2008 - 2012 he was the Editor-in-Chief of the IEEE Press and a Chaired Professor also at Tsinghua University, Beijing. For further information on research in progress and associated publications please refer to <http://www-mobile.ecs.soton.ac.uk> Lajos has 27 000+ citations and an H-index of 63.



Syed Ali Hassan, National University of Sciences and Technology, Pakistan

Syed Ali Hassan received his Ph.D. in Electrical Engineering from Georgia Institute of Technology, Atlanta, USA in 2011. He received his M.S. Mathematics from Georgia Tech in 2011 and M.S. Electrical Engineering from University of Stuttgart, Germany, in 2007. He was awarded B.E. Electrical Engineering (highest honors) from National University of Sciences and Technology (NUST), Pakistan, in 2004. His broader area of

research is signal processing for communications. Currently, he is working as an Assistant Professor at the School of Electrical Engineering and Computer Science (SECS), NUST, where he is heading the IPT research group, which focuses on various aspects of theoretical communications. Prior to joining SECS, he worked as a research associate at Cisco Systems Inc., CA, USA, where he was involved with the home networking business unit in devising efficient strategies for home networking. Dr. Hassan is a member of IEEE and IEEE Communications society, author/co-author of numerous IEEE conference and journal papers and a reviewer for many IEEE journals and transactions. He has chaired several sessions in international conferences and has served as a TPC member for IEEE Tencon 2012, IEEE ICET 2012, and IEEE IEISA 2012, IEEE PIMRC 2013, IEEE VTC 2013 among others.



Robert Heath, Univ. Texas 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.



Oliver Holland, King's College London, UK

Oliver Holland led the €3m ICT-ACROPOLIS Network of Excellence—on the topic of spectrum coexistence technologies such as cognitive radio and dynamic spectrum access—from March 2012 until that project completed in December 2013. He then moved on to lead a major trial of TV white space technology as part of the UK's Ofcom TV White Spaces Pilot. Through that initiative, he was prominently involved in assessing the performance of the proposed UK/EU regulations and

conformance requirements for TV white space devices. Linked to that effort and more generally, he is researching potential solutions for TV white space implementation, white space device capabilities, enhancements of geolocation databases and their applications (also for other purposes outside of TV white space), and solutions for aggregation of spectrum opportunities involving TV white space, among others. As one example of achievements linked to such efforts, he recently created and led an idea/submission for the EU €0.5m Collaborative Spectrum Sharing Prize, which won the prize. These are

among numerous other interests spanning all layers of the OSI reference model, evident from his publications. Oliver is Chair of the new IEEE 1918.1 standardisation working group on Tactile Internet, which he created. He is Vice-Chair and a Leadership Member of the IEEE Dynamic Spectrum Access Networks Standards Committee (DySPAN-SC), is Vice-Chair and member of IEEE 1900.1, Chair and member of IEEE 1900.6, Vice-Chair and member of IEEE 1900.7, and Vice-Chair of IEEE 802.22 and the IEEE 802.22.3 standard on spectrum sensing. He is Chair of the new IEEE Standards Committee on Mobile Networks (MobiNet). Oliver was a Technical Editor of the IEEE 1900.4 standard, and was Technical Editor of the IEEE 1900.1a and IEEE 1900.6a standards. He was a Management Committee member representing the UK for the recently-completed COST Actions IC0902 and IC0905 "TERRA", holding various leadership positions therein, both on the topic of cognitive radio. Oliver has served on the TPCs of all major conferences in the area of mobile and wireless communications, has served as Session Chair and Panellist at numerous conferences covering a range of topics, and frequently serves as reviewer for various prestigious international conferences and journals. Oliver has assumed leadership positions in numerous international workshops, conferences, and journals. Among many examples, he was a guest editor of the special issue "Achievements and the Road Ahead: The First Decade of Cognitive Radio," which appeared in IEEE Transactions on Vehicular Technology (TVT), Co-Chair of the "Cognitive Radio and Cooperative Communications" track of IEEE VTC 2010-Fall, Tutorials Co-Chair of IEEE CCNC 2012, TPC Co-Chair of ISWCS 2012, tutorials Co-Chair of ACM MSWiM 2012, Co-Chair of the "Transmission Technologies" track of IEEE VTC 2013-Spring, Co-Chair of the "Wireless Access" track at IEEE VTC 2013-Fall and the "International Perspectives on Communications" track of IEEE MILCOM 2013, Workshops and Tutorials Co-Chair of IEEE PIMRC 2013, Workshops Co-Chair of ISWCS 2014, Co-Chair of the "Spectrum Efficient Management, Sensing and Cognitive Radio" track of IEEE VTC 2015-Spring, Publications Co-Chair and Local Arrangements Chair of IEEE ICC 2015, Posters Chair of IEEE DySPAN 2015, Workshops Chair of ISWCS 2016 and is Co-Chair of the "Dynamic Spectrum Access/Management and Database" track of CROWNCOM 2016, and lead Co-Chair of the Cognitive Radio and Networks track of IEEE ICC 2017. Oliver is an Editor of IEEE TVT. Oliver serves as Vice-Chair of the IEEE Technical Committee on Cognitive Networks (TCNC), and is currently Chair of the United Kingdom and Ireland Chapter of the IEEE Vehicular Technology Society (VTS), and well as Chapters Committee Chair for the entire IEEE VTS—thereby also being a board member of the VTS. Oliver is also a Non-Executive Director of Broadway Partners, a wireless broadband provisioning company using innovative methods such as TV White Spaces, and runs a consultancy company specialising in wireless communications solutions. Oliver has co-authored over 150 publications, which have been cited more than 1,000 times. He has authored/co-edited two books, published by Wiley and Springer.



Ekram Hossain, University of Manitoba, Canada

Ekram Hossain (F'15) is a Professor in the Department of Electrical and Computer Engineering at University of Manitoba, Winnipeg, Canada. He is a Member of the College of the Royal Society of Canada. His current research interests include modeling, design, and analysis of wireless networks with emphasis on 5G cellular networks, cooperative and cognitive wireless systems, and green radio communications. He has authored/edited a number of books in these areas (<http://home.cc.umanitoba.ca/78hossaina>).

He is a highly cited researcher with citation count > 17, 900 in Google Scholar and h-index of 67. He has presented numerous tutorials and invited talks on the above topics (which include tutorials in IEEE ICC, Globecom, WCNC, PIMRC, and VTC). Dr. Hossain served as the Editor-in-Chief for the IEEE Communications Surveys and Tutorials, an Area Editor for the IEEE Transactions on Wireless Communications (2009-2011), and an Editor for the IEEE Transactions on Mobile Computing (2007-2012). Currently he is an Editor for IEEE Wireless Communications. Also, he is a member of the IEEE Press Editorial Board. He was a Distinguished Lecturer of the IEEE Communications Society (2012-2015) and is currently a Distinguished Lecturer of the IEEE Vehicular Technology Society for the term 2016-2017.



Peng Hu, Seneca, Canada

Peng (Ryan) Hu is currently a Professor at Seneca College and has much experience in R&D projects in sensor networks, embedded systems and Internet of Things. He has participated in the AllJoyn project and served as the Participating Technical Advisor of DASH7 Alliance. He is an Associate Editor of the IEEE Canadian Journal of Electrical and Computer Engineering and was the lead organizer of the 2014 IEEE CCECE Workshop on Networking and Cloud Computing Testbeds. He served as the Conference Session Chair of IEEE ICUWB'15 and on the program committees of IEEE AINA'15 and other international conferences. He received his Ph.D. degree in Electrical Engineering from Queen's University and is a licensed professional engineer (P.Eng.) in Ontario, Canada.



Yingbo Hua, University of California Riverside, USA

Yingbo Hua is a senior full professor with the University of California, Riverside, where he joined in 2001. Prior to that, he held a faculty position with the University of Melbourne, Australia, from 1990 to 2000. He received his Ph.D. degree from Syracuse University in 1988. Professor Hua has published hundreds of articles in the fields of signal processing, wireless communications and sensor networks, including a dozen on full-duplex radio technology. He was elected to IEEE Fellow in 2001 and AAAS Fellow in 2011. He is currently a Senior Area Editor for IEEE Transactions on Signal Processing, a Steering Committee Member for IEEE Wireless Communications Letters, and an Associate Editor for IEEE Transactions on Signal and Information Processing over Networks.



Kaibin Huang, Univ. Hong Kong, Hong Kong

Kaibin Huang received the B.Eng. (first-class hon.) and the M.Eng. from the National University of Singapore, respectively, 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 used to be a faculty member in the Dept. of EEE at Yonsei University in S. Korea and currently with the department as an adjunct professor. His research interests focus on the analysis and design of wireless networks using stochastic geometry and multi-antenna techniques. He frequently serves on the technical program committees of major IEEE conferences in wireless communications. He has been the technical chair/co-chair for the IEEE CTW 2013, the Comm. Theory Symp. of IEEE GLOBECOM 2014, and the Adv. Topics in Wireless Comm. Symp. of IEEE/CIC ICC 2014 and has been the track chair/co-chair for IEEE PIMRC 2015, IEEE VTC Spring 2013, Asilomar 2011 and IEEE WCNC 2011. Currently, he is an editor for IEEE Journal on Selected Areas in Communications (JSAC) series on Green Communications and Networking, IEEE Transactions on Wireless Communications, IEEE Wireless Communications Letters. He was also a guest editor for the JSAC special issues on communications powered by energy harvesting and an editor for IEEE/KICS Journal of Communication and Networks (2009-2015). He is an elected member of the SPCOM Technical Committee of the IEEE Signal Processing Society. Dr. Huang received the 2015 IEEE ComSoc Asia Pacific Outstanding Paper Award, Outstanding Teaching Award from Yonsei, Motorola Partnerships in Research Grant, the University Continuing Fellowship from UT Austin, and a Best Paper Award from IEEE GLOBECOM 2006.



Mohamed Ibnkahla, Carleton Univ., Canada

Mohamed Ibnkahla was born in Sousse, a famous coastal city in Tunisia, founded by Phoenician mariners in the 9th century BC (one century before the foundation of Carthage). He obtained the Ph.D. degree and the Habilitation a Diriger des Recherches degree (HDR) from the National Polytechnic Institute of Toulouse (INP), Toulouse, France, in 1996 and 1998, respectively. He obtained an Engineering degree in Electronics (1992) and a Diplôme d'Etudes Approfondies degree (equivalent to MSc) in Signal and Image Processing (1992) all from INP. He did part of his undergraduate studies (classes préparatoires) at Lycee Hoche, Versailles, France (1986-1989). He is currently a Full Professor and Cisco Industrial Research Chair at the Department of

Systems and Computer Engineering, Carleton University, Ottawa, Canada. He was with the Department of Electrical and Computer Engineering, Queen's University, Kingston, Canada (2000-2015), and the Department of Electronics, INP, Toulouse, France (1996-1999). The Cisco Industrial Research Chair is on "Internet of Everything (IoE) Sensor Networks and Technologies". Dr. Ibnkahla has been leading several projects with industry and government agencies. He is currently involved in a number of projects applying wireless communications in key areas of the e-Society, including: smart power grid, control of renewable energy, water management, public health, environment monitoring, wildlife tracking, food traceability and safety risk monitoring, highway safety, intelligent transportation systems, etc. Dr. Ibnkahla has been the Technical Manager of a major European Advanced Communications Technologies and Services (ACTS) Program (1996-1999). He played major roles in a number of Research Networks and Partnership Programs such as the Natural Sciences and Engineering Research Council of Canada (NSERC) DIVA Network, 2010-2015, Ontario Research Fund (ORF) WISENSE Project, 2009-2015, NSERC COGWSN project, 2011-2014. He has published the following books: Signal Processing for Mobile Communications Handbook, Taylor and Francis Publishers – CRC Press, 2004, Adaptive Signal Processing in Wireless Communications, Taylor and Francis Publishers – CRC Press, 2008, Adaptive Networking and Cross-layer Design in Wireless Networks, Taylor and Francis Publishers – CRC Press, 2008, Wireless Sensor Networks: A Cognitive Perspective, Taylor and Francis Publishers – CRC Press 2012 (translated to Chinese in 2015), and Cooperative Cognitive Radio Networks: The Complete Spectrum Cycle, Taylor and Francis Publishers – CRC Press, 2014. He has published more than 50 peer-reviewed journal papers and book chapters, 25 technical reports, 100 conference papers, and 4 invention disclosures. Since 1993 he gave more than 50 keynote talks, invited seminars and tutorials in various conferences and universities. He supervised 10 post-doctoral fellows and more than 15 PhD and 25 MSc students. He was the General Chair or Technical Chair of a number of international conferences including the Biennial Symposium on Communications (General Chair in 2010 and 2012). Dr. Ibnkahla received the INP Leopold Escande Medal for the year 1997, France, for his research contributions to signal processing; the prestigious Prime Minister's Research Excellence Award (PREA), Ontario, Canada in 2000, for his contributions in wireless mobile communications; and the Favorite Professor Award, Queen's University, in 2004 for his excellence in teaching. Dr. Ibnkahla is a Registered Professional Engineer (PEng) of the Province of Ontario, Canada.



Ali Imran, University of Oklahoma, USA

Ali Imran has been and is currently leading several multinational projects in CDSA and BSON as enablers for IoT, MTC and D2D, for which he has secured research grants of over \$2 million in last four years as a lead principal investigator. He is currently an assistant professor in Telecommunications Engineering Program in the School of Electrical and Computer Engineering, at The University of Oklahoma, where he is the founding director of Big Data Enabled Self-Organizing Research Center (www.bsonlab.com). At BSON lab he currently directs a team of 10+ postgraduate researchers. Before joining OU in Jan 2014, for three years he has worked as a Research Scientist in IoT at QMIC, in Qatar. Between Oct-2007 and Oct-2011, he has worked in the Centre for Communications Systems Research, (CCSR) University of Surrey, UK. In that position, he has contributed to a number of pan-European and international research projects while working in close collaboration with key industrial players such as NEC Europe Ltd. (UK), Telefónica (Spain), DOCOMO (Germany), Polska Telefonia Cyfrowa (Poland), Qualcomm (Germany), TTI (Spain), mimoOn (Germany), CTTC (Spain), CEA – LETI (France). Since March 2004, till Oct-2007 he has worked as a communication lab instructor, BS deployment team leader and RF consultant in leading telecom organizations in Pakistan. Dr. Imran's research interest include Big Data Empowered SON (BSON); and CDSA based aerial and terrestrial deployments as enablers for IoT, H2H, D2D and MTC. On these topics in past five years, he has published over 60 refereed journal and conference papers. He has been an invited speaker and served as a panellist on several international industrial fora on these topics. Currently, he is leading the development of next generation SON for 5G, which he dubs as BSON. Recently, he presented a vision of BSON as a key enabler for 5G in an IEEE Network special issue paper titled "Challenges in 5G: How to Empower SON with Big Data for Enabling 5G". This paper was selected to feature in TECH FOCUS on 5G. He is an Associate Fellow of Higher Education Academy (AFHEA), UK; president of ComSoc Tulsa Chapter; Member of Advisory Board for Special Technical Community on Big Data at IEEE Computer Society, and board member of ITERA.



Muhammad A. Imran, University of Surrey, UK

Muhammad Imran received his M.Sc. (Distinction) and Ph.D. degrees from Imperial College London, UK, in 2002 and 2007, respectively. He is currently a Professor in ECE at the University of Glasgow. He has leading a number of multimillion pounds international research projects encompassing the areas of Internet of Things, energy efficiency, fundamental performance limits, sensor networks and self-organizing cellular networks.

Before joining also leading the new physical layer work area for 5G innovation centre at Surrey (the 5G innovation centre and an outdoor cellular testbed are being developed at University of Surrey with a recent grant of above \$50m). He has a global collaborative research network spanning both academia and key industrial players in the field of wireless communications. He has supervised 17 successful Ph.D. graduates and published over 150 peer-reviewed research papers including more than 20 IEEE Journals. He has secured the funding of 3.2 million GBP in the last four years. His research interests include the derivation of information theoretic performance limits, energy efficient design of the cellular system and learning/self-organizing techniques for optimization of cellular system operation. He is a senior member of IEEE and a Fellow of Higher Education Academy (FHEA), UK. He is associate editor of IET Communications, guest editor of several special issues in IEEE journals and chair for several tracks in highly reputed international conferences and workshops. He has been awarded IEEE Comsoc's Fred Ellersick award 2014 and FEPS Learning and Teaching award 2014. He has also been shortlisted for Wharton-QS Stars Reimagine Education Awards 2014.



Sassan Iraj, Aalto University, Finland

Sassan Iraj [M'00, SM'05] received his Ph.D. degree from Tampere University of Technology, Finland, his M.Sc. (with distinction) from Aalto University, and his B.Sc. from Tehran University, Iran, all in electrical engineering, in 2005, 1999, and 1992, respectively. He served at Nokia from 1997 to 2012, holding various positions from senior research engineer to senior technology manager, principal researcher, and research leader. He was the founder of the Internet-of-Things

team at the Nokia Research Center, 2006–2008. He is currently with Aalto University as a research fellow, where he teaches, manages research projects, and guides graduate students. He has numerous patents and papers published in the field of wireless communications. His current research interests fall within the field of wireless communication systems toward 5G, IoT, and ultra-reliable low-latency communications. He is also one of the co-founders of Klick Technologies Ltd. (<http://www.klicktek.com>), a spin-off company from Aalto University that provides IoT solutions and adaptive gateways.



Omneya Issa, Innovation, Science, and Economic Development (ISED), Canada

Omneya Issa received the BSc and MSc, both in computer engineering, from Cairo University, and the PhD degree in telecommunications from the Institut National de la Recherche Scientifique, Montreal, Canada in 2004. From 2004 to 2008, she was a research scientist in International Institute of Telecommunications where she conducted R&D on multimedia applications for wireless and mobile technologies. Since

2008, she has been with the Communications Research Centre (CRC) Canada, where she is currently the team leader of multimedia communications. Her research interests include multimedia communication services, Quality of Service and video optimization for wireless and mobile telecommunications. She is also the BTS representative at the ITU-T IPTV-GSI.



Hamid Jafarkhani, Univ. California Irvine, USA

Hamid Jafarkhani is a Chancellor's Professor at the Department of Electrical Engineering and Computer Science, University of California, Irvine, where he is also the Director of Center for Pervasive Communications and Computing and the Coxant-Broadcom Endowed Chair. Dr. Jafarkhani ranked first in the nationwide entrance examination of Iranian universities in 1984. He was a co-recipient of the American Division Award of the 1995 Texas Instruments DSP Solutions Challenge. He received an NSF Career Award in 2003, the UCI Distinguished Mid-Career Faculty Award for

Research in 2006 and the School of Engineering Fariborz Maseeh Best Faculty Research Award in 2007. Also, he was a co-recipient of the 2002 best paper award of ISWC, the 2006 IEEE Marconi Best Paper Award in Wireless Communications, the 2009 best paper award of the Journal of Communications and Networks, the 2012 IEEE Globecom best paper award (Communication Theory Symposium), the 2013 IEEE Eric E. Sumner Award, and the 2014 IEEE Communications Society Award for Advances in Communication. He received the 2015-2016 School of Engineering Excellence in Research Senior Career Award and was an IEEE ComSoc Distinguished lecturer. He is listed as a highly cited researcher in <http://www.isihighlycited.com>. According to the Thomson Scientific, he is one of the top 10 most-cited researchers in the field of "computer science" during 1997-2007. He is a Fellow of AAAS, an IEEE Fellow, and the author of the book "Space-Time Coding: Theory and Practice."



Dushantha Nalin K. Jayakody, National Research Tomsk Polytechnic University, Russia

Nalin Jayakody, a Sri Lankan, received the B. Eng. degree (with first-class honors) from Pakistan and was ranked as the merit position holder of the University (under SAARC Scholarship). He was also ranked as the best foreign student in Pakistan. He received his MSc degree in Electronics and Communications Engineering from the Department of Electrical and Electronics Engineering, Eastern Mediterranean University, Cyprus (under

the University full graduate scholarship) and ranked as the first merit position holder of the department. He received the Ph. D. degree in Electronics and Communications Engineering, from the University College Dublin, Ireland under the supervision of Prof. Mark Flanagan (under the Science Foundation Ireland Grant). From 2014- 2016, he has held Postdoc position at the Coding & Information Transmission group, University of Tartu, Estonia and University of Bergen, Norway. From 2016, he is a Professor at the Department of Control System Optimization, Institute of Cybernetics, National Research Tomsk Polytechnic University, Russia. Dr. Jayakody is a Member of IEEE and he has served as session chair or technical program committee member for various international conferences, such as IEEE PIMRC 2014, IEEE WCNC 2014/2016, IEEE VTC 2015 etc.



Princy Johnson, Liverpool John Moores University, UK

Princy Johnson has received her PhD from King's College London. During her tenure at Nortel Networks UK Ltd. she had a patent issued for a novel re-configurable OADM. Her research interests include energy-efficient protocols for wireless sensor and mobile networks and biased random algorithms for resilience in heterogeneous networks and data fields. An avid collaborator and a registered PRINCE2® practitioner she has put together a cohesive collaborative team from across Europe and coordinated the consortium through research activities and various UK and EU funding application processes. She is an executive committee member of Rail Research UK Association (RRUKA) since September 2011. She has successfully completed several leadership training including the StellarHE leadership in 2014/15. She has been recognised as a senior fellow of the Higher Education Academy (SFHEA), UK in 2014.



Arun Kadavankandy, INRIA, France

Arun Kadavankandy is a PhD candidate with Inria/Eurecom Sophia Antipolis. His thesis topic is Spectral Graph Theoretic Applications in Graph Clustering and Sampling. He has taught a course on Random Walk techniques for Semi-supervised clustering at the Winter School on Complex Networks, Sophia Antipolis, 2017. He obtained Master's degree on Signal Processing from Indian Institute of Science, Bangalore.



Tamer Kadous, Qualcomm Research, USA

Tamer Kadous is the current Chair of the MulteFire Alliance Radio Working Group, technical lead for 5G shared spectrum and MulteFire (MF) Technologies in Qualcomm Research. Good part of Tamer's career has been working on wireless communication systems design and implementation spanning areas of physical, MAC, upper layers, and RF Systems. He has held the role of Design Architect, Systems Lead and Project

Lead for a variety of projects focusing on wireless innovations in WAN and connectivity areas including UMB (ultra-mobile broadband), WLAN, EV-DO, LTE, LTE-U, and MulteFire. His primary focus has been on end-to-end delivery of technology from design principals to performance evaluation, prototyping, standardization, and both base-station and terminal chipsets commercialization. A particular area of expertise for Tamer has been centered on systems algorithms facilitating coexistence between multiple technologies whether on the same or across devices. These algorithms have been adopted into a number of commercial products on LTE, LTE-U and MF. Tamer received his Ph.D. in wireless communications from the University of Wisconsin – Madison in 2001.



Burak Kantarci, University of Ottawa, Canada

Burak Kantarci (S'05-M'09-SM'12) received the M.Sc. and Ph.D. degrees in computer engineering from Istanbul Technical University, in 2005 and 2009, respectively. From 2014 to 2016, he was an Assistant Professor with the ECE Department, Clarkson University, where he currently holds a courtesy appointment as an Assistant Professor. He was a Visiting Scholar with the University of Ottawa, where he completed the major content of his thesis. He is currently an Assistant Professor

with the School of Electrical Engineering and Computer Science, University of Ottawa. He has co-authored over 100 papers in established journals and conferences, and contributed to 11 book chapters. He is a member of the ACM. He received the Siemens Excellence Award in 2005 for his studies in optical burst switching. He also serves as the Secretary of the IEEE ComSoc Communication Systems Integration and Modeling Technical Committee. He is an Editor of the IEEE Communications Surveys and Tutorials and an Area Editor of the IEEE Transactions on Green Communications and Networking.



Juha Karjalainen, Nokia Bell-Labs, Finland

Juha Karjalainen (S'03, M'10) received his M.Sc.(Tech.) and Dr.Sc degree in electrical engineering from University of Oulu, Finland, in 2001 and 2011. Currently, he is working at Nokia Networks, Finland, as a Senior Specialist. Before he joined to Nokia Networks, he was working with Samsung Electronics as a Principal Standards Engineer. Prior to that, he was working at Renesas Mobile as a Principal Researcher, and with University of Oulu as a Research Scientist and Project Manager as

well as Nokia Mobile Phones working as Senior Designer. His research interests include next generation mobile broadband communication systems, multi-antenna transceiver schemes and in- terference management.



Shuzo Kato, Tohoku Univ., Japan

Shuzo Kato received his Ph. D degree in electrical and communications engineering from Tohoku University, Sendai Japan in 1977. From 1977 to 1995, he worked at NTT (Nippon Telegraph and Telephone) Research Laboratories in Japan, specializing personal and satellite communications systems R&D. He and his team have developed 39 kinds of ASICs so far without re-spins including the world first TDMA chip set in 1986, the world fastest Viterbi decoder chips in 1987 and

1993, lowest power consumption ADPCM codec (0.5 mW) in 1994, best receiver sensitivity (6 dB improvement) and the world first 2 V operating CMOS SOC PHS baseband chip and many others. He founded Pacific Communications Research Corp. in 1995 and served as President of Uniden Corporation in 1997. From January 1998 to July 2001, he served as Executive Vice President, Mitsubishi Wireless Communications Inc (MWCI) in USA. From 2002 to 2005, he served as Executive Vice President of Teradyne Japan responsible for P/L, Engineering, Production and Global Marketing as well as President and CEO of Omni Wireless Inc., in USA. From 2006 to 2010, he served as Program Director / Coordinator, Ubiquitous Mobile Communications at NICT (National Institute of Information and Communications Technology) working on wireless communications systems R&D focusing on millimeter wave communications systems. He served as Vice-chair of IEEE802.15.3c Task Group working on millimeter wave systems standardization and Chair of COMPA (Consortium of Millimeter Wave Systems Practical Applications) promoting millimeter wave systems globally and contributed to establish IEEE802.15.3c Standard on multi-Gigabit/s millimeter wave systems in IEEE. He currently is Professor, Research Institute of Electrical Communications, Tohoku University, Japan focusing on wide area wireless sensor networks and 60 GHz communications systems. He has published

over 200 technical papers, held over 100 patents (including a patent which became DOD (Department of Defense, USA) standard in 1998), co-founded International Symposium on Personal Indoor and Mobile Radio Communications (PIMRC). He is a Fellow of the IEEE and IEICE Japan and served as an Editor of IEEE Transaction on Communications, Chairman of Satellite and Space Communications Committee, COMSOC IEEE, a Board Member of IEICE Japan.



Samian Kaur, Comcast Cable, USA

Samian Kaur is Senior Principal Engineer in the Wireless Engineering at Comcast, where she is working on the end-to-end network design and system architecture for Comcast's 5G deployment. Prior to Comcast, Mrs. Kaur has over 15+ years of extensive experience in the wireless industry, in standards (3GPP & IEEE), system and software design and development. Ms Kaur holds nearly 18 issued patents (60+ pending) in the communications field and author of several conference publications, standards contributions, and a book chapter. Mrs. Kaur holds a Masters in Technology Management from University of Pennsylvania (co-sponsored by Wharton), and a MS in Computer Engineering from Rutgers University.



Ali Khayrallah, Ericsson Research, Santa Clara, USA

Ali Khayrallah has been with Ericsson in various research positions, presently in Santa Clara, CA, where he is Engineering Director, and earlier in Research Triangle Park, NC. He leads a team shaping future wireless technology. He has contributed to the development of 5G, 4G, 3G, Bluetooth, mobile satellite etc. Previously, he was on the faculty of the University of Delaware. He received a Ph.D. and an M.S. from the University of Michigan, Ann Arbor, and a B.Eng. from the American University of Beirut. He holds 100+ patents and received the Ericsson inventor of the year award.



Evgeny Khorov, IITP RAS, Russia

Evgeny Khorov received his BS and MS degrees with honors from Moscow Institute of Physics and Technology (MIPT) in 2008 and 2010, respectively, and PhD degree in Telecommunications from Institute for Information Transmission Problems (IITP RAS) in 2012. Currently, he is a Team Leader and Senior Researcher at IITP RAS and Associate Professor at MIPT. Previously, he was Co-founder and Deputy Head of IoT Lab at Skolkovo Institute of Science and Technology. His

research interests include wireless networks, 5G, Internet of Things, multiple channel access, QoS provisioning, cross-layer optimization, and performance evaluation methods. He has developed numerous mathematical models of networking protocols and designed several solutions, which are described in over 50 paper. Some of the solutions are implemented in world-wide used networking equipment. Evgeny has led a number of national and international projects sponsored by academia foundations (RSF, RFBR, Ministry of Education) and industry. Being a member of IEEE 802.11 that develops and standardizes Wi-Fi, Evgeny Khorov has designed several improvements which were included in the 802.11ax standard aka High Efficiency WLANs. In 2015 Huawei RRC awarded him as the Best Cooperation Project Leader. Apart from that, he received Russian Government Science&Technology Prize in 2016, Moscow Government Prize for Young Scientists in 2013, and Best Paper Award at ISWCS 2012. Evgeny Khorov gives tutorials and participates in panels at large IEEE conferences (incl. ICC 2016, ISWCS 2014, BlackSeaCom 2017, etc.). He is an Executive Chair of WiFlex 2013, ITaS 2014-2016. He also serves as a reviewer for high-reputed scientific journals and conferences.



Abdallah Khreishah, New Jersey Institute of Technology, USA

Abdallah Khreisha received his Ph.D and M.S. degrees in Electrical and Computer Engineering from Purdue University in 2010 and 2006, respectively. Prior to that, he received his B.S. degree with honors from Jordan University of Science & Technology in 2004. During the last year of his Ph.D, he worked with NEESCOM. In Fall 2012, he joined the Electrical and Computer Engineering department of NJIT as an Assistant Professor. His research spans the areas of wireless networks,

visible-light communication, vehicular networks, congestion control, cloud & edge com-

puting, and network security. His research projects are funded by the National Science Foundation, New Jersey Department of Transportation, and the UAE Research Foundation. He is the chair of the IEEE EMBS North Jersey chapter.



Adrian Kliks, Poznan University of Technology, Poland

Adrian Kliks received his M.Sc. and PhD degree in Telecommunication from Poznan University of Technology in 2005 and 2011, respectively. Since 2005 he was employed at the Institute of Electronics and Telecommunications, and since 2007 at the Chair of Wireless Communication in the Faculty of Electronics and Telecommunication. He was hired first as the senior researcher (2007–2009), assistant (2009–2011) and starting from October 2011 is employed in the position of assistant professor. His research interests cover the wide spectrum of wireless communications. In particular he is interested in multicarrier (both orthogonal and non-orthogonal) systems, in the area of cognitive radios, small-cells and in radio-planning. Since 2007 to 2008 he was the chairman of the PhD Self-Government at the PUT. He was the originator of organization and the co-chairmen of the organizing committee at the First International Interdisciplinary Conference of Young Scientists InterTECH 2008. He was involved in preparation of national and international conferences, such as European Wireless 2012 conference (April 2012, Poznan, Poland), as well as workshops like CRAFT workshop at ISWCS 2013 and MACNET workshop at PIMRC2013. Currently he acts as one of the organizers of the workshop at IEEE WCNC 2014 (Istanbul, Turkey) on Interference and Design Issues for Future Heterogeneous Networks. For 9 years dr. Adrian Kliks is a member of IEEE, and from 2012 he reached the status of IEEE Senior Member. He was/is involved in industrial and international projects (like ICT-URANUS, COGEU, ACROPOLIS, COST Action IC-0902, COST-Terra), where he also acts/acted as the task leader. Within these projects he was awarded with international exchange grants (realized in University of Pisa and CTTC in Barcelona). He acts/acted also as a reviewer for various journals (e.g., IEEE Transactions on Wireless Communications, Wireless Personal Communications) and conference papers (e.g. IEEE Globecom, IEEE PIMRC, IEEE ICC, IEEE VTC). He organized various special sessions at international conferences (like CrownCom, WSA, Eusipco). Currently, he participates actively in working groups established for definition of IEEE 1900.x standards on cognitive radio. He is also the leading guest editor of the Special Issue on future heterogeneous networks that will be published at EURASIP Journal on Wireless Communications and Networking. From 2014 he acts as the Membership Development/Web Visibility Chair at the IEEE ComSoc Europe Middle East Africa (EMEA) region. From 25 November 2014 he is a member of Radio Communications Committee and Research Group on Software Defined and Virtualized Wireless Access.



Ryuji Kohno, Yokohama National University, Japan

Ryuji Kohno received the Ph.D. degree from the University of Tokyo in 1984. Since 1998 he has been a Professor and the Director of Centre on Medical Information and Communication Technology, in Yokohama National University in Japan. In his career he played a part-time role of a director of Advanced Telecommunications Laboratory of SONY CSL during 1998–2002, directors of UWB Technology and medical ICT institutes of NICT during 2002–2012. Since 2012 he is CEO of University of Oulu Research Institute Japan – CWC-Nippon Co. Since 2007 he has been a distinguished professor in University of Oulu in Finland and since 2014 a director of Kanagawa Medical Device Regulatory Science Centre. He was a member of the Board of Governors of IEEE Information Theory Society in 2000–2009, and editors of IEEE Transactions on Communications, Information Theory, and ITS. He was Vice-president of Engineering Sciences Society of IEICE during 2004–2005, Editor-in chief of the IEICE Trans. Fundamentals during 2003–2005.



Yiouli Kritikou, WINGS ICT Solutions, Greece

Yiouli Kritikou received her diploma degree in 2003 and her Ph.D. degree in 2009 from the Department of Digital Systems at the University of Piraeus. Since September 2003, she has been a research engineer at the University of Piraeus, Laboratory of Telecommunication Networks and Integrated Services. She also conducted a postdoc research in advanced services in the context of the future Internet. She has participated in numerous national and international projects. Her research in-

terests include design, specification, and development of services for wireless networks, concentrating on user profile, ubiquitous service delivery, and technoeconomic aspects of services delivery.



Witold Krzymien, Univ. Alberta, Canada

Witold A. Krzymien (M'79-SM'93-F'17) received the M.Sc. (Eng.) and Ph.D. degrees from the Poznan University of Technology, Poznan, Poland, in 1970 and 1978, respectively, both in electrical engineering. He received a Polish national award of excellence for his PhD thesis. Since April 1986 he has been with the Department of Electrical and Computer Engineering at the University of Alberta, Edmonton, Alberta, Canada, where he currently holds the endowed Rohit Sharma Professorship in Communications & Signal Processing. In 1986, he was one of the key research program architects of the newly launched TRLabs, which for a long time was Canada's largest industry-university-government pre-competitive research consortium in the Information and Communication Technology area. His research activity was closely tied to the consortium for the following three decades. Over the years he has also done collaborative research work with Nortel Networks, Ericsson Wireless Communications, TELUS Communications, Huawei Technologies, German Aerospace Centre (DLR - Oberpfaffenhofen) and the University of Padova (Italy). His research is currently focused on radio resource management and transceiver signal processing for broadband heterogeneous cellular networks employing multi-user MIMO and massive MIMO antenna techniques. He is an Editor of the IEEE Transactions on Vehicular Technology and a member of the Editorial Board of Wireless Personal Communications (Springer). From 1999 to 2005 he was the Chairman of Commission C (Radio Communication Systems and Signal Processing) of the Canadian National Committee of URSI (Union Radio Scientifique Internationale), and from 2000 to 2003 he was the Editor for Spread Spectrum and Multi-Carrier Systems of the IEEE Transactions on Communications. He was Co-Chair of the Technical Program Committee for IEEE VTC 2008-Fall and Co-Chair of the Technical Program Committees for 2005 and 2014 IEEE Communication Theory Workshops. He also co-chaired tracks and symposia of numerous international conferences. He is a Fellow of the IEEE, a Fellow of the Engineering Institute of Canada, and a licensed Professional Engineer in the Provinces of Alberta and Ontario, Canada.



Lutz Lampe, UBC, Canada

Lutz Lampe is a Professor with the Department of Electrical and Computer Engineering at UBC. He received Dr.-Ing. degree in electrical engineering from the University of Erlangen, Germany, in 2002. His research interests are broadly in theory and application of wireless, power line, optical and underwater acoustic communications. Dr. Lampe has received a number of UBC and international awards for his scholarly contributions. He has been an Associate Editor for several international journals, General Chair of the Smart Grid Communications, International Power Line Communications and Ultra-Wideband Communications conferences, and he is the present Co-Chair of the IEEE Communications Society Technical Sub-Committee on Smart Grid Communications. He is Co-Editor of the book Power Line Communications.



Ingmar Land, Huawei Technologies, France

Ingmar Land has joined the Huawei French Research Centre in December 2014 and is heading the Communication Algorithms Design. Previously he was Senior Research Fellow at the Institute for Telecommunications Research, University of South Australia, from 2007 to 2014, and Assistant Professor at Aalborg University, Denmark, from 2005 to 2006. He received his Dr.-Ing. (summa cum laude) in 2004 from the University of Kiel, Germany, and studied for his Dipl.-Ing. at the University of Ulm and the University of Erlangen-Nürnberg, Germany. He was recipient of four competitive research grants from the Australian Research Council. He has more than 60 scientific publications, including journal and conference papers, one book and one book chapter, and he holds several patents. He is Associate Editor of IEEE Wireless Communication Letters and has been on the TPC of leading international conferences on a regular basis. His main research interests are coding and information theory for future networks, with application to multi-user communications, cooperative communications, physical-layer security, and to distributed storage.



Andrés Laya, Ericsson Research, Sweden

Andrés is a PhD candidate in the Communication Systems department at KTH. He holds an MSc Degree in Information and Communication Technologies from UPC-BarcelonaTECH'09. At early research stage, he was involved in projects funded by the Spanish Ministry of Science and Technology, related to wireless technologies for control application in high-speed railway environments. He has been involved in Swedish and European projects together with Ericsson, Nokia, Orange, TeliaSonera, Aalto University, Telecom Italia, Sony Mobile and several SMEs in the area of Machine Type Communications, with focus on the transformation that MTC and IoT entail for different industries, considering the development of future communication technologies, as well as the corresponding business ecosystems in the creation of services based on connected devices. The latest research area has been in the contexts of health, homecare and wellbeing service in Sweden.



Long Bao Le, INRS, Canada

Long Bao Le (S'04–M'07–SM'12) received the B.Eng. degree (Hons.) from the Ho Chi Minh City University of Technology, Vietnam, in 1999, the M.Eng. degree from the Asian Institute of Technology, Pathumthani, Thailand, in 2002, and the Ph.D. degree from the University of Manitoba, Winnipeg, MB, Canada, in 2007. He was a PostDoctoral Researcher with the Massachusetts Institute of Technology (2008–2010) and University of Waterloo (2007–2008). Since 2010, he has been with the Institut National de la Recherche Scientifique, Université du Québec, Montréal, QC, Canada, where he is currently an Associate Professor. His current research interests include smartgrids, cognitive radio and dynamic spectrum sharing, radio resource management, network control, and optimization for wireless networks. He is a co-author of the book *Radio Resource Management in Multi-Tier Cellular Wireless Networks* (Wiley, 2013). He is a member of the Editorial Board of the IEEE COMMUNICATIONS SURVEYS AND TUTORIALS and the IEEE WIRELESS COMMUNICATIONS LETTERS. He has served as a Technical Program Committee Chair/Co-Chair for several IEEE conferences, including the IEEE WCNC, the IEEE VTC, and the IEEE PIMRC.



Tho Le-Ngoc, McGill University, Canada

Tho Le-Ngoc (F'97) received the B.Eng. degree (Hons.) in electrical engineering and the M.Eng. degree from McGill University, Montreal, QC, Canada, in 1976 and 1978, respectively, and the Ph.D. degree in digital communications from the University of Ottawa, Canada, in 1983. From 1977 to 1982, he was a Research and Development Senior Engineer with Spar Aerospace Ltd., Sainte-Anne-de-Bellevue, Canada, where he was involved in the development and design of satellite communications systems. From 1982 to 1985, he was the Engineering Manager of the Radio Group with the Department of Development Engineering of SRTelecom Inc., Saint-Laurent, QC, Canada, where he developed the new point-to-multipoint DA-TDMA/TDM Subscriber Radio System SR500. From 1985 to 2000, he was a Professor with the Department of Electrical and Computer Engineering, Concordia University, Montreal. Since 2000, he has been with the Department of Electrical and Computer Engineering, McGill University. His research interest is in the area of broadband digital communications. He is a fellow of the Engineering Institute of Canada, the Canadian Academy of Engineering, and the Royal Society of Canada. He is a recipient of the 2004 Canadian Award in Telecommunications Research, and the IEEE Canada Fessenden Award 2005. He holds a Canada Research Chair (Tier I) on Broadband Access Communications.



Jemin Lee, DGIST, South Korea

Jemin Lee received the B.S. (Hons.), M.S., and Ph.D. degrees in electrical and electronic engineering from Yonsei University, Seoul, South Korea, in 2004, 2007, and 2010, respectively. She was a Temasek Research Fellow with iTrust, Center for Research in Cyber Security, Singapore University of Technology and Design, Singapore, from 2014 to 2016, and a Post-Doctoral Fellow with the Massachusetts Institute of Technology, Cambridge, MA, from 2010 to 2013. She is currently an Assistant Professor with the Department of Information and Communication Engineering,

Daegu Gyeongbuk Institute of Science and Technology. Her current research interests include physical layer security, wireless security, heterogeneous networks, cognitive radio networks, and cooperative communications. She received the IEEE ComSoc Asia-Pacific Outstanding Young Researcher Award in 2014, the Temasek Research Fellowship in 2013, and the IEEE WCSP Best Paper Award in 2014. She served as a Guest Editor of the IEEE Wireless Communications, Special Issue on LTE in Unlicensed Spectrum, in 2016, and the ELSEVIER Physical Communication, Special Issues on Physical Layer Security in 2016 and Heterogeneous and Small Cell Networks in 2014. She is currently an Editor of the IEEE Transactions on Wireless Communications and the IEEE Communications Letters.



Jong-Hyook Lee, Sangmyung University, Korea

Jong-Hyook Lee received the M.S. and Ph.D. degrees in Computer Engineering from Sungkyunkwan University, Suwon, Korea, in 2007 and 2010, respectively. Dr. Lee was a researcher at INRIA, France and was an Assistant Professor at TELECOM Bretagne, France. Since September 2013, he has been with Sangmyung University, Cheonan, Korea. Dr. Lee won the Best Paper Award at the IEEE WiMob 2012 and received the 2015 Best Land Transportation Paper Award from the IEEE Vehicular Technology Society. Dr. Lee was a tutorial speaker at the IEEE WCNC 2013, IEEE VTC 2014 Spring, and IEEE ICC 2016. He was introduced as the Young Researcher of the Month by the National Research Foundation of Korea (NRF) Webzine in November 2014. He is an associate editor of Springer Annals of Telecommunications, IEEE TRANSACTIONS ON CONSUMER ELECTRONICS, and IEEE CONSUMER ELECTRONICS MAGAZINE. He is a general chair of Qshine 2016 and Technical Program Chair of the IEEE ICCE 2017 and IEEE ICCE 2018. Dr. Lee is an IEEE senior member. Research interests include blockchain, mobility management, malware analysis, and protocol analysis.



Victor Leung, UBC, Canada

Victor C. M. Leung is a Professor of Electrical and Computer Engineering and holder of the TELUS Mobility Research Chair at the University of British Columbia (UBC). His research is in the areas of wireless networks and mobile systems. He has co-authored more than 950 technical papers in archival journals and refereed conference proceedings, several of which had won best-paper awards. Dr. Leung is serving on the editorial boards of IEEE Transactions Green Communications and Networking, IEEE Wireless Communications Letters, IEEE Access, and several other journals. He has provided leadership to the technical program committees and organizing committees of numerous international conferences. Dr. Leung was the recipient of the 1977 APEBC Gold Medal, NSERC Postgraduate Scholarships from 1977–1981, a 2012 UBC Killam Research Prize, and an IEEE Vancouver Section Centennial Award. He is a Fellow of IEEE, the Royal Society of Canada, the Canadian Academy of Engineering and the Engineering Institute of Canada.



Geert Leus, Delft Univ. Techno., The Netherlands

Geert Leus was born in Leuven, Belgium, in 1973. He received his MSc degree in Electrical Engineering and the PhD degree in Applied Sciences from the Katholieke Universiteit Leuven (KUL), Belgium, in June 1996 and May 2000, respectively. He has been a Research Assistant and a Postdoctoral Fellow at the KUL from October 1996 till September 2003. During the summer of 1998, he visited Stanford University (with Prof. A. Paulraj), and from March 2001 till May 2002, he was a Visiting Researcher (with Prof. G. Giannakis) and Lecturer at the University of Minnesota. Currently, Professor Leus is a Full Professor at the Faculty of Electrical Engineering, Mathematics and Computer Science of the Delft University of Technology (TU Delft), The Netherlands. Professor Leus' research interests lie in the broad area of signal processing for communications and networking. Recently, he has been working on distributed signal processing for self organizing wireless networks, with applications in cognitive radio and sensor networks. The topics he addresses include energy efficiency, spectrum sensing, spectrum utilization and information processing. Professor Leus received numerous awards including a 2002 IEEE Signal Processing Society Young Author Best Paper Award and a 2005 IEEE Signal Processing Society Best Paper Award. He is an IEEE Fellow (for contributions in Signal Processing for Communications) and the Editor in Chief of the EURASIP Journal on Advances in Signal Processing. In the past, he served as the Chair of the IEEE Signal

Processing for Communications and Networking Technical Committee (SPCOM TC). He have also served on the Editorial Board of the IEEE Transactions on Signal Processing, the IEEE Transactions on Wireless Communications, the IEEE Signal Processing Letters, and the EURASIP Journal on Advances in Signal Processing. Currently, Professor Leus is a Member-at-Large to the Board of Governors of the IEEE Signal Processing Society and a member of the IEEE Sensor Array and Multichannel Technical Committee. He also serves as the Editor in Chief of the EURASIP Journal on Advances in Signal Processing.



Li Li, Communications Research Centre, Canada

Li Li is a Senior Research Scientist with the Communications Research Centre, a government of Canada's research lab. Dr. Li is currently the Program Coordinator for the research program on two grand challenges in CRC, the "Spectrum Environment Awareness" Grand Challenge and the "Make Better Use of Spectrum" Grand Challenge. Dr Li's research areas include spectrum sensing big data systems, spectrum data analytics for spectrum management, and wireless network protocols

and algorithms. Dr. Li has contributed to ITU-T, IETF and represented Canada in NATO's standard group on Line-of-Sight radio waveforms. She co-authored IETF RFC and NATO STANAG, and published in international conferences and journals. Li has served as Associate Editor for IEEE Transactions and as Track-Chair and TPC Member for various IEEE conferences. Before CRC, Dr. Li worked at Nortel Networks Ltd. as a System Architect and then as a Product Manager, and also at the SS8 Networks Ltd. as the Chief Product Architect.



Shao-Yu Lien, National Formosa University, Taiwan

Shao-Yu Lien received his B.S. degree from the Department of Electrical Engineering, National Taiwan Ocean University, in 2004, M.S. degree from the Institute of Computer and Communication Engineering, National Cheng Kung University, in 2006, and Ph.D. degree from the Graduate Institute of Communication Engineering, National Taiwan University, in 2011. After the military service, he joined the National Taiwan University as a postdoctoral fellow, and the Massachusetts Institute of

Technology (MIT), CA, as a visiting postdoctoral researcher in 2012. He has been with the Department of Electronic Engineering, National Formosa University, as an assistant professor since Feb. 2013, and as an associate professor since Feb. 2016. Dr. Lien received a number of prestigious research recognitions, including IEEE Communications Society Asia-Pacific Outstanding Paper Award 2014, Scopus Young Researcher Award (issued by Elsevier) 2014, URSI AP-RASC 2013 Young Scientist Award, and IEEE ICC 2010 Best Paper Award. His research interests lie in optimization techniques for communication networks.



Thomas D.C. Little, Boston University, USA

Thomas DC Little (S'82-M'83-SM'97) is Professor and Associate Dean in the Department of Electrical and Computer Engineering at Boston University. He is Associate Director of the NSF Center for Lighting Enabled Systems and Applications (formerly, the Smart Lighting Engineering Research Center). Dr. Little has been guest editor in several recent special issues including: IEEE Journal on Selected Areas in Communications, Special Issue on Localization, Communication, and Network-

ing with VLC (2017); Sensors – Special Issue on Image Sensor Based Optical Wireless Communications, 2016; IEEE Wireless Communications, Special Issue on Visible Light Communications 2014. He has also been a chair or co-chair of: Workshop on Visible Light Communication, at Optics Frontier The 8th Intl. Conf. on Information Optics and Photonics CIOP 2016; IEEE Summer Topicals, Visible Light Communications 2015; IEEE VTC 2015, Light-Based Communications and Positioning; 5th IEEE Workshop on Optical Wireless Communications 2014; Symposium on Optical Wireless Communications, 2014; 3rd IEEE Workshop on Optical Wireless Communications 2012. Dr. Little is a Senior Member of the IEEE and a member of the IEEE Computer and Communications Societies.



Lingjia Liu, Virginia Polytechnic Institute and State University, USA

Lingjia Liu received the Bachelor of Science (B.S.) degree with the highest honor in Electronic Engineering Department from Shanghai Jiao Tong University, Shanghai, China, and completed his Doctor of Philosophy (Ph.D.) degree at Texas A&M University in Electrical and Computer Engineering. He is now an Associate Professor at the Department of Electrical and Computer Engineering, Virginia Polytechnic Institute and State University. Prior to joining Virginia Tech, Prof. Liu was with the Department of EECS at University of Kansas from 2011-2017, and Standards Research Laboratory of Samsung Research America. Prof. Lingjia Liu has 40+ journal publications, 60+ conference papers, 15+ US granted patents, 30+ US patent applications, 10+ essential intellectual property rights (IPRs), and numerous technical contributions to major wireless standards including both 3GPP LTE/LTE-Advanced and IEEE 802.16m.



David Lopez-Perez, Nokia Bell Labs, Ireland

David López-Pérez (M'12, SM'17) is currently a member of Technical Staff at Nokia Bell Laboratories. Prior to this, David received the B.Sc. and M.Sc. degrees in telecommunication from Miguel Hernandez University, Spain, in 2003 and 2006, respectively, and the Ph.D. degree in wireless networking from the University of Bedfordshire, U.K., in 2011. David was also a RF Engineer with Vodafone, Spain, from 2005 to 2006, and a Research Associate with King's College London, U.K., from 2010 to 2011. David has authored the book Heterogeneous Cellular Networks: Theory, Simulation and Deployment (Cambridge University Press, 2012), as well as over 100 book chapters, journal, and conference papers, all in recognized venues. He also holds over 36 patents applications. David received the Ph.D. Marie-Curie Fellowship in 2007 and the IEEE ComSoc Best Young Professional Industry Award in 2016. He was also a finalist for the Scientist of the Year prize in The Irish Laboratory Awards in 2013 and 2015. He is an editor of IEEE TRANSACTION on WIRELESS COMMUNICATIONS since 2016 and he was awarded as Exemplary Reviewer of the IEEE COMMUNICATIONS LETTERS in 2011. He is or has also been a Guest Editor of a number of journals, e.g., the IEEE JOURNAL ON SELECTED AREAS IN COMMUNICATIONS, the IEEE Communication Magazine and the IEEE Wireless Communication Magazine.



Yves Lohan, ENGIE SIRADEL North America, Canada

Yves Lohan (IEEE SM'09) is Chief Technology Officer of SIRADEL (recently acquired by ENGIE) for wireless activities, leading the technology innovation for the related products and expert consulting. Yves is also CEO of SIRADEL North America, and is based in Toronto, Canada where he directly supervises the business development and strategic alliances in Canada and USA. Dr. Yves Lohan has more than 20 years-experience in delivering innovative products and consulting services to top-tier companies and stakeholders in the ICT, Energy, Broadcast & Media Industries. Dr Lohan is also an Adjunct Research Professor at University of Toronto (Faculty of Applied Science and Engineering), a Senior Executive Fellow at WISE (Waterloo Institute for Sustainable Energy, University of Waterloo, Canada) and a Senior Member of IEEE.



Jian Luo, Huawei Technologies Duesseldorf GmbH, Germany

Jian Luo (male) received the B.A. Sc. degree in communication engineering from South China University of Technology in 2004 and the M.S. and Ph.D. degrees in electrical engineering from Technische Universität Berlin, Germany, in 2006 and 2012, respectively. From 2007 to 2012, he was a researcher in the Fraunhofer Heinrich Hertz Institute in Berlin and has been involved in several German national and EU funded projects, e.g. EASY-A, SMART-RF and SAPHYRE. Since 2012 October, he has been with Huawei Technologies Duesseldorf GmbH, German Research Center, working on 5G wireless communication systems. He has been involved in EU 5GPPP projects METIS and mmMAGIC, where he has been leading the air-interface design. His current research focus include millimeter (mm)-wave channel measurement and modelling and mm-wave communication system design.



Irene Macaluso, Trinity College Dublin, Ireland

Irene Macaluso is a Research Fellow with the CTVR Telecommunications Research Group., based at Trinity College Dublin. His research focuses on cognitive radio and machine learning. In particular, she is interested in machine learning for dynamic spectrum access and resource management in wireless networks. In 2003 she obtained an MSc in Computer Engineering at the University of Palermo. His thesis was about the development of a computer vision system for controlling an anthropomorphic robotic hand. In 2007 she obtained a Ph.D. at University of Palermo in the Department of Computer Engineering. His thesis focused on the development of a robotic architecture for indoor museum tour-guide robots. In 2008 I joined CTVR Telecommunications Research Group, where she is currently working on learning approaches for reconfigurable wireless networks.



Toktam Mahmoodi, King's College London, United Kingdom

Toktam Mahmoodi is with the academic faculty of the centre for telecommunications research in King's College London. She is a member of the Tactile Internet Lab and principal and co-investigator on projects in 5G and SDN. Previously, Toktam was visiting research scientist at F5 Networks, post-doctoral research associate in Imperial College London, Mobile VCE researcher, and telecom R&D engineer. Her research focuses on the areas of mobile and cloud networking, and includes ultra-low latency networking, network virtualisation, mobility management, network modelling and optimisation. She also works on applications of mobile communications in the healthcare, smart cities, industrial networks and intelligent transportation.



Christian Makaya, IBM, USA

Christian Makaya is currently a researcher at IBM T.J. Watson Research Center, New York. Prior to joining IBM, he was a senior research scientist at Telcordia Technologies and a visiting researcher at Ericsson Research. His work has been a catalyst behind several new initiatives and technologies resulting in delivery of high-value capabilities to products and services. For his technical contributions, he has been recognized by several high-prestige internal awards by IBM. Dr. Makaya leads several technical research activities in the area of networking and distributed systems with the mission of delivering deep technical breakthroughs. The focus of his current research interests is on cloud computing, edge computing, network functions virtualization (NFV), software-defined networking (SDN), big data and analytics, Internet of Things (IoT), cognitive systems, and network security. Dr. Makaya has authored numerous technical papers in peer-reviewed journals and conferences, and is an inventor of several patents. He received his Ph.D. in Computer Engineering from Polytechnique Montreal (2007), University of Montreal. Dr. Makaya is an active member and volunteer of IEEE and serves on the Industry Outreach Board of IEEE Communication Society (ComSoc). He served as the co-chair of IEEE Young Professionals for IEEE Princeton/Central Jersey Section.



Mohamad Mantash, INRS, Canada

Mohamad Mantash (M'17) received the Master's Degree in Electronic and Microwaves Systems from Pierre and Marie Curie University (UPMC) - Paris VI, France, in 2010, and the Ph.D. degree in signal processing and Telecommunications from University of Rennes1, Rennes, France, in 2013. From 2014 to 2016, he was a research engineer with the Antennas and Microwaves Group, Institute of Electronic and Telecommunication of Rennes (IETR), Rennes, France. He is currently a Post-Doctoral Fellow with Institut National de la Recherche Scientifique (INRS), University of Quebec, Montreal, QC, Canada. His current research interests include metamaterials: FSSs, EBGs and AMCs for beamforming applications, reconfigurable antennas and the design and development of wearable antennas.



Sergio Toral Marín, University of Seville, Spain

Sergio Toral Marín (M'01–SM'06) received the Ph.D. degree in electrical and electronic engineering from the University of Seville, Seville, Spain. He is a Professor in the Department of Electronic Engineering at the University of Seville. His research interests include multiphase electrical machines, embedded operating systems, wireless sensor networks, and intelligent transportation systems.



Antonio Marques, King Juan Carlos Univ., Spain

Antonio G. Marques (SM'13) received the Telecommunications Engineering degree and the Doctorate degree, both with highest honors, from the Carlos III University of Madrid, Spain, in 2002 and 2007, respectively. In 2007, he became a faculty of the Department of Signal Theory and Communications, King Juan Carlos University, Madrid, Spain, where he currently develops his research and teaching activities as an Associate Professor. From 2005 to 2015, he held different visiting positions at the University of Minnesota, Minneapolis. In 2015 and 2016 he was a Visiting Scholar at the University of Pennsylvania. His research interests lie in the areas of communication theory, signal processing, and networking. His current research focuses on stochastic resource allocation for wireless networks and smart grids, nonlinear network optimization, and signal processing for graphs. He has served the IEEE in a number of posts and, currently, he is an Associate Editor of the IEEE Signal Processing Letters and member of the Technical Committee on Theory and Methods of the Signal Processing Society. Dr. Marques' work has been awarded in several conferences and workshops.



Belkacem Mouhouche, Samsung Electronics Research, UK

Belkacem Mouhouche received his Ph.D. degree in Signal Processing from L'Ecole Nationale Supérieure des Telecoms (TELECOM PARISTECH) in Paris, France. During his Ph.D. he worked on 3GPP third generation systems (UMTS). He later worked as a 3GPP standard Engineer following the development of HSDPA and LTE systems. He was also involved in FP7 European Project End to End Efficiency (E3) where he worked on cognitive radio in heterogeneous systems. Before joining Samsung he worked in major telecommunication companies like Sierra Wireless, Freescale Semiconductor, NEC and Alcatel Lucent. His research interests are in the areas of advanced techniques for the physical layer of future communication systems including MIMO, beamforming and coding applied to broadcast and broadband systems. Recently, he was involved in H2020 European Project Fantastic-5G and currently acts as the innovation manager of the second phase H2020 project 5G-Xcast.



Markus Mueck, Intel Mobile & Communications Group, Germany

Markus Mueck received the Engineering degrees from the University of Stuttgart, Stuttgart, Germany, and the École nationale supérieure des télécommunications (ENST), Paris, France, and the Doctorate degree in communications from ENST. He oversees Intel's technology development, standardization, and partnerships in the field of spectrum sharing. In this capacity, he has contributed to standardization and regulatory efforts on various topics such as spectrum sharing within numerous industry standards bodies, including the European Telecommunications Standards Institute (ETSI), Third-Generation Partnership Project, the IEEE, the Wireless Innovation Forum, and the European Conference of Postal and Telecommunications Administrations (CEPT). He is an Adjunct Professor of engineering with University of Technology, Sydney, Australia, and acts as an ETSI Board Member supported by Intel and as the general Chairman of the ETSI RRS Technical Body (Software Radio and Cognitive Radio Standardization).



Amit Mukhopadhyay, Bell Labs Consulting, USA

Amit Mukhopadhyay leads the Future Wireless Networks Practice in Bell Labs Consulting. He heads a team of experts building models for analyzing performance and economics of next generation networks. His team focuses on future wireless technologies, as well as various fixed broadband access technologies. Dr. Mukhopadhyay's research interests include architecture, performance and cost optimization for voice, data, and video infrastructure. He has worked with numerous operators around the world, advising them on selecting cost optimal evolution options for addressing traffic growth while preserving Quality of Service. He has 25+ years of experience in designing and optimizing various wireline, wireless and HFC cable networks. His current work focuses on next generation wireless technologies (LTE-Adv, 5G), including small cells, Heterogeneous Networks (HetNets) and SelfOrganizing Networks (SON) as well as Internet of Things (IoT). He is also deeply involved in converged IMS networks with other broadband access technologies including xDSL, Fiber and HFC Cable. He has experience of working on SS7, SIP and Diameter signaling as well as QoS requirements of various end-user applications. Prior to joining Bell Labs, he was with Ericsson in the Systems Engineering organization. He co-authored Ericsson's first Traffic Engineering Handbook for GSM networks. He was the editor of the GSM A-interface specifications for PCS 1900 standards under T1P1.5. He holds a Bachelor of Technology from Indian Institute of Technology, Kharagpur, India and a Ph. D. in Operations Research from the University of Texas, Dallas. He is a Senior Member of IEEE and received the IEEE Region 1 award. He has 20+ publications in refereed journals and has received seven patent awards. He serves on the college Accreditation Board for Engineering and Technology (ABET).



Yasser Nafei, LG Electronics, USA

Yasser Nafei currently serves as Senior Vice President and division head at LG Electronics. Dr. Nafei joined LG in 2010 and currently oversees sales, marketing and product management. In his current role, he is responsible for developing, communicating and executing LG strategy, business plans, product and technology roadmaps and go to market activities. Throughout his career, Dr. Nafei previously held senior management positions at Alcatel, IBM, Motorola, Nortel and Tellabs. His global assignments include research and development, technology strategy and mergers and acquisitions. Dr. Nafei holds a Bachelor's and a Masters' degrees in Electrical Engineering from Ain Shams University in Egypt, a Master of Science in Telecommunications from INRS Canada, and a Ph.D. in Organization Development from Benedictine University in the United States. He is the author of several business books including Corporate Dictatorship and Corporate Spring and a published writer and lecturer in corporate governance, business turnaround strategies, conflict management, customer advocacy and mergers & acquisitions.



Thrishantha Nanayakkara, Imperial College London, UK

Thrishantha Nanayakkara is the Head of the Robotics and Manufacturing Theme and a Reader in Design Engineering and Robotics at the Dyson School of Design Engineering, Imperial College London. Thrish has been a senior lecturer in robotics at King's College London, Radcliffe Fellow, Harvard University, USA, research affiliate at the Computer Science and Artificial Intelligence Laboratory, MIT, USA, and a research fellow in the department of Biomedical Engineering, Johns Hopkins University, USA. His research interests are in morphological computation, soft robotics, and human-robot interaction. For more information, please visit.



Keivan Navaie, Lancaster University, UK

Keivan Navaie received his Ph.D. in Electrical and Computer Engineering in 2004. From March to November 2004, he was with the School of Mathematics and Statistics, Carleton University, Ottawa, Canada, as a Postdoctoral Research Fellow. From December 2004 to September 2006, he was with the Broadband Communication and Wireless System (BCWS) Centre, Carleton University, Ottawa, Canada where he was the project manager of BCWS participation in European Union 6th Framework integrated project, the Wireless World Initiative New Radio (WINNER) on

beyond 3G wireless systems. From September 2006 to July 2011 he was with the Department of Electrical and Computer Engineering, TMU, Tehran, Iran, where he founded Wireless Innovation Laboratory based on a major research grant provided by the largest Iranian Mobile operator (MCI) for designing and implementing tools to obtain big data analytics and incorporate it in improving users' Quality of Experience. From July 2011 to January 2015 he was been with the School of Electrical and Computer Engineering, University of Leeds, Leeds, UK. He is currently with the School of Computing and Communications, Lancaster University, Lancaster, UK. He held visiting research scientist position in Telefonica Research and Innovation, Barcelona, Spain. During his academic career he taught a variety of graduate and undergraduate courses in Carleton University, Ottawa, Tehran University and TMU, Tehran, University of Leeds, and Lancaster University, UK. The taught courses include: Information Theory, Digital Communication Systems, Stochastic Processes, Convex Optimization and any more. He also presented crash courses on cellular network design, cloud computing and big data processing for the industry in the UK. His research interests lie in the field of wireless communications, smart cities, mobile computing, networking and green communications. He also works on wireless communication technologies including radio resource allocation for wireless communication systems, dynamic spectrum allocation, cognitive radio networks and cooperative communications. Dr. Navaie is a member of the editorial board of the IEEE Communications Survey and Tutorials. He has published more than 120 peer-reviewed journal articles, book chapters and conference papers and his works received more than 1400 citations. His paper, "Access strategies for spectrum sharing in fading environment: Overlay, underlay and mixed," was in the IEEE Communication Society Best readings on Cognitive Radio 2012. He has been on the technical program committee of different IEEE conferences, including Globecom, ICC, VTC and WCNC, and chaired some of their symposia. He has also served as Co-Chair of Wireless Network Track, IEEE VTC-2012 Yokohama, Japan, IEEE 8th International Workshop on Wireless Network Measurements WinMee 2012, Paderborn, Germany, IEEE, Wireless Networks and Security Track, IEEE VTC2014-Spring, Seoul, South Korea, the Mobile and Wireless Networks Track, IEEE WCNC 2014, Istanbul, Turkey. He is the recipient of the 2011 IEEE Iran Section Young Investigator award. Dr. Navaie is a Senior Member of the IEEE, and a Chartered Engineer in the UK.



Wing Kwan Ng, Univ. New South Wales, Australia

Derrick Wing Kwan Ng [S'06-M'12] received the bachelor degree with first class honours and the Master of Philosophy (M.Phil.) degree in electronic engineering from the Hong Kong University of Science and Technology (HKUST) in 2006 and 2008, respectively. He received his Ph.D. degree from the University of British Columbia (UBC) in 2012. In the summer of 2011 and spring of 2012, he was a visiting scholar at the Centre Tecnologic de Telecommunicacions de Catalunya - Hong Kong (CTTC-HK). He was a senior postdoctoral fellow at the Institute for Digital Communications, Friedrich-Alexander-University Erlangen-Nurnberg (FAU), Germany. He is now working as a Lecturer at the University of New South Wales, Sydney, Australia. His research interests include convex and non-convex optimization, physical layer security, wireless information and power transfer, and green (energy-efficient) wireless communications. Dr. Ng received the Australian Research Council's Discovery Early Career Researcher Award (DECRA) in 2017. He also received the Best Paper Awards at the IEEE International Conference on Computing, Networking and Communications (ICNC) 2016, IEEE Wireless Communications and Networking Conference (WCNC) 2012, the IEEE Global Telecommunication Conference (Globecom) 2011, and the IEEE Third International Conference on Communications and Networking in China 2008. He was awarded the IEEE Student Travel Grants for attending the IEEE WCNC 2010, the IEEE International Conference on Communications (ICC) 2011, and the IEEE Globecom 2011. He was also the recipient of the 2009 Four Year Doctoral Fellowship from the UBC, Sumida & Ichiro Yawata Foundation Scholarship in 2008, and R&D Excellence Scholarship from the Center for Wireless Information Technology in HKUST in 2006. He has served as an editorial assistant to the Editor-in-Chief of the IEEE Transactions on Communications since Jan. 2012. He is currently an Editor of the IEEE Communications Letters, the IEEE Transactions on Wireless Communications, and the IEEE Transactions on Green Communications and Networking. He was a Co-Chair for the Wireless Access Track of 2014 IEEE 80th Vehicular Technology Conference. He has been a TPC member of various conferences, including the Globecom, WCNC, ICC, VTC, and PIMRC, etc. He was honoured as an Exemplary Reviewer of the IEEE Transactions on Communications in 2015, the top reviewer of IEEE Transactions on Vehicular Technology in 2014, and an Exemplary Reviewer of the IEEE Wireless Communications Letters for 2012, 2014, and 2015.



Kim Khoa Nguyen, ETS, Canada

Kim Khoa Nguyen is an Assistant Professor at the Department of Electrical Engineering of the University of Quebec's Ecole de Technologie Supérieure – the largest engineering university in Canada. In the past, he worked for Alcatel Systems (Alcatel-Lucent) and a nationwide operator in Asia-Pacific, as well as for HyperChip in Montreal – the world's pioneer in next-generation petabit router, and Inocybe Technologies. He was an architect and key developer of the GreenStar Network, the world's first neutral-carbon network of green datacenters, funded by CANARIE, and led R&D in several research projects funded by Ericsson, Ciena, Varitron, and Inocybe, as well as Canadian government. His expertise includes software-defined networking (SDN), network virtualization virtualization (NFV), Internet of Things (IoT), cloud computing, big data, datacenter architecture, high speed routing and switching, wireless networking, M2M communications and green ICT. He holds several industrial patents and has published more than 50 scientific papers in the field.



Kai Niu, BUPT, China

Kai Niu received a B.S. in information engineering and a Ph.D. in signal and information processing from Beijing University of Posts and Telecommunications (BUPT) in 1998 and 2003 respectively. Then he joined the Information Theory and Technique Center, BUPT. Currently he is a professor in School of Information and Communication Engineering, BUPT. He is a senior member of Chinese Institute of Electronics. Professor Niu's research areas of interests include: polar code, iterative signal processing, MIMO signal processing. He published 200+ papers and held 36 China patents in the fields of polar coding, iterative decoding and MIMO detection.



Luc Noiseux, Cogeco, Canada

Luc Noiseux was named Senior Vice President and Chief Technology and Strategy Officer in August 2016. He has more than 20 years of broad experience in communications, defining and promoting vision, leading execution, and delivering large, cutting-edge technology programs to market. Most recently, he was Vice President Research & Development at Accedian Networks, responsible for the Chief of Technology office and for product development. Previously, Mr. Noiseux also held several senior management roles at Alcatel-Lucent. He holds a Master's degree in Mathematics and Telecommunications from the Université du Québec's Institut national de la recherche scientifique (INRS) as well as a dual eMBA from the Université du Québec à Montréal and the Université Paris Dauphine.



Ayça Özçelikkale, Uppsala University, Sweden

Ayça Özçelikkale received the B.Sc. degree in electrical engineering and the double major B.A. degree in philosophy from Middle East Technical University, Turkey, and the M.S. and Ph.D. degrees in Electrical Engineering from Bilkent University, Turkey. She spent part of her doctoral studies at Department of Mathematics and Statistics, Queen's University, Canada. After her Ph.D., she was a postdoctoral researcher at Department of Electrical Engineering, Chalmers University, Sweden. She is now an Associate Senior Lecturer at Division of Signals and Systems, Uppsala University, Sweden. Her research interests are in the areas of statistical signal processing, communications, optimization and energy harvesting systems.



Kaveh Pahlavan, WPI, USA

Kaveh Pahlavan is currently a Professor of Electrical and Computer Engineering, a Professor of Computer Science, and Director of the Center for Wireless Information Network Studies, Worcester Polytechnic Institute, Worcester, MA, USA. He is widely recognized as one of the pioneering visionaries and researchers of Wi-Fi technology and wireless indoor geolocation. He has contributed to numerous seminal technical and visionary publications and patents and he has worked closely with a number of companies and government agencies. He has authored several books

in the area of wireless networks. His current area of research is wireless access and localization for body area networks with a focus on localization and mapping for wireless video capsule endoscope inside the human gastrointestinal tract.



Ashish Pandharipande, Philips Lighting, The Netherlands

Ashish Pandharipande (S'97–AM'98–M'03– SM'08) received the M.S. degrees in electrical and computer engineering and mathematics, and the Ph.D. degree in electrical and computer engineering from the University of Iowa, Iowa City, IA, USA, in 2000, 2001, and 2002, respectively. He has held positions at AT&T Laboratories, University of Florida, Gainesville, FL, USA, Samsung Advanced Institute of Technology, Indian Institute of Science, and Nanyang Technological University, Singapore. Since 2006, he has been a senior scientist at Philips Research, and currently Philips Lighting, Eindhoven, the Netherlands. He is an Associate Editor for the IEEE Transactions on Signal Processing, IEEE Signal Processing Letters, and the IEEE Sensors Journal, an Editor of EURASIP Journal on Wireless Communications and Networking, and a member of the International Advisory Board, Lighting Research & Technology. His research interests are in data analytics, sensing, networking and controls, and system applications in domains like connected smart lighting, energy monitoring and control, and cognitive spectrum sharing.



Stefan Parkvall, Ericsson, Sweden

Stefan Parkvall is a Principal Researcher at Ericsson Research, working with 5G and future radio access. He is one of the key persons in the development of HSPA, LTE and LTE-Advanced radio access, has been deeply involved in 3GPP standardization for many years, and has numerous patents in the area of mobile communication. Dr Parkvall is a senior member of the IEEE and served as an IEEE Distinguished lecturer 2011-2012. He received Ericsson "Inventor of the Year" award in 2005, the Swedish government's Major Technical Award for his contributions to the success of HSPA in 2009, and was nominated with colleagues as finalists for the European Inventor Award in 2014 for contributions to LTE. Dr Parkvall holds a Ph.D. in electrical engineering from the Royal Institute of Technology (KTH) in Stockholm, Sweden. Previous positions include assistant professor in communication theory at KTH, and visiting researcher at University of California, San Diego, USA.



Benoît Pelletier, InterDigital, Canada

Benoît Pelletier received his Ph.D. degree in Telecommunications and Signal Processing in 2007 from McGill University, Montréal, Canada. As system design engineer for InterDigital Canada Ltée., he has contributed from 2007 to 2011 to the evolution of HSPA/HSPA+ systems, specializing in L1/L2 protocol design aspects. Now Member of Technical Staff, his current work focuses on the evolution of LTE and on the design of 5G wireless systems. In addition to being an author on numerous peer-reviewed journal and conference publications, he also holds over 40 granted patents and 100 patent applications. He co-organized the Device-to-Device Wireless Communications for Mobile Cellular Network workshop at ICC 2015, acted as TPC for the Globecom Workshop on Device-to-Device (D2D) Communication With and Without Infrastructure and as a reviewer for IEEE conferences and journals. His current research interests include 5G system design, device-to-device communications, vehicular communications, Hybrid-ARQ and statistical signal processing.



Michael Rahaim, Boston University, USA

Michael Rahaim is a Postdoctoral Researcher at Boston University. Beginning September 2017, he will be taking a position as an Assistant Professor at University of Massachusetts, Boston. During his Ph.D. and Postdoctoral tenure at Boston University, he has been part of the NSF funded Engineering Research Center for Lighting Enabled Systems and Applications where his research has focused primarily on heterogeneous network integration of RF and optical wireless networks. Dr. Rahaim is a member of IEEE and of the IEEE Communications Society.



Rapeepat Ratasuk, Nokia Corporation, USA

Rapeepat Ratasuk received the Ph.D. degree in electrical engineering from Northwestern University, Evanston, IL, USA, in 2000. He is currently a Principal Research Specialist with the North American Radio Systems Research Group, Technology and Innovation Office, Nokia Networks, Arlington Heights, IL. He has extensive experience in 3G/4G cellular system design and analysis, including algorithm development, performance analysis and validation, physical-layer modeling, and simulations. He is a coauthor of the book titled *Essentials of LTE and LTE-A*. He has more than 35 issued patents and more than 40 journal and conference papers. His current research interests are in the areas of wireless and machine-to-machine communications.



Ronald Raulefs, Institute of Communications and Navigation of the German Aerospace Center (DLR), Germany

Ronald Raulefs received the Dipl.-Ing. degree from the University of Kaiserslautern, Germany, in 1999 and the Dr.-Ing. (PhD) degree from the University of Erlangen-Nuremberg, Germany, in 2008. He is working as senior research member at the Institute of Communications and Navigation of the German Aerospace Center (DLR) in Oberpfaffenhofen, Germany. Ronald Raulefs initiated and lead the EU FP7 project WHERE and its successor project WHERE2 (www.ict-where2.eu) as well as the task on cooperative location and communications in heterogeneous networks. He has taught courses on the cooperation between wireless communications and positioning systems. He held tutorials at the VTC'09, Sarnoff Symposium (2010), Summer school of WHERE/WHERE2 (2010), European Wireless (2013), ICC'13, Winter school Newcom#1/IC 1004 (2013). He authored and co-authored 80+ scientific publications in conferences and journals. Currently he is the rapporteur of the ETSI RRS WG1 work item on a feasibility study of a radio engine for future systems. His current research interests include various aspects of mobile radio communications and positioning, including cooperative positioning for future cellular communication systems.



Danda B. Rawat, Howard University, Canada

Danda B. Rawat is an Associate Professor in the Department of Electrical Engineering & Computer Science at Howard University, Washington, DC, USA. Prior to Howard University, he was with the College of Engineering & Information Technology of Georgia Southern University, Statesboro, GA as a faculty member. Dr. Rawat's research focuses on wireless communication networks, cyber security, cyber physical systems, Internet of Things, big data analytics, wireless virtualization, software-defined networks, smart grid systems, wireless sensor networks, and vehicular/wireless ad-hoc networks. His research is supported by US National Science Foundation, University Sponsored Programs and Center for Sustainability grants. Dr. Rawat is the recipient of NSF Faculty Early Career Development (CAREER) Award in 2016. He has been serving as an Editor/Guest Editor for over 15 international journals. He serves as a TPC Vice-Chair (Information Systems) for IEEE INFOCOM 2018, served as a Web-Chair for IEEE INFOCOM 2016/2017 and as a Student Travel Grant Co-chair of IEEE INFOCOM 2015, Track Chair for Wireless Networking and Mobility of IEEE CCNC 2016, Track Chair for Communications Network and Protocols of IEEE AINA 2015, and so on. He served as a program chair, general chair, and session chair for numerous international conferences and workshops, and served as a technical program committee (TPC) member for several international conferences including IEEE INFOCOM, IEEE GLOBECOM, IEEE CCNC, IEEE GreenCom, IEEE AINA, IEEE ICC, IEEE WCNC and IEEE VTC conferences. He is the recipient of Outstanding Research Faculty Award (Award for Excellence in Scholarly Activity) 2015, Allen E. Paulson College of Engineering and Technology, GSU among others. He is the Founder and Director of the Cyber-security and Wireless Networking Innovations (CWNI) Research Lab at Howard University. He received the Ph.D. in Electrical and Computer Engineering from Old Dominion University, Norfolk, Virginia. Dr. Rawat is a member of ACM and ASEE. He served as a Vice Chair of the Executive Committee of the IEEE Savannah Section and Webmaster for the section from 2013 to 2017.



Catherine Rosenberg, University of Waterloo, Canada

Adam T. Drobot is a technologist with management expertise and over forty years of experience with business, government, and academia. Today his activities include strategic consulting, start-ups, and participation in industry associations and government advisory bodies. He is the Chairman of the Board of OpenTechWorks, Inc. a company specializing in open source software. Previously he was the Managing Director and CTO of 2M Companies in Dallas, TX, from 2010-2012, and President of the Applied Research and Government Business Units at Telcordia Technologies and the company's CTO from 2002 to 2010. Prior to that, Adam managed the Advanced Technology Group at Science Applications International Corporation (SAIC). He also served as Senior Vice President for Science and Technology as part of his 27 years of service at SAIC from 1975 to 2002. Adam has been the principal or key participant in the development of several large, scientific code systems and software for managing the design and production of complex platforms. He has published more than 100 journal articles, and is a frequent contributor to industry literature. He currently holds 26 patents. Adam is the 2007 recipient of IEEE's Managerial Excellence Award. He is currently a member of Several Corporate Boards, the FCC Technology Advisory Council, and he also Chairs the Awards Recognition Council for the IEEE and the IEEE IoT Activities Board. Adam is on the Board of the Telecommunications Industry Association and Chairs the TIA Technology Committee. He holds a BS in Engineering Physics from Cornell University and a PhD. in Plasma Physics from the University of Texas.



Arnab Roy, InterDigital Communications, USA

Arnab Roy received his B.E. degree in Electronics Engineering from University of Mumbai, India, and his M.S. and Ph.D. degrees in Electrical Engineering from Penn State University. Since 2011 he is with InterDigital, Inc. where he has been involved in technology development for next generation cellular and Wireless Local Area Networks industries. Earlier he was an intern at Agere Systems and LSI Technologies, both in Allentown, PA, and also at Mitsubishi Electric Research Laboratories in Cambridge, MA. He has over 15 US patents issued or pending. Dr. Roy has authored several journal papers, conference proceedings and a book chapter in the fields of signal processing and wireless communications. His current interests are in the areas of millimeterwave communications, cellular technologies in unlicensed spectrum and Internet of Things (IoT).



Walid Saad, Virginia Polytechnic Institute and State University, USA

Walid Saad received his B.E. degree in Computer and Communications Engineering from the Lebanese University, in 2004, his M.E. in Computer and Communications Engineering from the American University of Beirut (AUB) in 2007, and his Ph.D. degree from the University of Oslo in 2010. Currently, he is an Associate Professor at the Electrical and Computer Engineering Department at Virginia Polytechnic Institute and State University. From 2015 – 2017, Dr. Saad was an Assistant Professor and the Stephen O. Lane Junior Faculty Fellow at Virginia Tech. Dr. Saad leads the Network Science, Wireless, and Security group, that is part of the Wireless@VT Laboratory. In 2017, he was named as College of Engineering Faculty Fellow for excellence in research and teaching. Prior to joining VT, he was an Assistant Professor at the Electrical and Computer Engineering Department at the University of Miami and he has held several research positions at institutions such as Princeton University and the University of Illinois at Urbana-Champaign. His research interests include wireless networks, unmanned aerial vehicles communications, game theory, security and cyber-physical systems. He has co-authored three books and over 222 international conference and journal publications in these areas. In 2013, Dr. Saad received the NSF CAREER award for his research on self-organizing wireless systems and he received the ONR Young Investigator Award in 2015 for his work on machine-to-machine communications. He was the author/co-author of the papers that received the Best Paper Award at the 7th International Symposium on Modeling and Optimization in Mobile, Ad Hoc and Wireless Networks (WiOpt), in June 2009, at the 5th International Conference on Internet Monitoring and Protection (ICIMP) in May 2010, at IEEE WCNC in 2012, at IEEE PIMRC in 2015, and IEEE SmartGridComm in 2015. He is the recipient of the IEEE Communications Society (ComSoc) Fred W. Ellersick Prize for best

magazine paper in 2015.



Ayman Sabbah, Communications Research Centre, Canada

Ayman Sabbah received his PhD degree in Electrical and Computer Engineering from Queen's University, Kingston, Canada, in 2015 with GPA of 4.0. He got his Master degree in wireless communications engineering from Jordan University of Science and Technology (JUST), Jordan in 2010 with summa cum laude. Dr. Sabbah received many scholarships including, Queen's University scholarship, DAAD scholarship, and Hani Qaddumi Scholarship. Currently, Dr. Sabbah is the

technical manager of NSERC/Cisco Industrial Research Chair (IRC) in sensor networks for the Internet of Things (IoT) in systems and computer engineering department at Carleton University, Ottawa, Canada, with considerable experience in research, algorithms development, problem-solving, and leadership. He is also the team leader of a project in collaboration with Communication Research Centre (CRC)- Innovation, Science, and Economic Development (ISED) Canada



Abdelaziz Samet, INRS, 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.



Luca Sanguinetti, University of Pisa, Italy

L. Sanguinetti is an Assistant Professor in the Dipartimento di Ingegneria dell'Informazione of the University of Pisa. He received the Telecommunications Engineer degree (cum laude) and the Ph.D. degree in information engineering from Pisa University, Italy, in 2002 and 2005. In 2004, he was a visiting Ph.D. student at the German Aerospace Center (DLR), Oberpfaffenhofen, Germany. During the period June 2007 -- 2008, he was a postdoctoral associate in the Department of

Electrical Engineering at Princeton. Since July 2013, he is also with Centrale Supélec, Paris, France. He is serving as an Associate Editor for IEEE Trans. Wireless Commun. and IEEE Signal Process. Lett. He is the Lead Guest Associate Editor for IEEE JSAC --- Game Theory for Networks. From June 2015 to June 2016, he was in the editorial board of IEEE JSAC --- Series on Green Commun. and Networking. Dr. Sanguinetti served as Exhibit Chair of ICASSP14 and as the general co-chair of the 2016 Tyrrhenian Workshop on 5G&Beyond. His expertise and general interests span the areas of communications and signal processing with special emphasis on multiuser MIMO, game theory and random matrix theory for wireless communications. He was the co-recipient of 2 best paper awards: IEEE Wireless Commun. and Networking Conference (WCNC) 2013 and IEEE Wireless Commun. and Networking Conference (WCNC) 2014. He was also the recipient of the FP7 Marie Curie IEF 2013 "Dense deployments for green cellular networks". Dr. Sanguinetti is a Senior IEEE Member.



Hikmet Sari, Sequans Communications and NUPT, China

Hikmet Sari is currently Chief Scientist at Sequans Communications and Professor at Nanjing University of Posts and Telecommunications (NUPTE). From 2003 to 2016, he was Professor and Head of the Telecommunications Department at Supélec. Previously, he held various research and management positions at Philips, SAT (SAGEM Group), Alcatel, Pacific Broadband Communications, and Juniper Networks. He received his Engineering Diploma and Ph.D. from the ENST, Paris, and the Habilitation degree from the University of Paris-Sud. His distinctions include

the IEEE Fellow Grade and the Blondel Medal in 1995, the Edwin H. Armstrong Achievement Award in 2003, the Harold Sobol Award in 2012, and election to the European Academy and to the Science Academy of Turkey in 2012. Dr. Sari has served the IEEE Communications Society in numerous volunteer and leadership positions including Vice President - Conferences, Distinguished Lecturer, Member of the IEEE Fellow Evaluation Committee, Member of the Awards Committee, Member of several Technical Committees, Chair of the GTC, Chair of the Communication Theory Symposium of ICC 2002, Technical Program Chair of ICC 2004, Executive Chair of ICC 2006, General Chair of PIMRC 2010, General Chair of WCNC 2012, Executive Chair of WCNC 2014, Executive Co-Chair of ICC 2016, Executive Chair of ICC 2017, Editor of the IEEE Transactions on Communications, Associate Editor of the IEEE Communications Letters, and Guest Editor of IEEE JSAC. He also served as General Chair of ICUWB 2014, Technical Program Chair of EuCNC 2015, and General Co-Chair of ATC 2016.



Kamran Sayrafian, NIST, USA

Kamran Sayrafian-Pour (S'96-M'98-SM'06) received the Ph.D. degree in electrical and computer engineering from the University of Maryland, College Park, MD, USA, in 2000. He is currently a Senior Scientist with the Information Technology Laboratory, National Institute of Standards and Technology, Gaithersburg, MD, USA, where he leads a strategic program related to the application of Pervasive Technology in Health Care Information Systems. Prior to this, he was the Co-Founder

of Zagros Networks, Inc., Rockville, MD (a fabless semiconductor company), where he served as a President and a Senior Member of the Architecture Team. He has been an Adjunct Faculty Member with the University of Maryland since 2003. He has authored over 100 conference and journal papers and book chapters. He is the Co-Inventor/Inventor of four U.S. patents. His research interests include medical body area networks, mobile sensor networks, and radio frequency-based indoor positioning. Dr. Sayrafian-Pour was the Technical Program Committee (TPC) and Executive Co-Chair of the IEEE International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC) 2014. He has also been the Organizer and invited TPC Member of several IEEE ComSoc conferences and workshops focused on the applications of wireless communication in health care. He is also a Member of the Editorial Board of IEEE WIRELESS COMMUNICATIONS MAGAZINE, and a Guest Editor for a number of journal special issues focusing on the pervasive health care technologies and wireless sensor networks. He was the U.S. Embassy Science Fellow in Croatia in 2014. He was a Contributing Member of the European European Cooperation in Science and Technology (COST) Action IC1004 "Cooperative Radio Communications for Green Smart Environments," and his research results have been included in the final report of this Action. He was also a Contributing Member and the Co-Editor of the channel modeling document of the IEEE802.15.6 international standard on body area networks. He was the recipient of the IEEE PIMRC 2009 and The International Conference on Sensor Technologies and Applications (SENSORCOMM) 2011 Best Paper Awards. He was also the recipient of the 2015 U.S. Department of Commerce Bronze Medal Award for his contribution to the field of body area networks.



Robert Schober, Univ. Erlangen-Nuremberg, Germany

Robert Schober (S'98-M'01-SM'08-F'10) was born in Neuendettelsau, Germany, in 1971. He received the Diplom (Univ.) and the Ph.D. degrees in electrical engineering from the University of Erlangen-Nuremberg, Erlangen, Germany, in 1997 and 2000, respectively. From May 2001 to April 2002 he was a Postdoctoral Fellow at the University of Toronto, Canada, sponsored by the German Academic Exchange Service (DAAD). Since May 2002 he has been with the University of

British Columbia (UBC), Vancouver, Canada, where he is now a Full Professor. Since January 2012, he has been an Alexander von Humboldt Professor and the Chair for Digital Communication at the Friedrich Alexander University (FAU), Erlangen, Germany. His research interests fall into the broad areas of Communication Theory, Wireless Communications, and Statistical Signal processing. Dr. Schober is a Fellow of the Canadian Academy of Engineering and a Fellow of the Engineering Institute of Canada. From 2012 to 2015, he served as Editor-in-Chief of the IEEE TRANSACTIONS ON COMMUNICATIONS. He is currently the Chair of the Steering Committee of the IEEE TRANSACTIONS ON MOLECULAR, BIOLOGICAL AND MULTISCALE COMMUNICATION and a Member-at-Large on the Board of Governors of the IEEE Communication Society. He was the recipient of several awards for his work, including the 2002 Heinz Maier Leibnitz Award of the German Science Founda-

tion (DFG), the 2004 Innovations Award of the Vodafone Foundation for Research in Mobile Communications, the 2006 UBC Killam Research Prize, the 2007 Wilhelm Friedrich Bessel Research Award of the Alexander von Humboldt Foundation, the 2008 Charles McDowell Award for Excellence in Research from UBC, a 2011 Alexander von Humboldt Professorship, and a 2012 NSERC E.W.R. Steacie Fellowship. In addition, he received best paper awards from the German Information Technology Society (ITG), the European Association for Signal, Speech and Image Processing (EURASIP), the IEEE ICC 2016, IEEE WCNC 2012, IEEE Globecom 2011, IEEE ICUWB 2006, the International Zurich Seminar on Broadband Communications, and European Wireless 2000.



Shree Krishna Sharma, Western University, Canada

Shree Krishna Sharma (S'12-M'15) received the M.Sc. degree in information and communication engineering from the Institute of Engineering, Pulchowk, Nepal; the M.A. degree in economics from Tribhuvan University, Nepal; the M.Res. degree in computing science from Staffordshire University, Staffordshire, U.K.; and the Ph.D. degree in Wireless Communications from University of Luxembourg, Luxembourg in 2014. Dr.

Sharma worked as a Research Associate at Interdisciplinary Centre for Security, Reliability and Trust (SnT), University of Luxembourg for two years, where he was involved in EU FP7 CoRaSat project, EU H2020 SANSa, ESA project ASPIM, as well as Luxembourgish national projects Co2Sat, and SeMIGod. He is currently working as a Postdoctoral Fellow at Western University, Canada. His research interests include Internet of Things (IoT), cognitive wireless communications, Massive MIMO, Intelligent small cells, and 5G and beyond wireless systems. In the past, Dr. Sharma was involved with Kathmandu University, Dhulikhel, Nepal, as a Teaching Assistant, and he also worked as a Part-Time Lecturer for eight engineering colleges in Nepal. He worked in Nepal Telecom for more than four years as a Telecom Engineer in the field of information technology and telecommunication. He is the author of more than 70 technical papers in refereed international journals, scientific books, and conferences. He received an Indian Embassy Scholarship for his B.E. study, an Erasmus Mundus Scholarship for his M. Res. study, and an AFR Ph.D. grant from the National Research Fund (FNR) of Luxembourg. He received Best Paper Award in CROWNCOM 2015 conference, and for his Ph.D. thesis, he received "FNR award for outstanding PhD Thesis 2015" from FNR, Luxembourg. He is a member of IEEE and has been serving as a reviewer for several international journals and conferences; and also as a TPC member for a number of international conferences including IEEE ICC, IEEE PIMRC, IEEE Globecom, IEEE ISWCS and CROWNCOM.



Meryem Simsek, Tech. Univ. Dresden, Germany

Meryem Simsek received her Dipl.-Ing. degree in Electrical Engineering and Information Technology from University of Duisburg-Essen in Germany in 2008, holding a scholarship from the German National Academic Foundation which is granted to the outstanding 0.5% of all students in Germany. She obtained her Ph.D. degree on reinforcement learning based inter-cell interference coordination in heterogeneous networks from the same university in 2013. In 2013, she was

a post-doctoral visiting scientist at Florida International University. In 2014, she became a group leader at the Vodafone Chair Mobile Communication Systems at the Technical University Dresden, Germany. Dr. Simsek won the IEEE Communications Society Fred W. Ellersick Prize 2015. Since June 2015, she chairs the IEEE ComSoc Tactile Internet technical sub-committee and has initiated the IEEE P1918.1 working group and is serving as the secretary of the working group. In addition, she is leading the ETSI IP6 work item on IPv6 based Tactile Internet. She joined ICSI in October 2016. Her main research interests include fifth generation (5G) wireless systems, resource management in heterogeneous wireless networks, wireless network design and optimization, self-organizing networks, and the Tactile Internet and its applications.



Sameh Sorour, Univ. Idaho, USA

Sameh Sorour is an assistant professor in the area of computer, network and communication engineering. He received his bachelor's and master's degrees in electrical engineering from Alexandria University in 2002 and 2006, respectively. He then completed his doctorate in electrical and computer engineering from University of Toronto in 2011. After his doctorate, he worked as an industrial researcher at Siradel Canada based

on a MITACS industrial fellowship. He then worked for a year as a research fellow at King Abdullah University of Science and Technology (KAUST). In 2013, he joined King Fahd University of Petroleum and Minerals (KFUPM) as an assistant professor before moving to University of Idaho in 2016. Sameh is a senior member of the Institute of Electrical and Electronics Engineers (IEEE), with more than 50 publications in IEEE refereed journals and conferences. During his research career, he worked closely with several industrial and governmental institutions, such as LG Electronics Korea, the European Space Agency, the Canadian National Institute for the Blind (CNIB) and Siradel Canada. His research interests lie in the board disciplines of computer networking and communication engineering, with strong emphasis on the areas of network coding, device-to-device communications, internet of things (IoT) and its applications, cloud storage networks, femtocaching and fog networking, management of dense cellular networks and indoor positioning. He is also interested in using diverse mathematical tools (e.g. graph theory, stochastic modeling and optimization, game theory, machine learning, stochastic geometry, ... etc) in modeling, optimizing and smartening the operation of various engineering systems, such as transportation networks, power grids, charging of plug-in electric vehicles and e-health services.



Elvino Sousa, UofT, Canada

Elvino S. Sousa (S'79-M'80-SM'96-F'12) received the B.A.Sc. degree in engineering science and the M.A.Sc. degree in electrical engineering from the University of Toronto in 1980 and 1982, respectively, and the Ph.D. degree in electrical engineering from the University of Southern California in 1985. Since 1986, he has been with the Department of Electrical and Computer Engineering, University of Toronto, where he is currently a Professor and the Jeffrey Skoll Professor of Computer

Network Architecture. His current interests are in the areas of autonomous infrastructure wireless networks, cognitive radio, self configurable wireless networks, and two-tier networks. He pioneered the area of wireless communications with the University of Toronto. He is the Director of the Wireless Laboratory, which has undertaken research in wireless systems for the past 28 years. He is the Inventor of the autonomous infrastructure wireless network concept. He has been invited to give numerous lectures and short courses on spread spectrum, CDMA, and wireless systems in many countries. He has been a Consultant to Industry and governments internationally in the area of wireless systems. He has spent sabbatical leaves with Qualcomm and Sony CSL/ATL. He has also been involved in various standardization and industry related wireless activities and currently is actively participating in NGMN, as an Advisor. He received the Queen Elizabeth II Golden Jubilee Medal. He was a Chair of the IEEE Technical Committee on Personal Communications. He was the Technical Program Chair for PIMRC 95, the Vice-Technical Program Chair for Globecom 99, the Co-Technical Program Chair for WPMC 2010 and for PIMRC 2011, and he has been involved in the Technical Program Committee of numerous international conferences.



Michael Starsinic, InterDigital, USA

Michael Starsinic is a Principal Engineer in InterDigital's IoT Solutions Business Unit. For the past 7 years, his research interests have been centered on IoT related communication technologies. Since 2015, he has represented Convida Wireless in 3GPP's System Architecture Working Group 2 (SA2). While participating in 3GPP SA2, he has been active contributor on IoT related topics such as Service Capability Exposure, Non-IP Data Delivery, Power Saving Mode, Cellular IoT, etc.

Prior to his participation in 3GPP, he represented InterDigital in the Small Cell Forum's Network Architecture Group where he focused on Integrated Small Cell Wi-Fi Networks (ISWNs). Michael has been working on cellular communications technologies such as 3G FDD/TDD, LTE, and 5G since 2001. His experience spans multiple areas of the network and protocol stack including the physical layer, application layer, and mobile core network.



David Steer, Huawei Canada Research Centre, Canada

David Steer is a Staff Engineer at the Huawei Canada Research Centre in Kanata Ontario Canada. His current interests include the physics of mmWave channel modelling, spectrum management and radio technology for next generation mobile systems. David began his communications career in the days of cross-bar voice circuit switching at Bell-Northern Research in 1974. Since then the work has included communications security systems, personal radio communications, 3GPP/ETSI standards, spectrum management and latterly mmWave technology for mobile systems. In this process he became a named inventor for some 100 issued patents for communications. David has a PhD with a thesis topic in radio astronomy from the University of British Columbia (1984) and degrees in Physics/Electrical engineering from Queen's University Kingston Ontario (1972/1974). David is a Life Member of the IEEE.



Shaohui Sun, Datang Group, China

Dr. Shaohui Sun received his Ph.D. degree in Communication and Information Systems from Xidian University, Xi'an, China, in 2003. Presently he is the Chief Expert in the field of wireless communication of Datang Group, and CTO for Datang wireless mobile innovation center. Since March 2005, he has been deeply involved in the development and standardization of the Third-Generation Partnership Project Long-Term Evolution (3GPP LTE). He has published more than 60 peer-reviewed technical articles in international journals and conferences. His main research areas include multiple antenna technology, heterogeneous wireless networks, and TDD signal processing.



Tarik Taleb, Aalto Univ., Finland

Tarik Taleb received the B.E. degree in information engineering (with distinction) and the M.S. and Ph.D. degrees in computer sciences from Tohoku University, Sendai, Japan, in 2001, 2003, and 2005, respectively. From October 2005 to March 2006, he was a Research Fellow with the Intelligent Cosmos Research Institute, Sendai. He is currently an Assistant Professor with the Graduate School of Information Sciences, Tohoku University. His research interests lie in the field of wireless networking, satellite and space communications, congestion control protocols, mobility and handoff management, on-demand media transmission, and network security. Dr. Taleb is on the editorial board of the IEEE Transactions on Wireless Communications. He also serves as Vice Chair of the Satellite Communications Technical Committee of the IEEE Communications Society (ComSoc). He has been on the technical program committees of several different IEEE conferences, including Globecom, ICC, and WCNC, and he has chaired some of their sessions. He received the Funai Foundation Award in March 2007, the IEEE Computer Society Japan Chapter Young Author award in December 2006, the Niwa Yasujiro Memorial award in February 2005, and the Young Researcher's Encouragement Award from the Japan chapter of the IEEE Vehicular Technology Society (VTS) in October 2003.



Shilpa Talwar, Intel, USA

Shilpa Talwar is Director of Wireless Multicomm Systems and Senior Principle Architect in the Wireless Communications Laboratory at Intel, where she leads a research team focused on network architecture and technology innovations for 5G. Her research interests include heterogeneous networks, multi-radio interworking, full-duplex, mmWave communications, advanced MIMO, and interference mitigation techniques. While at Intel, she has contributed to IEEE and 3GPP standard bodies, including 802.16m and LTE-advanced. She is currently coordinating several university collaborations on 5G, and leads Intel Strategic Research Alliance (ISRA) on 5G. She is co-editor of a book on 5G "Towards 5G: Applications, Requirements and Candidate Technologies" published by Wiley in Jan 2017, co-chaired ICC 2014 workshop on "5G Technologies" and served as co-editor for a Special Issue on "The 5G Revolution" for IEEE Signal Processing Journal, November 2014. Prior to Intel, Shilpa held several senior technical positions in wireless industry working on a wide-range of projects, including algorithm design for 3G/4G & WLAN chips, satellite communications, GPS, and others.

Shilpa graduated from Stanford University in 1996 with a Ph.D. in Applied mathematics and an M.S. in electrical engineering. She is the author of 50+ technical publications and holds 33 patents (42 additional pending).



Serge Tatu, INRS, Canada

Serioja Ovidiu Tatu received the B.Sc. degree in radio engineering from Polytechnic University, Bucharest, Romania, in 1989, and the M.A.Sc. and Ph.D. degrees in electrical engineering from the École Polytechnique de Montréal, Montreal, QC, Canada, in 2001 and 2004, respectively. He was with the National Company of Telecommunications, Rom-Telecom, Bucharest, Romania, where he was an RF Engineer and the Head of the Telecommunications Laboratory from 1989 to 1993, and the Technical Manager from 1993 to 1997. He is currently an Associate Professor with the Institut National de Recherche Scientifique, Énergie Matériaux et Télécommunications, Montreal. His current research interests include the microwave/millimeter-wave circuit design, hardware and software radio receivers, radar, and imaging systems.



Reiner Thomä, Technische Universität Ilmenau, Germany

Reiner Thomä received the Dipl.-Ing. (M.S.E.E.), Dr.-Ing. (Ph.D.E.E.), and the Dr.-Ing. habil. degrees in electrical engineering and information technology from Technische Hochschule Ilmenau, Germany, in 1975, 1983, and 1989, respectively. From 1975 to 1988, he was a Research Associate in the fields of electronic circuits, measurement engineering, and digital signal processing at the same university. From 1988 to 1990, he was a Research Engineer at the Akademie der Wissenschaften der DDR (Zentrum für Wissenschaftlichen Gerätebau). During this period he was working in the field of radio surveillance. In 1991, he spent a sabbatical leave at the University of Erlangen-Nürnberg (Lehrstuhl für Nachrichtentechnik). Since 1992, he has been a Professor of electrical engineering (electronic measurement) at TU Ilmenau where he was the Director of the Institute of Communications and Measurement Engineering from 1999 until 2005. With his group, he has contributed to several European and German research projects and clusters such as RESCUE, WINNER, PULSERS, EUWB, NEWCOM, COST 273, 2100, IC 1004, COSR IRACON, EASY-A, EASY-C. He was the speaker of the German nation-wide DFG-focus project UKoLOS, Ultra-Wideband Radio Technologies for Communications, Localization and Sensor Applications (SPP 1202). He became an advisory board member of EU project mmMAGIC. His research interests include measurement and digital signal processing methods (correlation and spectral analysis, system identification, sensor arrays, compressive sensing, time-frequency and cyclostationary signal analysis), their application in mobile radio and radar systems (multidimensional channel sounding, propagation measurement and parameter estimation, MIMO-, mm-wave-, and ultra-wideband radar), measurement-based performance evaluation of MIMO transmission systems including over-the-air testing in virtual electromagnetic environments, passive coherent location, and UWB radar sensor systems for object detection, tracking and imaging. Prof. Thomä is a member of URSI (Comm. A), VDE/ITG. Since 1999 he has been serving as chair of the IEEE-IM TC-13 on Measurement in Wireless and Telecommunications. In 2007 he was awarded IEEE Fellow Member and received the Thuringian State Research Award for Applied Research both for contributions to high-resolution multidimensional channel sounding. In 2014 he received the Vodafone Innovation Award.



Antti Tölli, University of Oulu, Finland

Antti Tölli (M'08, SM'14) received the Dr.Sc. (Tech.) degree in electrical engineering from the University of Oulu, Oulu, Finland, in 2008. Before joining the Centre for Wireless Communications (CWC) at the University of Oulu, he worked for 5 years with Nokia Networks as a Research Engineer and Project Manager both in Finland and Spain. In May 2014, he was granted a ve year (2014-2019) Academy Research Fellow post by the Academy of Finland. He also holds an Adjunct Professor position with University of Oulu. During the academic year 2015-2016, he visited at EURECOM, Sophia Antipolis, France. He has authored more than 150 papers in peer-reviewed international journals and conferences and several patents all in the area of signal processing and wireless communications. His research interests include radio resource management and transceiver design for broadband wireless communications with a special emphasis on distributed interference management in heterogeneous

wireless networks. He is currently serving as an Associate Editor for IEEE Transactions on Signal Processing. Detailed list of publications is available at <http://www.cwc.oulu.fi/~atolli/Publications.pdf>.



Kamel Tourki, Huawei, France

Kamel Tourki (S'05-M'08-SM'13) was born in Antibes, France. He received the engineering degree in telecommunications in 2003 from the National School of Engineering, Tunis (Tunisia). He received his Master and PhD degrees from the University of Nice Sophia-Antipolis (France) in 2004 and 2008, respectively. He has been with Texas A&M University at Qatar (TAMUQ) from August 2008 through June 2014 as Senior Researcher. He joined Huawei France Research Center in December 2014

where he is currently Senior Research Engineer. His current research interests lie in the field of 4G/5G wireless communication systems, green cooperative and cognitive systems, PHY security and energy harvesting. Dr Tourki has published more than 60 Journal and conference papers, co-authored 2 patents (filed) on wireless energy transfer, and delivered a tutorial on self-sustainable 5G networks (EuCNC'15). Dr. Tourki currently serves as an Editor of the IEEE TRANSACTIONS ON COMMUNICATIONS and IEEE COMMUNICATIONS LETTERS, and he has been appointed as an Expert Scientist by the French National Agency of Research (ANR). He received twice the Research Fellow Excellence Award from TAMUQ (Apr. 2011 & Apr. 2014), Best poster award in IEEE DysPan 2012 Conference, the Outstanding Young Researcher Award from IEEE Communications Society for Europe - Middle East - Africa (EMEA) region in June 2013.



Chih-Cheng Tseng, National Ilan University, Taiwan

Chih-Cheng Tseng received his BS and MS degrees from the National Taiwan University of Science and Technology, Taiwan, and PhD degree from the Graduate Institute of Communications Engineering, National Taiwan University, Taiwan, in 1994, 1997, and 2007, respectively. He is currently an associate professor in the Department of Electrical Engineering, National Ilan University, Taiwan. He was an Exemplary Reviewer of the IEEE Communications Letters in 2010. He was a visiting

scholar at the Center for TeleInfrastruktur (CTIF), Aalborg University, Denmark in 2007. His research interests include the design and performance evaluation of protocols of the next generation mobile communications and wireless ad hoc/sensor networks. He was the recipients of the IEEE ICC 2010 and IEEE ISPA 2011 Best Paper Awards. He is a member of the IEEE.



Fredrik Tufvesson, Lund University, Sweden

Fredrik Tufvesson received his Ph.D. in 2000 from Lund University in Sweden. After two years at a startup company, he joined the department of Electrical and Information Technology at Lund University, where he is now professor of radio systems. His main research interests is the interplay between the radio channel and the rest of the communication system with various applications in 5G systems such as massive MIMO, mm wave communication, vehicular communication and radio

based positioning. Fredrik has authored around 65 journal papers and 130 conference papers, he is fellow of the IEEE and recently he got the Neal Shepherd Memorial Award for the best propagation paper in IEEE Transactions on Vehicular Technology.



Shahrokh Valaee, UofT, Canada

Shahrokh Valaee is with the Edward S. Rogers Sr. Department of Electrical and Computer Engineering, University of Toronto, where he is a Professor and the Associate Chair for Undergraduate Studies. He is the Founder and the Director of the Wireless and Internet Research Laboratory (WIRLab) at the University of Toronto. Professor Valaee was the TPC Co-Chair and the Local Organization Chair of the IEEE Personal Mobile Indoor Radio Communication (PIMRC) Symposium 2011. He

was a Track Co-Chair of WCNC 2014 and the TPC Co-Chair of ICT 2015. He has been the guest editor for various journals. From December 2010 to December 2012, he was the Associate Editor of the IEEE Signal Processing Letters, and an Editor of IEEE Transactions on Wireless Communications from 2010 to 2015. He is currently an Editor of Elsevier

Journal of Computer and System Science. Professor Valaee is a Fellow of the Engineering Institute of Canada.



Liesbet Van der Perre, KU Leuven, Belgium

Liesbet Van der Perre received the M.Sc. and PhD degree in Electrical Engineering from the KU Leuven, Belgium, in 1992 and 1997 respectively. Dr. Van der Perre joined imec's wireless group in 1997 in the wireless group and took up responsibilities as senior researcher, system architect, project leader and program director, until 2015. She was appointed full Professor in the DRAMCO lab of the Electrical Engineering Department of the KU Leuven and guest professor at the University of Lund in 1996. She's an author and co-author of over 300 scientific publications. Her main research interest is in energy efficient wireless communication and embedded systems.



Harish Viswanathan, Nokia Bell Labs, USA

Harish Viswanathan is Head of the Radio Systems Research Group. He leads an international team of researchers investigating various aspects of wireless communication systems, and in particular, 5G. In his prior role, as a CTO Partner he was responsible for advising the Corporate CTO on Technology Strategy through in-depth analysis of emerging technology and market needs. Harish Viswanathan joined Bell Labs in 1997 and has worked on multiple antenna technology for

cellular wireless networks, mobile network architecture, and M2M. He received the B. Tech. degree from the Department of Electrical Engineering, Indian Institute of Technology, Chennai, India and the M.S. and Ph.D. degrees from the School of Electrical Engineering, Cornell University, Ithaca, NY. He holds more than 50 patents and has published more than 100 papers. He is a Fellow of the IEEE and a Bell Labs Fellow.



Frederick W. Vook, Nokia Bell Labs, USA

Frederick W. Vook received the B.S. degree from Syracuse University in 1987 and the M.S. and Ph.D. degrees from The Ohio State University in 1989 and 1992, respectively, all in electrical engineering. From 1992 to 1995, he was with the Motorola Wireless Data Group where he worked on 19 GHz and 2.4 GHz propagation modeling and air-interface design for Motorola's wireless LAN products. From 1995 to 2008, he was with Motorola Laboratories, where he worked on MIMO, beamforming, and air interface design for broadband mobile communication systems. From 2008-2011, Dr. Vook was with Motorola Home & Networks Mobility where he worked on physical layer modeling and MIMO techniques for IEEE 802.16/WiMAX and LTE Rel-8-10. Since 2011, he has been with Nokia, Arlington Heights, IL, where his current work involves advanced antenna array solutions for LTE and 5G cellular systems.



Christopher Voss, CAE Healthcare, USA

Christopher Voss is an electronic design engineer at CAE Healthcare, a position he has occupied since 2013. Prior to joining CAE he developed medical devices at several startup companies dating back to 2007. He worked as a RF engineer at Qualcomm from 2003 to 2006. He received a M.S. in from Stanford University in 2002 and a B. Eng. from McGill University in 2000, both in the field of Electrical Engineering.



Xianbin Wang, Univ. Western Ontario, Canada

Xianbin Wang is a Full Professor and Canada Research Chair in Wireless Communications at The University of Western Ontario. His current research interests include adaptive wireless systems and networking, cooperative communications, wireless security, and integrated ICT systems. Prior to joining Western, Dr. Wang was a Senior Research Scientist/Research Scientist at Communications Research Centre Canada between July 2002 and December 2007. From December 2000

to July 2002, he was a system designer at STMicroelectronics (Ottawa Design Centre), where he was responsible for system design of DSL and Gigabit Ethernet chipsets. He was with Institute for Infocomm Research (I2R), Singapore (formerly known as Centre

for Wireless Communications), as a Senior R & D Engineer in 2000. Dr. Wang is also an Adjunct Professor at Laval University, QC, Canada. Dr. Wang has received a number of prestigious domestic and international awards and recognitions, including being named a Canada Research Chair, three IEEE Best Paper Awards, the President's Excellence Award and Technology Transfer Award from Communications Research Centre Canada, an Early Researcher Award from the Government of Ontario and the Public Service Award from the Canadian Federal Government. He is very actively involved in many international professional and standard development activities, which include his current role as Chair of the IEEE Interest Group on Wireless Technology for Multimedia Communications. He is a Senior Member of IEEE and currently serves as an Associate Editor for IEEE Wireless Communications Letters, IEEE Transactions on Broadcasting and IEEE Transactions on Vehicular Technology. Dr. Wang was involved in a number of IEEE conferences including ICC, GLOBECOM, WCNC, VTC, and ICME, on different roles such as technical program co-chair, symposium chair, track chair, tutorial instructor TPC and session chair. Dr. Wang was nominated as an IEEE Distinguished Lecturer in August 2009.



Yingmin Wang, Datang Group, China

Yingmin Wang received his Ph.D. degree in Signal and Information System from Xidian University, Xi'an, China. He is currently the Chief Technical Officer and Chief Scientist in Datang Telecom Technology & Industry Group. He is also General Manager of DTInno. His current research interests include 4G & 5G key technology, design and development of wireless tools for telecommunication product etc. He has applied more than 350 patents, and published more than 40 papers.



Xiaojie Wang, Beijing University, China

Xiaojie Wang received his Ph.D. degree from Beihang University in 1996. He is a professor and director of the Centre for Intelligence Science and Technology at Beijing University of Posts and Telecommunications. His research interests include Natural Language Processing and multi-modal cognitive computing. He is an executive member of the council of Chinese Association of Artificial Intelligence, director of natural language processing committee. He is a member of council of Chinese Information Processing Society and member of Chinese Processing Committee of China Computer Federation. He has published more than 100 papers including an ACM Multimedia best paper award finalist.



Yi Wang, Huawei Technologies Co., Ltd, China

Yi Wang [SM'11] is currently a principal engineer at Huawei Technologies Co., Ltd. in Shanghai. He received the M.S.E.E and Ph.D degrees in information engineering department from Beijing University of Posts & Telecommunications, China, in 1997 and 2000 respectively. He has worked at Tsinghua University and the University of Kiel in Germany as post-doctor. Since 2005 he joined Huawei Technologies Co., Ltd. He led a series of research projects including beyond 3G, superposition

coding for LTE-advanced system, distributed antenna system, cloud RAN, massive MIMO and 5G mmWave communications. Currently he is leading 5G multi-band communications research. Dr. Yi Wang owns 60+ patents and 70+ publications. Many patents have been realized in LTE product or used in 3GPP and IEEE802.11 standards. He has been involved in as series of research organizations including Moible VCE, WWRF, 3GPP, IEEE802, and IEEE conferences.



Joerg Widmer, Institute IMDEA Network, Spain

Joerg Widmer is Research Professor at Institute IMDEA Networks in Madrid, Spain. He received his M.S. and PhD degrees in computer science from the University of Mannheim, Germany in 2000 and 2003, respectively. His research focuses primarily on wireless networks, ranging from extremely high frequency millimeter-wave communication and MAC layer design to mobile network architectures. From 2005 to 2010, he was manager of the Ubiquitous Networking Research Group at

DOCOMO Euro-Labs in Munich, Germany, leading several projects in the area of mobile and cellular networks. Before, he worked as post-doctoral researcher at EPFL, Switzer-

land on ultra-wide band communication and network coding. He was a visiting researcher at the International Computer Science Institute in Berkeley, CA, USA and University College London, UK. Joerg Widmer authored more than 100 conference and journal papers and three IETF RFCs, holds 13 patents, serves on the editorial board of IEEE Transactions on Communications, and regularly participates in program committees of several major conferences. Recently he was awarded an ERC consolidator grant as well as a Spanish Ramon y Cajal grant. He is senior member of IEEE and ACM.



Stan Wong, Digital Catapult, UK

Stan Wong is a 5G Testbed Manager from Digital Catapult. He was IT consultant in South East Asia and responsible to all the operations support system, big data products and metro ethernet deployment. He is one of the winner of European Commission Collaborative Spectrum Sharing Prize. He is the leader of Horizon 2020 research and innovation programme 5G novel radio multiservice adaptive network architecture (5G NORMA) security. He also was the leading editor of the chapter on "5G

Infrastructure Public Private Partnership (5G-PPP) security work group trust model". He has been invited to give a number of the information and communications technology (ICT) security talks including a talk to the Things Connected Project funded by Future Cities Catapult in the UK. This project aims to encourage the UK Internet of Things (IoT) small and medium-sized enterprises (SMEs) to develop secure IoT applications. He gave a talk on 5G security to International Telecommunications Union (ITU) in September 2017.



Huan Wu, Huawei Canada Research Center, Canada

Huan Wu is a Senior Engineer at Huawei Canada Research Center, Ottawa. He received his Ph.D. degree in electrical engineering from Xidian University, China. Before joining Huawei, he worked for Research in Motion, which is now known as the Blackberry. His current interest is in the areas of research and development of radio access technologies for wireless networks. He has over 20 patents granted in the US and globally.



Yang Yang, SIMIT and WiCO, China

Yang Yang is currently a professor with Shanghai Institute of Microsystem and Information Technology (SIMIT), Chinese Academy of Sciences, serving as the Director of CAS Key Laboratory of Wireless Sensor Network and Communication, and the Director of Shanghai Research Center for Wireless Communications (WiCO). He is also a Distinguished Adjunct Professor with the School of Information Science and Technology, ShanghaiTech University. Prior to that, he has held faculty

positions at The Chinese University of Hong Kong, Brunel University, and University College London (UCL). Yang is a member of the Chief Technical Committee of the National Science and Technology Major Project "New Generation Mobile Wireless Broadband Communication Networks" (2008-2020), which is funded by the Ministry of Industry and Information Technology (MIIT) of China. In addition, he is on the Chief Technical Committee for the National 863 Hi-Tech R&D Program "5G System R&D Major Projects", which is funded by the Ministry of Science and Technology (MOST) of China. Since January 2017, he has been serving the OpenFog Consortium as the Director for Greater China Region. Yang's current research interests include wireless sensor networks, Internet of Things, Fog computing, Open 5G, and advanced wireless testbeds. He has published more than 150 papers and filed over 80 technical patents in wireless communications.



Jin Yang, Verizon, USA

Jin Yang is a Fellow at Verizon Communications, responsible for wireless technology and strategy. She is leading next generation wireless network architecture and technologies, including 5G access technologies, LTE-Advanced, Machine Type Communications, Self-Organizing Network and Heterogeneous Network. She has played a key role in development and commercialization of LTE network in 2010, Verizon's choice of LTE as 4G technology in 2007, various CDMA network devel-

opments since 1995 at Verizon, Vodafone and AirTouch Communications. Dr. Jin Yang has contributed to establish US IS-95 CDMA, IS-2000 EV-DO, and 3GPP LTE and ongoing 5G standardizations.



Wei Yu, UoF/T, Canada

Wei Yu received the B.A.Sc. degree in computer engineering and mathematics from the University of Waterloo, Waterloo, ON, Canada, in 1997, and the M.S. and Ph.D. degrees in electrical engineering from Stanford University, Stanford, CA, USA, in 1998 and 2002, respectively. Since 2002, he has been with the Electrical and Computer Engineering Department, University of Toronto, Toronto, ON, Canada, where he is currently a Professor and holds a Canada Research Chair (Tier 1) in Information Theory and Wireless Communications. His main research interests include information theory, optimization, wireless communications, and broadband access networks. Prof. Yu serves on the IEEE Information Theory Society Board of Governors (2015–17). He is an IEEE Communications Society Distinguished Lecturer (2015–16). He served as an Associate Editor of the IEEE Transactions on Information Theory (2010–2013), an Editor of the IEEE Transactions on Communications (2009–2011) and the IEEE Transactions on Wireless Communications (2004–2007), and a Guest Editor for a number of special issues of the IEEE Journal on Selected Areas in Communications and the EURASIP Journal on Applied Signal Processing. He was a Technical Program Co-Chair of the IEEE Communication Theory Workshop in 2014, and a Technical Program Committee Co-Chair of the Communication Theory Symposium at the IEEE International Conference on Communications (ICC) in 2012. He was a member of the Signal Processing for Communications and Networking Technical Committee of the IEEE Signal Processing Society (2008–2013). He is recognized as a Highly Cited Researcher by Thomson Reuters. He received a Steacie Memorial Fellowship in 2015, an IEEE Communications Society Best Tutorial Paper Award in 2015, an IEEE ICC Best Paper Award in 2013, an IEEE Signal Processing Society Best Paper Award in 2008, the McCharles Prize for Early Career Research Distinction in 2008, the Early Career Teaching Award from the Faculty of Applied Science and Engineering, University of Toronto, in 2007, and an Early Researcher Award from Ontario in 2006.



Faqir Zarrar Yousaf, NEC Laboratories Europe, Germany

Faqir Zarrar Yousaf is a Senior Researcher at NEC Laboratories Europe in Heidelberg, Germany. His current research interest is focused around NFV/SDN related technologies in the context of 5G network architecture and operations. He is also an active delegate at the ETSI NFV standards organization. He was awarded NEC's standardization "Fresh Player" award in 2015 for outstanding work in ETSI NFV. He has contributed to around 7 published ETSI NFV standard documents with over 130 contributions; while being a Rapporteur for three work items. Dr. Yousaf has extensive experience in the design development, modeling, simulation and prototyping of novel protocols, algorithms and system methods for optimizing network performance. He has filed 11 patents while his research work has been published in several peer reviewed international journals, conferences, book chapters and Internet Drafts. He is member of the Institute of Electrical and Electronics Engineers (IEEE) and has served as Co-chair, TPC member and reviewer for various conferences and journals.



Haijun Zhang, University of Science and Technology, China

Haijun Zhang (M'13, SM'17) is currently a Full Professor in University of Science and Technology Beijing, China. He was a Postdoctoral Research Fellow in Department of Electrical and Computer Engineering, the University of British Columbia (UBC), Vancouver Campus, Canada. Dr. Zhang has published more than 80 papers and authored 2 books. He serves as Editor of IEEE 5G Tech Focus, Journal of Network and Computer Applications, Wireless Networks, Telecommunication Systems, and KSII Transactions on Internet and Information Systems, and serves/served as a leading Guest Editor for IEEE Communications Magazine, IEEE Transactions on Emerging Topics in Computing and ACM/Springer Mobile Networks & Applications. He serves/served as General Co-Chair of 5GWN'17 and GameNets'16, Track Chair of ScalCom2015, Symposium Chair of the GameNets'14, and Co-Chair of Workshop on 5G Ultra Dense Networks in ICC 2017, Co-Chair of Workshop on 5G Ultra Dense Networks in Globecom 2017, and Co-Chair of Workshop on LTE-U in Globecom 2017. Prof. Zhang received the Young Elite Scientist Sponsorship Program by CAST in 2016 and received the IEEE Com-Soc Young Author Best Paper Award in 2017. His current research interests include 5G, Ultra-Dense Networks, Small Cells, LTE-U and Network Slicing.



Yifeng Zhou, Communications Research Centre, Canada

Yifeng Zhou received his PhD degree in electrical engineering, in 1995, from McMaster University, Hamilton, Ontario, Canada. Currently, Dr. Zhou is a senior research scientist at the Communications Research Centre (CRC) Canada. Before that, he was a defence scientist with the Radar Electronic Warfare Section at Defence R&D Canada (DRDC). Dr. Zhou's research interests are in the areas of statistical signal processing, data fusion and mobile ad hoc networking. He publishes actively in these areas. Currently, at CRC, Dr. Zhou leads a number of projects on networked autonomous unmanned aerial vehicle (UAV) applications. He has served on the organizing committees of a number of international conferences in recent years.



Sheng Zhou, Tsinghua Univ., China

Sheng Zhou received his B.E. and Ph.D. degrees in Electronic Engineering from Tsinghua University, Beijing, China, in 2005 and 2011, respectively. He is now an associate professor in Electronic Engineering Department at Tsinghua University, Beijing, China. From January to June 2010, he was a visiting student at Wireless System Lab, Electrical Engineering Department of Stanford University. He is a co-recipient of the Best Paper Award from the Asia-Pacific Conference on Communication (APCC) in 2009 and 2013, the 23th IEEE International Conference on Communication Technology (ICCT) in 2011, and the 25th Intl. Tele-traffic Cong. (ITC) in 2013. His research interests include cross-layer design for multiple antenna systems, cooperative transmission in cellular systems, and green wireless communications. Dr. Zhou served as the publicity chair of the first IEEE International Conference on Communications in China (ICCC'12), the technology program committee (TPC) member of SmartGridComm'12, WCNC'13, Globecom'13, and ICC'14. He also serves as the guest editor of the China Communications special issue on "Energy Conservation and Harvesting for Green Communications".



Peiying Zhu, Huawei, 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 is currently serving as a guest editor for the SPM Special Issue on Signal Processing for the 5G Revolution. 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.



UNIVERSITÉ DE RECHERCHE
A RESEARCH UNIVERSITY

A PILLAR FOR RESEARCH AND TRAINING

Taking a multidisciplinary approach to fundamental and applied research, INRS research teams play a critical role in the advancement of science both in Canada and around the world as well as in the training of highly qualified researchers.

With its ever-growing number of strategic partnerships and state-of-the-art research facilities, INRS is at the forefront as it leverages a distinctive global framework to tackle today's challenges.

INRS, A UNIQUE WORLD-CLASS UNIVERSITY FOR QUEBEC, DEDICATED TO GRADUATE AND POSTGRADUATE RESEARCH AND TRAINING.



INRS.CA

AUTHORS INDEX

A

Antony Franklin A
Antonio A.F. Loureiro
Parham Aarabi
Luis F. Abanto-Leon
Rana Abbas
Naveed Abbasi
Mohamed Abdallah
Mohammad Abdel-Rahman
Ahmed Abdelgawwad
Fatma Abdelkefi
Mai Abdelmalek
Yassine Abdulsalam
Ahmed Abotabl
Sergio Abreu
Najah Abu Ali
Islam Abu Mahady
Ibrahim Abualhaol
Affoua Thérèse Aby
Fumiyuki Adachi
Bamidele Adebisi
Mary Adedoyin
Abdulkareem Adinoyi
Cedric Adjih
Ali Afana
Sofiene Affes
Saeed Afrasiabi-Gorgani
Nima Afraz
Amir Hosein Afshar Sedigh
Anjali Agarwal
Hamid Aghvami
Leonardo Aguayo
Ramon Agustí
Roger Ahiadormey
M. Omair Ahmad
Nazli Ahmad Khan Beigi
Hamed Ahmadi
Furqan Ahmed
Mohamed Hossam Ahmed
Jaehyun Ahn
Bo Ai
Sonia Aïssa
Wessam Ajib
Yuta Akai
Ozgur Akan
Salam Akoum
Ismet Aktas
Ian Akyildiz
Ismaeel Al Ridhawi
Naofal Al-Dhahir
Arafat Al-Dweik
Ala Al-Fuqaha
Mazin Al-Shalash
Ismael Al-Shiab
Ahmed Al-Tahmeesschi
Abdulrahman Alabbasi
Shafiq Alam
Mehdi Alasti
Seyedeh Faezeh Alavi
Ozgu Alay
Abdurhman Albasir
Jose Alcaraz-Calero
Adel Aldalbahi

Michael Alexander Riegler
Stefan Alfredsson
Amal Algedir
Mohammad Alhassoun
Ammar Alhosainy
Faiza Ali
Zoraze Ali
Khurram Alimgeer
Noura Algeri
Elias Allayiotis
Amira Alloum
Abdullah Almasoud
Celso Almeida
Erika Almeida
Mohammed Almekhlafi
Mario Alonzo
Moayad Aloqaily
Mohamed-Slim Alouini
Ismail AlQerm
Rayan Alsisi
Ahmed Alsoshaily
Carlos Altamirano
Mustapha Amara
Francesco Amato
Osama Amin
Fatemeh Amirnavaei
Mohamed Lassaad Ammari
Raphael Amorim
Wei An
Stefano Andrenacci
Jennifer Andreoli-Fang
Jeffrey Andrews
Guillaume Andrieux
Sanya Anees
Vangelis Angelakis
Sakly Anis
Waqas Anjum
Ramesh Annavaajala
Prince Anokye
Imran Ansari
Junaid Ansari
Bogdan Antonescu
Josephina Antoniou
Nur Ilyana Anwar Apandi
Tsuguhide Aoki
Rikke Apelfröjd
John Apostolopoulos
Reza Arablouei
Christian Arendt
Christian Arendt
Mohamed Amine Arfaoui
Antonios Argyriou
Simon Armour
Siham Arreffag
Huseyin Arslan
Chinmayananda Arunachala
Sultangali Arzykulov
Gerd Ascheid
Ahmad Asghar
Talha Asghar
Hiroshi Ashida
Shehzad Ashraf
Chadi Assi

Kalle Åström
Hussien Attia
Ioannis Avgouleas
Beshah Ayalew
Nachiket Ayir
Seyedarvin Ayoughi
Mahdi Azari
Mourad Azzakhmam
Leila Azzouz Saidane

B

Samudhyatha B
Ayda Babaei
Osamah Badarneh
Ashraf Badawi
Kareem Baddour
Faouzi Bader
Jaeuk Baek
Jung-Yeon Baek
SeungKwon Baek
Ali Baghaki
Jingwen Bai
Mahdi Baianifar
Wafae Bakkali
Krzysztof Bakowski
Saygin Baksi
Eren Balevi
Nicholas Bambos
Fatemeh Banaie
Dmitry Bankov
Gaurav Bansal
Zhang Baofeng
Martina Barbi
Joseph Barfett
Pradip Barik
Sergio Barrachina-Muñoz
Thomas Barratt
Hamid Reza Barzegar
C. Umit Bas
Stefano Basagni
Yaser Baseri
Otman Basir
Francesca Bassi
Ejder Bastug
Naïm Batani
Kenneth Batstone
Ali Bayat
Suzan Bayhan
Alessandro Bazzi
Wassima Bchimi
Mark Beach
Zdenek Becvar
Ebrahim Bedeer
A. A. (Louis) Beex
Dario Bega
Sipra Behera
Ioannis-Prodomos Belikaidis
Boris Bellalta
Faouzi Bellili
Souheib Ben Amor
laad Ben Dhia
Kais Ben Fredj
Larbi Ben Hadj Slama

Sana Ben Jemaa
Oussama Ben Smida
Khiredine Benaissa
Anass Benjebbour
Jihen Bennaceur
Mark Bentum
Olivier Berder
Luca Bergesio
Neil Bergmann
Andreas Bergström
Loic Bernard
Ana Bernardos
Carlos Bernardos
Randall Berry
Nidhi Bhargav
Kriti Bhargava
Sandeep Bhat
Manav Bhatnagar
Farrukh Bhatti
Amhmed Bhiih
Akram Bin Sediq
Pascal Bisson
Subir Biswas
Salim Bitam
Naim Bitar
Joachim Björsell
Thomas Blazek
Jiri Blumenstein
Miljko Bobrek
Holger Boche
Stefan Böcker
Hervé Boeglen
Vivek Bohara
Biljana Bojovic
Amnart Boonkajay
Guillem Boquet
Irem Bor-Yaliniz
Viviane Borges
Alireza Borhani
Ranjan Bose
Elias Bou-Harb
Ammar Bouallegue
Ridha Bouallegue
Ridha Bouallegue
Marie-Laure Boucheret
Daniel Boudreau
Gary Boudreau
Asma Bouhrel
Mustapha Bouhtou
Azzedine Boukerche
Lila Boukhatem
Sandrine Boumard
Didier Bourse
Emmanuel Boutillon
Christopher Boyd
Adoniran Braga
Michael Bredel
Pierre Bretillon
Pierre Brouillette
Tyler Brown
Anna Brunstrom
Saket Buch
Rohit Budhiraja

Nicola Bui
Berna Bulut
Daoud Burghal
Simon Burkert
Alister Burr
Marian Buschsieweke
Naveed Butt
Saliha Büyükcöçak
Stefano Buzzi

C

Adnane Cabani
Danijela Cabric
Luísa Caeiro
Yunlong Cai
George Caldwell
Doru Calin
Daniel Camps-Mur
Berk Canberk
Jean Pierre Cances
Cristina Cano
Aijun Cao
Jiuyue Cao
Jue Cao
Barry Cardiff
Onur Carhacioglu
Jose Casar
Nicolas Cassiau
Cicek Cavdar
Giammarco Cecchini
Marco Centenaro
Sinasi Cetinkaya
Tijani Chahed
Pascal Chahine
Kok Keong Chai
Cirine Chaieb
Saswat Chakrabarti
Pratik Chakraborty
Baptiste Chamailard
Benoit Champagne
Bruno Chang
Chengpeng Chang
Ronald Chang
Wei Chang
Chi-chao Chao
Hsi-Lu Chao
Hua Chao
John Chapman
Jawwad Chattha
Symeon Chatzinotas
Ali Chehab
Binqiang Chen
Chen Chen
Daimeng Chen
Daixin Chen
Guangjin Chen
Hao Chen
Hongji Chen
Hua Chen
Jiayi Chen
Runhua Chen
Tao Chen
Wei Chen

Xin Chen
Yajun Chen
Yin-Yi Chen
Ying Chen
Yu Chen
Yu-Han Chen
Yu-Jia Chen
Yue Chen
Yun-Chun Chen
Yuyang Chen
Zhihang Chen
Zhuo Chen
Li-Yu Cheng
Peng Cheng
Qian Cheng
Roger Cheng
Shin-Ming Cheng
Mohamed Cheriet
Nesrine Cherif
Sofiane Cherif
Soumaya Cherkaoui
Romain Chevillon
Mucong Chi
Chiu-Ti Chiang
Roman Chirikov
Alessandro Chimento
Dong-Ho Cho
Seungkwon Cho
A. Chockalingam
Sooyong Choi
Yang-Seok Choi
Peter Han Joo Chong
Kaushik Chowdhury
Mainak Chowdhury
Ping Chu
Gang Chuai
Young Jin Chun
Fernando Chitrón
Victor Cionca
Ali Cirik
Tim Clarke
Franklin Cochachin Henostroza
Tezcan Cogalan
Errol Colak
Vania Conan
Filipe Conceição
Jean-Marc Conrat
Juan Antonio Cordero
Mario Cordina
Alejandro Correa
Luis Correia
Xavier Costa-Perez
Laura Cottatellucci
Simon Cotton
Marceau Coupechoux
Jean-Christophe Cousin
Rodolfo Coutinho
Paul Crane
Jorge Crichigno
Pieter Crombez
Matthieu Crussière
Qimei Cui
Kanapathippillai Cumanan

D

Claude D'Amours

Daniel Benevides da Costa
Mohamed-Yahia Dabbagh
Wiem Dahech
Tony Daher
Jianmei Dai
Jincheng Dai
Atoosa Dalili Shoaie
Oussama Damen
Ghina Dandachi
Kapil Dandekar
Thomas Dandres
Peter Danielsen
Stefano Dantas
Parija Darian
Izzat Darwazah
Prajna Dash
Raja Datta
Kemal Davaslioglu
Joao Victor de Carvalho Evangelista
Fabian de Ponte Müller
Rausley de Souza
Thomas Dean
Mérouane Debbah
Carl Debono
David Declercq
Laurent Decreusefond
Luis Del Carpio
Natalia Dementieva
Panagiotis Demestichas
Ali Demir
Jeremiah Deng
Junquan Deng
Tayeb A. Denidni
Juwendo Denis
Mahsa Derakhshani
Margot Deruyck
Charles Despins
Piergiuseppe Di Marco
Rocco Di Taranto
Cheikh Diakhate
Ugo Dias
Andre Didenko
William Diego
Maria Dimakopoulou
Zhiguo Ding
Paolo Dini
Bakarime Diomande
Jean Francois Diouris
Sayed Hossein Dokhanchi
Mark Doll
Chao Dong
Dan Dong
Lijun Dong
Min Dong
Weiwei Dong
Vaggelis Douras
Tim Dowdell
Alexis Dowhuszko
Linda Doyle
Linsong Du
Liutong Du
Mingde Du
Xiaoyu Duan
Gleb Dubosarskii
Torsten Dudda
Pierre Duhamel

Tolga Duman
Gregor Dumphart
Juan Duncan
Gregory Durgin
Salman Durrani
Eryk Dutkiewicz
Armen Dzhagaryan

E

Ehsan Ebrahimi Khaleghi
Naoto Egashira
Ahmad El Assaf
Inès El Korbi
Rachid El-Azouzi
Amr El-Keyi
Hany El-Sayed
Amr El-Sherif
Salah Eddine Elayoubi
Tamer ElBatt
Belal Eldiwan
Robert Elliott
Amr Elrasad
Mahmoud Elsaadany
Maha Elsabrouty
Taoufik En-Najjary
Yuka Enjoji
Onye Erim
Salim Eryigit
Khaled Eshteiwi
Chaker Essid
Tahar Ezzedine

F

Yasmine Fahmy
Olabisi Falowo
Pape Fam
Gengfa Fang
Zequan Fang
Syed Faraz Hasan
Carlos Faria da Rocha
Soodeh Farokhi
Hasan Farooq
Muhammad Omer Farooq
Tom Farrell
Ziad Fawal
Awatef Feidi
Afef Feki
Benevid Felix
Chunyan Feng
Jianyuan Feng
Mingjie Feng
Yunqi Feng
Zhiyong Feng
Xavier Fernando
Ramon Ferrús
Peter Fertl
Gerhard Fettweis
Hayfa Fhima
Mark Flanagan
Bernard Fleury
Jose Flordelis
Amir. H. Forghani
Sebt Foufou
Pasqualina Fragneto
Norman Franchi
Colin Frank

Ragnar Freij-Hollanti
Guy Fremont
Jean-François Frigon
Carsten Fritsche
Takeo Fujii
Shunsuke Fujio
Hiroshi Fujita
Hayato Fukuzono
Carrson Fung
Andrea Fusiello

G

Francois Gagnon
Mario Galluscio
Samantha Gamboa
Chai-Hien Gan
Ghurumuruhan Ganesan
Qiubin Gao
Shuai Gao
Wanxin Gao
Johan Garcia
Ana Garcia Armada
Parul Garg
Azeddine Gati
Sumit Gautam
Yinghao Ge
Benoit Geller
Andreas Georgakopoulos
Jithin George
Yacine Ghamri-Doudane
Nasir Ghani
Takoua Ghariani
Amir Ghasemi
Zabih Ghassemloooy
Hakim Ghazzai
Arunabha Ghosh
Joydev Ghosh
Ali Ghrayeb
Mikael Gidlund
Richard Gitlin
Lorenza Giupponi
Fabio Giust
Nishith Goel
Andrea Goldsmith
Nada Golmie
Siyuan Gong
Wei Gong
Leonardo Goratti
Tomas Gotthans
Reinhard Gotzhein
Ala Gouisse
Sanjay Goyal
David Grace
Annie Gravey
Bruce Gray
Michael Grieger
David Griffith
James Griffiths
Ole Grøndalen
Fuqiang Gu
Liang Gu
Xinyu Gu
Mohamed Guadane
Jianfeng Guan
Xiang Gui
Fabrice Guillemin

Omer Gul
Yunus Can Gultekin
Mesut Günes
Fredrik Gunnarsson
Caili Guo
Fengxian Guo
Hao Guo
Jing Guo
Kaiyang Guo
Rongbin Guo
Shengjie Guo
Tao Guo
Zhigang Guo
Akash Gupta
Himank Gupta
Rahul Gupta
Gurkan Gur
M. Cenk Gursoy
Andrei Gurtov
Sanjeev Gurugopinath
Carl Gustafson
Fredrik Gustafsson
Carlos Gutiérrez
Can Guven
Ismail Güvenç

H

Farzad H. Panahi
Fereidoun H. Panahi
Thang Ha
Vu Ha
Harald Haas
Zygmunt Haas
Oussama Habachi
Majed Haddad
Abdelhakim Hafid
Haithem Haggui
Ali Haghighi
Faezeh Hajiaghajani
Mouna Hajir
Moufida Hajjaj
Matti Hämäläinen
Jehad Hamamreh
Mounia Hamidouche
Ridha Hamila
Karim Hammad
Wala Hamouda
Dong Han
Hyungsik Han
Sang Ik Han
Shengqian Han
Youngnam Han
Yuchao Han
Zhu Han
Chaouki HANNACHI
Li Hao
Peng Hao
Atsushi Harada
Hiroshi Harada
Wibowo Hardjawana
Ilkka Harjula
Dale Harman
Janelle Harms
George Harris
P. Sai Shri Harsha
Shahriar Hasan

Umair Hashmi
Mazen Hasna
Salem Hasnaoui
Syed Ali Hassan
Yahia Hassan
Ghaith Hattab
Chang He
K. HE
Ruisi He
Ying He
Robert Heath
Mark Hedley
Sonia Heemstra de Groot
Michael Heimlich
Jean-François Héland
Ariel Heller
Gustaf Hendeby
Makoto Higaki
Ahmed Hindy
Ivan Wang-Hei Ho
Klaus Hoffmann
Samira Homayouni
Atsushi Honda
Hirotada Honda
Daesik Hong
Een-Kee Hong
Sungnam Hong
Michael Honig
Naoki Honma
Kari Horneman
Md Hosen
Ashraf Hossain
Tom Hößler
Xiaolin Hou
Xinjing Hou
Chafouk Houcine
Hung-Yun Hsieh
Fei Hu
Honglin Hu
Nan Hu
Sha Hu
Shaoxiong Hu
Yihong Hu
Yulin Hu
Changcheng Huang
Chih-Wei Huang
Chuan Huang
Jinyi Huang
Kaizhi Huang
Pei Huang
Teng-Wei Huang
Yongliang Huang
Yongming Huang
Yuzhen Huang
Zhiyi Huang
Eddy Hum
Chi-Hsiang Hung

Mohamed Ibnkahla
Ahmed Ibrahim
Ahmed Ibrahim
Hanan Idoudi
Jari Iinatti
Ayesha Ijaz
Bilal Ijaz

Muhammad Ijaz
Salama Ikki
Muhamamd Ikram
Jacek Ilow
Tetsuro Imai
Ali Imran
Muhammad Ali Imran
Kei Inage
Minoru Inomata
Shohei Ishikawa
Mohamed Sufyan Islam
Omneya Issa
Shoji Itoh
Stepan Ivanov
Motoki Iwata

J
Bijan Jabbari
Swaroop Jacob
Thomas Jacobsen
Mohammad Jafari
Seyyed Mahmood Jafari Sadeghi
Hamid Jafarkhani
Deepa Jagyasi
José Jaime-Rodríguez
Leila Jalili
Muhammad Nasar Jamal
Behnam Jamali
Sobia Jangsher
Hazim Jarrah
Abdallah Jarwan
Mohammed Jasim
Mohammad Reza Javan
Dushantha Nalin K. Jayakody
Beeshanga Abewardana Jayaw-

ickrama
Hong Ji
Lei Ji
Xinsheng Ji
Huiling Jiang
Min Jiang
Tao Jiang
Ting Jiang
Wei Jiang
Xiaoming Jiang
Yuming Jiang
Jian Jiao
Jofina Jijin
Jaime Jiménez
Shi Jin
Xueguang Jin
Abhishek Jindal
Meifang Jing
Ammar Jlassi
Princy Johnson
Anders Jonsson
Pascal Jörke
Eduard Jorswieck
Wout Joseph
Badii Jouaber
Insik Jung
Soojung Jung
Markku Juntti
Raja Jurdak

K
Ramesha C K
Saraswathi K
Georges Kaddoum
Toshinori Kagawa
Jaber Kakar
Elham Kalantari
Jarkko Kaleva
Ahmed Kamal
Mahmoud Kamel
Nagarajan Kandasamy
Nahi Kandil
Megumi Kaneko
Kota Kanemura
Joonhyuk Kang
Burak Kantarci
Shipra Kapoor
Gunes Karabulut Kurt
Nujoom Sageer Karat
Mohsen Karimzadeh Kiskani
Jyotirmoy Karjee
Heikki Karvonen
Kanshiro Kashiki
Andreas Kasprzak
Roland Katona
Atsuto Kawagoe
Toshio Kawasaki
Djamel Eddine Kebiche
Jean-Marc Kelif
Wolfgang Kellerer
Lounis Kessal
Younes Khadraoui
Mohamed Khairy
Nabil Khalid
Mohamed Khalil
Muhammad Saeed Khan
Shah Nawaz Khan
Tamer Khattab
Soheil Khavari
Fahime Khoramnejad
Evgeny Khorov
Kourosh Khoshelham
Mohammad Ghadir Khoshkholgh
Dashtaki
Hossein Khoshnevis
Lyes Khoukhi
Abdallah Khreishah
Mohamed Achraf Khsiba
Michel Kieffer
Kai Kientopf
Wolfgang Kiess
Stephen Killough
Bong Ho Kim
Hyejin Kim
Hyunsoo Kim
Keunyoung Kim
Minho Kim
Seong-Lyun Kim
Taeyoung Kim
Won-Ik Kim
Dai Kimura
Ryota Kimura
Shigekazu Kimura
Tatsuaki Kimura
Yoshihisa Kishiyama

Ahmed Kishk
Rajalekshmi Kishore
Naoki Kita
Koshiro Kitao
Seung-Woo Ko
Makoto Kobayashi
Yosuke Kodama
Ryuji Kohno
Chikara Kojima
Fumihide Kojima
Di Kong
Arie Koppelaar
Manel Kortas
Alper Kose
Selçuk Köse
Yehia Kotb
Konstantinos Kousias
István Kovács
Christopher Kramer
Harris Kremo
Jevgenij Krivochiza
Brian Krongold
Pawel Kryszkiewicz
Witold Krzymien
Martin Kuerbis
Michel Kulhandjian
Tomoaki Kumagai
Arun Kumar
Vaibhav Kumar
Vikram Kumar
Abhaykumar Kumbhar
Timo Kumpuniemi
Thomas Kunz
Ping-Heng Kuo
Aleksy Kureev
Hirotaki Kuriki
Daisuke Kurita
Teja Kuruganti
Naoki Kusashima
Branislav Kusy
Jeongho Kwak
Sungoh Kwon

L
Isabelle Labbe
Houda Labiod
Alexandros Ladas
Xavier Lagrange
Eva Lagunas
Samer Lahoud
Massinissa Lalam
Alexander Lampe
Lutz Lampe
Rami Langar
Wouter Lanneer
Simon Lansing
Anna Larmo
Poul Larsen
Matti Latva-aho
Buon Kiong Lau
Chad Lau
Chun Pong Lau
Mads Lauridsen
Damien Lavaux
Long Le
Tho Le-Ngoc

Chain-Wu Lee
Chi-Han Lee
Hyang-Won Lee
Jason Lee
Juyul Lee
Kyoung-Jae Lee
Janne Lehtomäki
Erik Leitinger
Sergio Lembo
Jose Leon Calvo
Elvio Leonardo
Thierry Lestable
Khaled Letaief
Victor Leung
Bangxu Li
Bojie Li
Changle Li
Changzhen Li
Cheng Li
Danyi Li
Fang Li
Hailing Li
Huan-Bang Li
Hui Li
Jian Li
Jiandong Li
Jianzhi Li
Lei Li
Li Li
Lihua Li
Mengyuan Li
Na Li
Qi Li
Qi Li
Qi Li
Qianrui Li
Qihui Li
Shenghong Li
Si Li
Xi Li
Xiaofan Li
Xiaona Li
Xiaoshuai Li
Xinrong Li
Xinshu Li
Xuhong Li
Y. Li
Yan Li
Yonghui Li
Yongzhao Li
Yu-Jhe Li
Zexian Li
Zhengyi Li
Ben Liang
Wenliang Liang
Xueping Liang
Marco Liebsch
Florian Liedmann
Ilir Limani
Chun-Tao Lin
Jia-Chin Lin
Jiaru Lin
Kate Ching-Ju Lin
Nan Lin
Tsunghan Lin
Wenhui Lin

Zheng Lin
Jonathan Ling
Ramiro Liscano
Chang Liu
Chao Liu
Danpu Liu
Fang Liu
Fangfang Liu
Faqiang Liu
Hang Liu
Jiangchuan Liu
Jianping Liu
Jihong Liu
Jun Liu
Lei Liu
Mengyue Liu
Qingyun Liu
Runzi Liu
Tingting Liu
Weihua Liu
Xinwei Liu
Xinyi Liu
Xue Liu
Yanan Liu
Yang Liu
Yaqiong Liu
Yingzhuang Liu
Yishi Liu
Yitong Liu
Yu Liu
Yuanan Liu
Zhenyu Liu
Zunning Liu
Madhusanka Liyanage
Alberto Loaiza Freire
Vyacheslav Loginov
Miguel López-Benítez
Alexander Lozhkin
George Lu
Guangyan Lu
Jean-Alain Lucciardi
Norbert Ludant
Tao Luo
Andra Lutu
Andrey Lyakhov

M

Lin Ma
Lixiang Ma
Xiaohui Ma
Zheng Ma
Zixiang Ma
Daniel Macedo
Pavel Mach
Jan Machác
Allen MacKenzie
Haji Madni
Toshiyuki Maeda
Jochen Maes
Maurizio Magarini
Elmer Magsino
Muthucumaru Maheswaran
MHD Zaher Mahfouz
Aamir Mahmood
Kashif Mahmood
Petri Mähönen

Sudhan Majhi
Mohammad Majidzadeh
Juha-Pekka Mäkelä
Alli Mäkinen
Behrooz Makki
Derya Malak
Aqsa Malik
Salman Malik
Faton Maliqi
Ivo Maljevic
Mickael Maman
Aarne Mämmelä
Nitin Mangalvedhe
Josep Mangles-Bafalluy
Mohammad Mansour
Mohamad Mantash
Juquan Mao
Qian Mao
Shiwen Mao
XingWang Mao
Yuyi Mao
Zhifei Mao
Brian Mark
Vuk Marojevic
Alberto Marri
Roman Marsalek
Ian Marsland
Luc Martens
Steven Martin
Sofia Martinez Lopez
Barbara Masini
Ahmed Masmoudi
Antonia Maria Masucci
Rudolf Mathar
Kiran Mathews
Aashish Mathur
Hiroki Matsuda
Takahiro Matsuda
Toshiki Matsumine
Takeshi Matsumura
Ryoko Matsuo
Hans-Peter Mayer
David McDonald
Forest Mead
Christoph Mecklenbräuer
Muriel Médard
Dilip Meena
Vahid Meghdadi
Saied Mehdian
Arjan Meijerink
Ameni Mejri
Christopher Mekhiel
Abdelhamid Mellouk
Jordan Melzer
Hamid Menouar
Panayotis Mertikopoulos
Nicolas Merveille
Gilles Mesnager
Achref Methenni
Eduardo Metola
Farouk Mezghani
Yacine Meziti
Zhifang Miao
Diomidis Michalopoulos
Kadoch Michel
Cise Midoglu

Silvia Mignardi
Konstantin Mikhaylov
Tomas Mikulasek
Aleksandar Milenkovic
Manuel Milla
Juan Minango
Yi Ming
Deepak Mishra
Jelena Mišić
Vojislav Mišić
Michel Misson
Toshiya Mitomo
Andreas Mitschele-Thiel
Nathalie Mitton
Ryu Miura
Keiichi Mizutani
Yuji Mizutani
Zoubair Mlika
Preben Mogensen
Preben Mogensen
Abdelrahim Mohamed
Dariush Mohammad Soleymani
Ihab Mohammed
Aleksi Moilanen
Nader Mokari
Mohamed Mokhtar
Andrea Mola
Andreas Molisch
Mohammad Moltafet
Joon Young Moon
Marc Moonen
Roberto Morabito
Antoni Morell
Masahiro Morikura
Hans-Jochen Morper
Nour Mostafa
Abdallah Moubayed
Hussein Mouftah
Alain Mourad
Pedram Mousavi
Aris Moustakas
Imen Mrissa
Markus Dominik Mueck
Jens Mueckenheim
Siraj Muhammad
Paul Muhlethaler
Estefania Munoz Diaz
Hideshi Murai
Kentaro Murata
Yuri Murillo
Osamu Muta
Joyce Mwangama
Stephen Mwanje
Naveen Mysore Balasubramanya
Bhavani Shankar Mysore R

N

Majid Nabi
Amr Nabil
Mehdi Naderi soorki
Masaaki Nagahara
Akihide Nagamine
Kazuo Nagatani
Kshirasagar Naik
Leila Najjar
Mehyar Najla

Kei Nakahara
Hiroyuki Nakamura
Mitsuki Nakamura
Keisuke Nakashima
Takayoshi Nakayama
Imen Nasr
Leila Nasraoui
Ahmed Nasser Ahmed
Galymzhan Nauryzbayev
Carles Navarro Manchón
Chahe Nerguizian
Nataliia Neshenko
Danh Nguyen
Diep Nguyen
Duong Tuan Nguyen
Duy Nguyen
Huan Nguyen
Kim Khoa Nguyen
Quang Huy Nguyen
Thanh-Tin Nguyen
Thi Mai Trang Nguyen
Tri Nguyen
Trung Nguyen
Tu Ngoc Nguyen
Hao Ni
Minming Ni
Qiang Ni
Wei Ni
Shuai Nie
Yao Nie
Yogesh Nijsure
Konstantinos Nikitopoulos
Ioannis Nikolaidis
Nasiha Nikolic
Fan Ning
Muhammad Danish Nisar
Hisashi Nishikawa
Kenichi Nishikawa
Takayuki Nishio
Ronald Nissel
Huaning Niu
Kai Niu
Andrew Nix
Yair Noam
Takahiro Nobukiyo
Jose Nogueira
Michele Nogueira
Andre Noll Barreto
Aria Nosratinia
Janis Nötzel
Hadi Noureddine
James Nutaro

O

Donna O'Shea
Hideki Ochiai
Claude Oestges
Yoji Ohashi
Takenori Ohshima
Daisuke Ohta
Tomoaki Ohtsuki
Dudu Ok
Peter Ökvist
Mohammed Olama
Robert Olesen
Oluwakayode Onireti

Takeo Onishi
Kohei Onizuka
Mehmet Orgun
Daniel Ortiz
Magnus Oskarsson
Tomoya Ota
Nadra Otman
Juergen Otterbach
Björn Ottersten
Yihang Ou
Nouha Oualha
Jad Oueis
Kazuyuki Ozaki
Yigit Özcan
Olav Østerbø

P

Anton Paatelma
Aditya Padaki
Kaveh Pahlavan
Richard Paiement
Nikolaos Pappas
Stephane Paquelet
Ali Parichehreh
Daehee Park
Gi Yoon Park
Hyuncheol Park
Jihong Park
Jinsol Park
Saeedeh Parsaeefard
Bahar Partov
Marco Patane'
D Patel
François Patenaude
Avishek Patra
Matthias Pätzold
Miquel Payaró
Amogh PC
Sasi Pechetti
Divya Peddireddy
Hosein Pedram
Mansi Peer
Berker Pekoz
Yong Peng
Harri Pennanen
Samuel Perez
Ana Pérez-Neira
Jordi Pérez-Romero
Haris Bin Pervaiz
Farhan Pervaz
Dirk Pesch
Juha Petäjäjärvi
Marina Petrova
Fabio Pianese
Marcin Pikus
Laxminarayana Pillutla
Hossein Pishro-Nik
Christian Poellabauer
Christos Politis
Sofie Pollin
Carlos Pomalaza Raez
Radha Poovendran
Dimitrie Popescu
Andrei Popleteev
Wasiu Popoola
Stefan Poslad

Martin Pospíšil
Adrian Posselt
Charly Poulliat
Ari Pouttu
Johannes Prade
Shankar Prakriya
Ganesh Prasad
Serguei Primak
Ales Prokes
Parul Puri
Martin Purvis

Q

Marwa Qararqe
Ji Qi
Kaiqiang Qi
Yuanyuan Qiao
Pengcheng Qiu
Xiaoying Qiu
Bingyu Qu
Zhaowei Qu
Truong Quach

R

Bilel Raddadi
Vimal Radhakrishnan
Kamyar Radnosrati
Carlos Rafael Nogueira da Silva
Vaclav Raida
B. Sundar Rajan
Sujan Rajbhandari
Ali Rakhshan
Xiaoying Ran
Martin Randles
Malalatianna Randriamasy
Anil kumar Rangiseti
Raveendra Rao
Ibrahim Rashdan
Nazanin Rastegardoost
Mehdi Rasti
Rapeepat Ratasuk
Hemant Kumar Rath
Priyadip Ray
Ali Raza
Saleem Raza
S. Mohammad Razavizadeh
Jeffrey Reed
Hazem Refai
Nir Regev
Luca Reggiani
Saeed Rehman
Ghaya Rekaya-Ben Othman
Jinke Ren
Mengying Ren
Pinyi Ren
Yi Ren
Yifang Ren
Zhiyuan Ren
Olivier Renaudin
Vanessa Renno
Brecht Reynders
Sina Rezaei Aghdam
Zouheir Rezki
Roberto Riggio
Janne Riijhjärvi
William Robinson

Ignacio Rodriguez
O. Filio Rodriguez
Tanguy Ropitault
Fernando Rosas
Catherine Rosenberg
Beatrice Rossi
Peter Rost
Richard Rouil
Behnam Rouzbehani
Daniel Roviras
Sumit Roy
Uttam Roy
Yuhan Ruan
Sergio Rueda Linares
Tim Rüegg
Marco Ruffini
Luca Rugini
Markus Rupp
Fredrik Rusek
Humphrey Rutagemwa

S

Thomas Valerrian Pasca S
Walid Saad
Harri Saarnisaari
Omid Saatlou
Carlos Saavedra
Ayman Sabbah
Arash Saber Tehrani
Aroua Sabrine
Tomoki Sada
Hamid Saeedi
Majid Safari
Min Sagong
Alphan Sahin
Biswa PS Sahoo
Karim Said
Leila Azouz Saidane
Hiroshi Saito
Yuya Saito
Mohammad Salahuddin
Hojjat Salehinejad
Oriol Sallent
Malla Reddy Sama
Lutfi Samara
Dragan Samardzija
Abdelaziz Samet
Réjean Samson
Simon Samuel
Yukitoshi Sanada
Eshaan Sangodkar
Seun Sangodoyin
Aldri Santos
Muris Sarajlic
Hadi Sarieddeen
Shunsuke Saruwatari
Motoharu Sasaki
Koya Sato
Gandeva Satrya
Zeeshan Sattar
Ryo Sawai
Prakriti Saxena
Rob Saxon
Bessem Sayadi
Kamran Sayrafian
Lokman Sboui

Davide Scazzoli
Lucas Scheuvers
Anke Schmeink
Johannes Schmitz
Dirk Schmoltzi
Peter Schneider
Sebastian Scholz
Hans Schotten
Vincenzo Sciancalepore
Gokhan Secinti
Saeid Sedighi
Boon-Chong Seet
Hafez Seliem
Hiroaki Senoo
Jihoon Seo
Ji-Yun Seol
Semih Serbetli
Marie Françoise Servajean
Ahmad Sghaier Omar
Ahmed Shaban
Syed Awais Wahab Shah
Shahram Shah Heydari
Reza Shahidi
Shervin Shahidi
Hmaied Shaiek
Muhammad Zeeshan Shakir
Abdallah Shami
Md Hosne Mobarok Shamim
Rajan Shankaran
Mohammad S. Sharawi
Ekant Sharma
Nikhil Sharma
Shree Krishna Sharma
Ryan Shea
Mohamed Shehata
Bin Shen
Haihua Shen
Jie Sheng
Min Sheng
Sachin Shetty
Chenhua Shi
Qingjiang Shi
Zhenyu Shi
Basem Shihada
Mohammad Shikh-Bahaei
Masahiko Shimizu
Takayuki Shimizu
Toshihiro Shimura
Soo Young Shin
Wooram Shin
Teruyoshi Shinagawa
Shervin Shirmohammadi
Mahyar Shirvanimoghaddam
Wanyi Shiu
Saeed Shojaee
Arman Shojaeifard
Anupam Shome
Guochu Shou
Raed Shubair
Yishui Shui
Zhongwei Si
Alain Sibille
Muhammad Shuaib Siddiqui
Aman Sikri
Lucas Silva
Wendley Silva

Bilhanan Silverajan
Anantha Simha
Ljiljana Simic
David Simmons
Arne Simonsson
Meryem Simsek
Simran Singh
Chetna Singhal
Zhenhui Situ
Eric Slottke
Sinda Smirani
Ashkan Sobhani
Hamza Sokun
John Camilo Solano Arenas
Hossein Soleimani
Maliheh Soleimani
Samy Soliman
Mohammad Dehghani Soltani
Jae-Su Song
Sami Souihi
Robin Joe Prabhakar Soundar Raja
James
Elvino Sousa
Kevin Sowerby
Troels Sørensen
K Venkata Srinivas
Anand Srivastava
Razvan Stanica
Alex Stéphenne
Mikael Sternad
Thomas Stifter
Mathias Strufe
Hsuan-Jung Su
Xiaonan Su
Cristo Suarez-Rodriguez
Norisato Suga
Nabeel Sulieman
Andy Sun
Jiaxin Sun
Liang Sun
Mengying Sun
Shaohui Sun
Yuhang Sun
Dennis Sundman
Chang Kyung Sung
Luiz Henrique Suraty Filho
Takayuki Suzuki
Milan Svanda
Tommy Svensson
Philipp Svoboda
M. N. S. Swamy
Péter Szilágyi

T

Shadha Tabatabai
Omid Taghizadeh
Aya Taha
Nada Taher
Shao-Heng Tai
Yoshiharu Tajima
Eiji Takahashi
Yasuhiro Takano
Yasushi Takatori
Nobuyasu Takemura
Tetsuya Takine
Salvatore Talarico

Justin Tallon
Ken Tamanoi
Bheemarjuna Reddy Tamma
Rakesh Tamrakar
Xiao Tang
Xiaoxuan Tang
Kentaro Taniguchi
Xiaofeng Tao
Shah Ahsanuzzaman Md Tariq
Kiichi Tateishi
Serioja Ovidiu Tatu
Marcos Tavares
Mohammed Teeti
Miead Tehrani Moayyed
Stephan ten Brink
Adam Tenenbaum
Miurel Tercero
Kosuke Terui
Nuutti Tervo
Gautam Thakur
Lakshmi Narasimhan Theagarajan
Quang-Tuan Thieu
Nathalie Thomas
Henning Thomsen
Hui Tian
Lei Tian
Shuang Tian
Fai Tila
Olav Tirkkonen
Pooja Tiwari
Mohammed Amine Togou
Sivan Toledo
Antti Tölli
Maniwa Toru
Vahid Towhidlou
Kentaro Toyoda
Duc Tran
Ha-Vu Tran
Hung Tran
Imene Trigui
Imen Triki
Hoang Duy Trinh
Allan Tsai
Tzung-Hua Tsai
Aragorn Tseng
Yu-Chee Tseng
Eng Tseng Lau
Paschalis Tsiaflakis
Theodoros Tsiftsis
Fredrik Tufvesson
Yupeng Tuo
Esma Turgut
Daniel Tweed

U

P Ubaidulla
Fawad Ud Din
Takumi Uekumasu
Elisabeth Uhlemann
Arijit Ukil
Irfan Ullah
Kenta Umebayashi
Momin Uppal
Luis Guilherme Uzeda Garcia

V

Vutha Va
Iman Vakiliinia
Shahin Vakiliinia
Shahrokh Valaee
Martin Valdez-Vivas
Stefan Valentin
Fabrice Valois
Wim van Houtum
Luc Vandendorpe
Lorenzo Vangelista
Thomas Varela Santana
József Varga
Kasturi Vasudevan
Rodolphe Vauzelle
Farhang Vedadi
Goutham Veeramachaneni
Roope Vehkalahti
Neco Ventura
Véronique Vèque
Roberto Verdone
Jeroen Verdyck
Giacomo Verticale
Sudip Vhaduri
Jose Vicario
Joao Vieira
Robson Vieira
Mikhail Vilgelm
Alexey Vinel
Evgenii Vinogradov
Harish Viswanathan
Quynh Vo
Baptiste Vrigneau
Branka Vucetic
Satyanarayana Vuppala
Maunil Vyas
Josef Vychodil

W

Rachel Wakim
Julien Walzberg
Bingcheng Wang
Chengxiang Wang
Chin-Liang Wang
Chun Wang
Chun-Hsiung Wang
Dan Wang
Danyang Wang
Dongyu Wang
Gaojian Wang
Guoqiang Wang
Hua Wang
Huiyang Wang
Jheng-Jyun Wang
Jian Wang
Jinlong Wang
Junhu Wang
Kuochen Wang
Li-Chun Wang
Lin Wang
Maoyu Wang
Ning Wang
Qi Wang
Qi Wang
Qinglong Wang

Qingtian Wang
Qinlong Wang
Rui Wang
Rui Wang
Rui Wang
Shuo Wang
Wenhui Wang
Xianbin Wang
Xiangyu Wang
Xiaodong Wang
Xiaojie Wang
Xiaoxiang Wang
Xiaoxiang Wang
Xiaoyi Wang
Xin Wang
Xin Wang
Xueyuan Wang
Xuyu Wang
Yafeng Wang
Yanru Wang
Yi Wang
Yinyan Wang
Yonggang Wang
Yongming Wang
Yu Wang
Yu Wang
Yuanquan Wang
Yue Wang
Yuhao Wang
Yumei Wang
Zhe Wang
Zheng Wang
Zhi qiang Wang
Zi Qi Wang
Abubaker Matovu Waswa
Fumio Watanabe
Takashi Watanabe
Lanier Watkins
Nuwan Weerasinghe
Hung-Yu Wei
Lu Wei
Wu Wei
Yunkai Wei
Zhiqing Wei
Jay Weitzen
Bo Wen
Yun Wen
Chang Wenting
Charles Wiame
Joerg Widmer
Christian Wietfeld
Jeroen Wigard
Francesc Wilhelm
Leif Wilhelmsson
Frans Willems
Armin Wittneben
Kai Kit Wong
Colin Wright
Beihua Wu
Huan Wu
Huici Wu
Jiajun Wu
Peiran Wu
Qihui Wu
Sau-Hsuan Wu
Shaohua Wu

Xin-Wen Wu
Yabin Wu
Ye Wu
Dov Wulich
Gerhard Wunder

X

Bin Xia
Kaixi Xia
Minghua Xia
Wei Xiang
Weidong Xiang
Pei Xiao
Yao Xiao
Yue Xiao
Gui Xin
'Easton' Li Xu
Chengzhong Xu
Datong Xu
Dingjie Xu
Dongyang Xu
Jin Xu
Jinkun Xu
Shaoyi Xu
Tianyi Xu
Tongyang Xu
Wen Xu
Xiaodong Xu
Zhiheng Xu
Junli Xue

Y

Michel Daoud Yacoub
Wataru Yamada
Kohei Yamamoto
Koji Yamamoto
Chenyang Yang
En-hui Yang
Fan Yang
Hongwen Yang
Jie Yang
Jing Yang
Juwo Yang
Kan Yang
Kun Yang
Kun Yang
Luxi Yang
Ning Yang
Pengbo Yang
Shuo Yang
Teng Yang
Xiaodong Yang
Zhe Yang
Zihua Yang
Gao Yangshui
Halim Yanikomeroglu
Kazuto Yano
Chun-Han Yao
Rumana Yasmin
Qiubo Ye
Zeqian Ye
Shu-ping Yeh
Kamya Yekeh Yazdandoost
Phee Lep Yeoh
Xinghui Yi
Changchuan Yin

Sixing Yin
Julang Ying
Xuhang Ying
Mika Ylianttila
Ilia Yoffe (Iofedov)
Abbas Yongacoglu
Chanho Yoon
Makoto Yoshida
Masafumi Yoshioka
Akihito Yoshito
Irfan Yousaf
Amr Youssef
Neji Youssef
Guanding Yu
Jianguo Yu
Jiawei Yu
Jung-Lang Yu
Junyi Yu
Lei Yu
Shuai Yu
Tzu-Yang Yu
Wei Yu
Xiangshen Yu
Yawei Yu
Zhen Yu
Xueying Yuan
Xiaochun Yun
Merve Yuzgecciglu

Z

Benjamin Zaidel
Abdellatif Zaidi
Slim Zaidi
Syeda Kanwal Zaidi
Marzia Zaman
Pouria Zand
Alberto Zanella
Yunpeng Zang
Alessio Zappone
Sophie Zareei
Keyvan Zarifi
Nagina Zarin
Rafik Zayani
Djamal Zeglache
Bei Zhang
Biling Zhang
Chaoxian Zhang
Congchi Zhang
Didi Zhang
Feng Zhang
Guodong Zhang
Haibo Zhang
Hailin Zhang
Heli Zhang
Hongtao Zhang
Jianhua Zhang
Jianjun Zhang
Jiazhen Zhang
Jinyu Zhang
Jun Zhang
Jun Zhang
Kezhong Zhang
Lei Zhang
Lei Zhang
Lei Zhang
Lin Zhang

Minglong Zhang
Ping Zhang
Qinyu Zhang
Qixun Zhang
Rui Zhang
Ruiqi Zhang
Shengli Zhang
Shiqing Zhang
Shunliang Zhang
Weile Zhang
Xiaoshuai Zhang
Xing Zhang
Xinyi Zhang
Xuefei Zhang
Yan Zhang
Yibo Zhang
Yongzheng Zhang
Yufang Zhang
Yuhao Zhang
Zhenduo Zhang
Zhengquan Zhang
Juan Zhao
Jun Zhao
Minjian Zhao
Qiang Zhao
Shulun Zhao
Sicong Zhao
Wen Zhao
Yubin Zhao
Fu-Chun Zheng
Kan Zheng
Pei Zheng
Zhe Zheng
Zhangdui Zhong
Liang Zhou
Runfa Zhou
Xiangwei Zhou
Yanquan Zhou
Yongxing Zhou
Zhengyuan Zhou
Zichao Zhou
Fusheng Zhu
Haiying Zhu
He Zhu
Peiying Zhu
Quanyan Zhu
Xiaomei Zhu
Xiru Zhu
Xu Zhu
Yan Zhu
Yujia Zhu
Jeffrey Zielinski
Wolfgang Zirwas
Milan Zivkovic
Stanislav Zvanovec

SPONSORS AND PATRONS

Financial Co-Sponsors:



Gold Patron:



Silver Patrons:



Co-Organizers:



Partners and Co-exhibitors:



PATRON PROFILES

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 Electrical/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.

INTERDIGITAL (<http://www.interdigital.com/>)

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 approximately 180 engineers – approximately 80 percent of whom hold advanced degrees, including 60 PhDs – has unparalleled expertise in major mobile connectivity and content delivery technologies. Since 2000, InterDigital has spent over \$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.

COGECO INC.

Cogeco Inc. is a diversified holding corporation which operates in the communications and media sectors. Through its Cogeco Communications Inc. subsidiary, Cogeco provides its residential and business customers with video, Internet and telephony services through its two-way broadband fibre networks. Cogeco Communications Inc. operates in Canada under the Cogeco Connexion name in Québec and Ontario, and in the United States under the Atlantic Broadband name in western Pennsylvania, south Florida, Maryland/Delaware, South Carolina and eastern Connecticut. Through Cogeco Peer 1, Cogeco Communications Inc. provides its business customers with a suite of information technology services (colocation, network connectivity, hosting, cloud and managed services), through its 16 data centres, extensive FastFiber Network® and more than 50 points of presence in North America and Europe. Through its subsidiary Cogeco Media, Cogeco owns and operates 13 radio stations across most of Québec with complementary radio formats serving a wide range of audiences as well as Cogeco News, its news agency. Cogeco's subordinate voting shares are listed on the Toronto Stock Exchange (TSX: CGO). The subordinate voting shares of Cogeco Communications Inc. are also listed on the Toronto Stock Exchange (TSX: CCA).

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.

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.

NSERC (<http://www.nserc-crsng.gc.ca>)

NSERC aims to make Canada a country of discoverers and innovators for the benefit of all Canadians. The agency supports university students in their advanced studies, promotes and supports discovery research, and fosters innovation by encouraging Canadian companies to participate and invest in postsecondary research projects. NSERC researchers are on the vanguard of science, building on Canada's long tradition of scientific excellence.



Preliminary Call for Papers

Bologna is a historical city, with around 380 000 inhabitants, and represents a compulsory point of passage between the North and South of Italy, from which the most attractive historical Italian cities such as Venice, Florence and Rome can be conveniently reached by train or car. The University of Bologna, founded in 1088, is considered the most ancient University in the western world. Its history is one of great thinkers in science and the humanities, making it an indispensable point of reference in the panorama of European culture. For nearly a thousand years, the city of Bologna has witnessed and participated in the production of knowledge and the development of technological innovations. Bologna is also the city of Guglielmo Marconi, where he did the first wireless communication experiment in 1895. Inspired by this, PIMRC welcomes original research and developments in all areas of wireless technology.

General Chair

Roberto Verdone, Univ. Bologna, IT

General Vice-Chair

Luis M. Correia, IST-Univ. Lisbon, PT

TPC Chair

Davide Dardari, Univ. Bologna, IT

Track Co-Chairs

Alister Burr, Univ. of York, UK
Tadashi Matsumoto, JAIST, JP
Octavia Dobre, Memorial Univ., CA
Oliver Holland, King's College London, UK
Kentaro Ishizu, NICT, JP
Kamran Sayrafian, NIST, US
Silvia Ruiz Boqué, UPC, ES
Tony Quek, Singapore Univ., SG
Ismail Guvenc, North Carolina State Univ., US
Luis Muñoz, Univ. Cantabria, ES
George Chrisikos, Qualcomm, US

Awards Chair

Andrea Giorgetti, Univ. Bologna, IT

Panels Co-Chairs

Matti Latva-aho, Univ. Oulu, FI
Bosco Fernandes, COMCON, DE

Special Sessions Co-Chairs

Mohammad Sheikh-Bahaei, King's College
London, UK

Michel Yacoub, Univ. Campinas, Brazil

Tutorials Co-Chairs

Narcis Cardona, UPV, ES
Elvino Sousa, Toronto Univ., CA

Workshops Co-Chairs

Hanna Bogucka, Poznan Univ. of Technology, PL
Chun-Ting Chou, National Taiwan Univ., TW

Patrons Chairs

Hikmet Sari, FR

Financial Chair

Chiara Buratti, Univ. Bologna, IT

Publication Co-Chairs

Gianni Pasolini, Univ. Bologna, IT
Margot Deruyck, Univ. Ghent, BE

Local Arrangements Chair

Lucia Vitiello, Univ. Bologna, IT

Publicity Co-Chairs

Hyundong Shin, Kyung Hee Univ., KR
Yuan Shen, Tsinghua Univ., CN
Claude Oestges, Univ. Louvain, BE
Adrian Kliks, Poznan Univ. Technology, PL
Pau Closas, Northeastern Univ., US
Andres Navarro, ICESI Univ., CO

Webmasters

Luca Feltrin, Univ. Bologna, IT
Silvia Mignardi, Univ. Bologna, IT

EDAS Administrator

Flavio Zabini, Univ. Bologna, IT

Steering Committee

Hamid Aghvami, King's College London, UK
Luis M. Correia, IST-Univ. Lisbon, PT
Shuzo Kato, Tohoku Univ., Sendai, JP
Kaveh Pahlavan, WPI, USA
Roberto de Marca, PUC, BR

Prospective authors are invited to submit technical papers of their previously unpublished work. Topics of interest should be included within the following Tracks:

Track 1: Fundamentals and PHY

Track 3: Mobile and Wireless Networks

Track 2: MAC and Cross-Layer Design

Track 4: Services, Applications, and Business

Important Dates

Full paper submission: March 23, 2018

Notification of acceptance: June 8, 2018

Final Manuscript: June 29, 2018

Complete information about the electronic paper submission process will be made available at the conference website, <http://pimrc2018.ieee-pimrc.org>. All accepted and presented papers will be submitted to IEEE Xplore.

IEEE **pimrc'17**



**IEEE International Symposium on Personal,
Indoor and Mobile Radio Communications**

info@pimrc2017.org
www.pimrc2017.org

Thank you!

DRIVING GROWTH

Unique and first in Canada, PERSWADE is an advanced research training program in wireless and its application sectors. **+**

Industrial Partners:

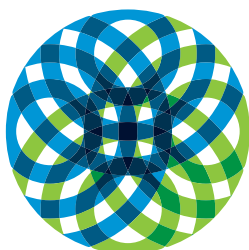
Cogeco
Ericsson
Focus Microwaves
Huawei
Institut de recherche d'Hydro-Québec
Industry Canada
InterDigital
MDA
Nutaq
Ultra Electronics

Academic Partners:



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 Centre of INRS

Lead institution:



Funded by:

