WTS 2018

Wireless Telecommunications Symposium 2018

Global Wireless Communications: Theory and Practice

April 17 - 20, 2018

California State Polytechnic University, Pomona

Ocotillo Golf Resort
Phoenix (Chandler), AZ, USA

WELCOME TO WTS 2018

Welcome to the seventeenth annual Wireless Telecommunications Symposium, WTS 2018, "Global Wireless Communications: Theory and Practice." We hope that it will be a stimulating and rewarding experience for you. During the next three days of invited speakers' presentations, accepted paper sessions, tutorials and a panel discussion, WTS 2018 will explore a wide range of multidisciplinary wireless communications, mobile computing, and emerging media topics in depth.

The WTS 2018 Technical Program Committee received paper submissions from authors around the world, covering a wide area of topics. We thank all the authors who submitted papers and proposals to WTS 2018, the many reviewers who reviewed them, and the co-chairs, mini-symposium chairs, track chairs and technical program committee members for coordinating the paper and proposal evaluation and selection process. We also thank the WTS support personnel for their tireless efforts and contributions behind the scene. Producing an event like WTS 2018 is not an easy task, and they did a masterful job. In addition, the WTS Committee is grateful to the IEEE Communications Society, and its Communications & Information Security Technical Committees for their technical support for WTS 2018, and to the distinguished invited speakers representing the global wireless telecommunications industry for having taken time to participate in the conference and help us organize the program.

Finally, special thanks go to many organizations that have contributed to the conference or lent it financial support. Notable among the contributors and donors are Cal Poly Pomona's College of Business Administration and College of Engineering; and Cal Poly Pomona's Computer Information Systems and Electrical & Computer Engineering Departments.

On behalf of the WTS 2018 Committee -- Welcome to WTS 2018!

Dr. Steven Powell, WTS General Chair
Dr. Thomas Ketseoglou, WTS Assistant Chair

WTS 2018 Program April 17-20, 2018
Ocotillo Golf Club
Phoenix (Chandler), AZ, USA

Tuesday, April 17 Ocotillo Golf Club	
2:00 pm – 5:30 pm	Tutorial: Trends in Evolution of Mobile Wireless Infrastructure, An Industry Perspective **Dr. Habib Riazi and Dr. Aravind Chamart** Corning Optical Communications Wireless Inc. **Dr. Durga Satapathy** Director of Technology Innovation & Architecture, Sprint
5:30 pm – 9:00 pm	WTS Organizers' Meeting
Wednesday, April 18 Ocotillo Golf Club	
8:00 am - 9:00 am	Registration
9:00 am – 9:15 am	Welcoming Remarks
9:15 am – 10:00 am	**Dr. Erik Rolland** Dean, College of Business Administration California State Polytechnic University, Pomona
10:00 am – 10:30 am	Break
10:30 am – 11:15 am	"5G NR: Theory and Practice for a Unified, More Capable 5G Air Interface" **Dr. John Smee** VP of Engineering, Qualcomm Technologies, Inc.
11:15 am – 12:00 pm	**Dr. Larry Head** Professor of Systems and Industrial Engineering and Director of the Arizona Transportation Research Institute University of Arizona

12:00 pm – 2:00 pm	Lunch "Incumbents strike back - Insights from the global C-suite study" Guest Speaker: **Dr. Rob van den Dam** Global Telecommunications Industry Leader, Institute for Business Value IBM
2:00 pm – 2:45 pm	"Mobile App Markets - Rankings, Recommendations and Success" **Dr. Raghu Santanam** McCord Chair in Business, W. P. Carey School of Business Professor and Department Chair, Department of Information Systems Arizona State University
2:45 pm – 3:00 pm	Break
3:00 pm – 4:45 pm	"Interdisciplinary Topics in Wireless Communications" Organizer: **Dr. Giti Javidi**, University of South Florida "The Impact of Wireless Telecommunications from a Cyber Security and Digital Forensics Perspective" **Dr. Gregory Carlton**, California State Polytechnic University "Smart Health and Internet of Things: Advances and Challenges" **Dr. Theofilos Chrysikos**, University of Patras "Emerging Media - Fake News: The European Union's Response" **Dr. Vassiliki Cossiavelou**, Youth and Media Lab, University of the Aegean "Internet of Things: Multi-Faceted Perspectives" **Dr. J.P. Shim**, Georgia State University "Connectivity of the Internet of Things (IoT)" **Dr. Qing-An Zeng**, North Carolina A&T State University

4:45 pm – 5:30 pm	"RF Convergence – Spectrum Sharing by Communications, Radar, and More" **Prof. Daniel W. Bliss** Director of the Center for Wireless Information Systems and Computational Architectures Associate Professor in the School of Electrical, Computer, and Energy Engineering Arizona State University
5:30 pm – 9:00 pm	Welcoming Reception & Dinner WTS Organizer Recognition Ceremony "The Future as seen through Software Glasses - Why, What, and How" Guest Speaker: **Dr. Markus Hofmann** Head of Application Platforms & Software Systems Research Nokia Bell Labs
Thursday, April 19 Ocotillo Golf Club	
9:00 am – 10:00 am	Tutorial: Part I "Flexible Radio Access Beyond 5G: A Future Projection" **Dr. Huseyin Arslan** Professor, Electrical Engineering Department University of South Florida
10:00 am – 10:15 am	Break
10:15 am – 12:00 pm	Tutorial: Part II "Flexible Radio Access Beyond 5G: A Future Projection" **Dr. Huseyin Arslan** Professor, Electrical Engineering Department University of South Florida
12:00 pm - 2:00 pm	Lunch Guest Speaker: **Dan Gillmor** Director and Co-founder, News Co/Lab and Professor of Practice Walter Cronkite School of Journalism & Mass Communication Arizona State University
2:00 pm – 2:45	**Special Agent Paul Schaaf** Cyber Task Force Coordinator for the Phoenix Division and Co-Coordinator to the Infragard Program

pm	FBI
2:45 pm – 3:00 pm	Break
3:00 pm – 5:00 pm	"Security Perspective: And now the end is near…" **Dr. Francois Cosquer** CTO Security for Nokia Software Nokia
5:00 pm – 5:30 pm	Poster Paper Session
5:30 pm – 9:00 pm	Dinner and Coach Tour
Friday, April 20 Ocotillo Golf Club	
7:30 am – 10:10 am	Paper Presentation Session (I)
10:10 am – 10:20 am	Break
10:20 am – 12:00 noon	Paper Presentation Session (II)
12:00 noon – 1:20 pm	Lunch Best Paper Awards Ceremony
1:20 pm – 3:20 pm	Paper Presentation Session (III)

3:20 pm – 3:30 pm	Break
3:30 pm – 7:00 pm	Paper Presentation Session (IV)

Panel Discussions & Tutorials

Panel Session: Interdisciplinary Topics in Wireless Communications

Abstract:
Wireless communications is a very broad field encompassing many subject areas and disciplines. An interdisciplinary viewpoint, emphasizing the field's technological, management, policy, security, and application foundations, is necessary when examining it. To demonstrate the breadth of wireless communications and its interdisciplinary nature, this session will bring together a group of researchers with diverse backgrounds to discuss issues of current interest, including IoT, digital forensics, smart health, and emerging media.

Organizer: Dr. Giti Javidi, University of South Florida

Presenters include:

"The Impact of Wireless Telecommunications from a Cyber Security and Digital Forensics"
Dr. Gregory Carlton, California State Polytechnic University, Pomona

"Smart Health and Internet of Things: Advances and Challenges"
Dr. Theofilos Chrysikos, University of Patras

"Emerging Media - Fake News: The European Union's Response"
Dr. Vassiliki Cossiavelou, Youth and Media Lab, University of the Aegean

"Internet of Things: Multi-Faceted Perspectives"
Dr. J.P. Shim, Georgia State University

"Connectivity of the Internet of Things (IoT)"
Dr. Qing-An Zeng, North Carolina A&T State University

Presentation Abstracts:

"The Impact of Wireless Telecommunications from a Cyber Security and Digital Forensics Perspective"
Dr. Gregory Carlton, California State Polytechnic University, Pomona

Without question, the rapidly expanding galaxy of wireless telecommunications, and the general universe of data communications impact the lives of the majority of individuals within the developed world. These technological advances that improve our lives bring with them by-products that are detrimental to our wellbeing. Unfortunately, as more people are connected, more access is available to criminals that seek to exploit this cyber world. Even the masses of non-technical data communications users now recognize the importance of cyber security to protect their information assets, including tangible financial assets. Cyber security techniques seek to prevent unauthorized events, and digital forensics techniques seek to provide evidence within the legal environment to deter crime and provide restitution to the victims.

"Smart Health and Internet of Things: Advances and Challenges"
Dr. Theofilos Chrysikos, University of Patras

Reaching out to almost every aspect of upcoming technological advances, the Internet of Things (IoT) is expected to provide an eco-system in smart and mobile health applications. Body Area Networks (BAN) provide a complex propagation environment with many challenges and intrinsic characteristics. The need for a new generation of bio-sensors and recent advances in on-body and in-body channel modeling pave the way for new solutions and immediate future work concerning the real-time monitoring of patients. The reliability of these designated solutions depends strongly on the robust deployment of IoT in, on and around the human body. The panelist will discuss recent findings and the next steps necessary in the direction of modern-day and future smart health platforms.

"Emerging Media - Fake News: The European Union's Response"
Dr. Vassiliki Cossiavelou, Youth and Media Lab, University of the Aegean

Emerging media is coming together with emerging challenges in the online media ecosystem, like fighting fake news, for the benefit of netizens and the New Economy. Last summer, the European Parliament (EP) had called on the European Commission (EC) to verify the possibility of legislative intervention to limit the dissemination of fake content. Recently, the EC appointed 39 experts to the High-Level Group (HLEG) on Fake News and Online Disinformation. The HLEG will advise the EC on defining the roles and responsibilities of relevant stakeholders, grasping the complex and international dimension, and contributing to the development of an EU-level strategy on the issue by spring 2018. Representatives of the civil society, social media platforms, news media organizations, journalists and academia of HLEG in regulatory level and social networks, online platforms and startups in implementation level are dealing with methodologies ranging from simple fact checking to Artificial Intelligence (AI) approaches to diminish in almost real time the consequences of spreading fake news from real or fake profiles online. The European Union is today the first and only institutional response in global level to fake news issue.
The panelist will analyze the role of the EU in fighting fake news and disinformation over current online and emerging media in both regulatory and implementation level.

"Internet of Things: Multi-Faceted Perspectives"
Dr. J.P. Shim, Georgia State University

The Internet of Things (IoT) is a leading-edge and sensational topic in Information Systems field. In a hyper-connected economy and environment, IoT can transform business and society radically. Numerous physical devices are being produced with software and connectivity, making then what is commonly referred to as 'smart devices'. The connectivity can be described as instrumented, interconnected, and intelligent. Building on research experiences on IoT, the panelist will highlight multi-faceted perspectives about Internet of Things, i.e., devices; connection efficiency; platform and standards; data analytics; data monetization; security/cybersecurity, privacy, and compliances; and blockchain technology and IoT.

"Connectivity of the Internet of Things (IoT)"
Dr. Qing-An Zeng, North Carolina A&T State University

The Ethernet/Internet network system was first described on May 22, 1973 in a memo. It had been invented for interconnecting advanced computer

workstations, making it possible to send data to one another and to high-speed laser printers. Nowadays, the Internet has already become the core communication backbone for connecting electronic devices working anywhere, anytime. This has given rise to the Internet of Things (IoT). Therefore, how to establish the connectivity among different electronic devices has become an emerging technology. In this presentation, we focus on discussing the connectivity of the IoT. Most of the popular network infrastructures/topologies, access protocols, and communication protocols are introduced and discussed. For example, the connectivity of wired-/wireless-based networks, centralized or distributed networks, and integrated heterogeneous networks is introduced and discussed. How to connect the devices, what access/communication protocol should be used, and what local network performance can be reached are the challenging issues.

Tutorial: Trends in Evolution of Mobile Wireless Infrastructure, An Industry Perspective

Dr. Habib Riazi, and Dr. Aravind Chamarti,
Corning Optical Communications Wireless Inc.

Dr. Durga Satapathy,
Director of Technology Innovation & Architecture, Sprint

Abstract
There has been ample research and focused academic work, suggesting improvements and guiding new technologies, for mobile wireless radio access and architecture. The purpose of this tutorial is to provide a broad perspective on the drivers and latest trends affecting changes and continued modernization of commercial mobile wireless infrastructure. We will review the shortcomings with respect to the growing data traffic, inefficiencies in spectrum utilization, capital expenditure and operating cost concerns. Then review enabling developments in the areas of spectrum repurpose and promising economic efficiencies of developing technologies such as; SDR, NFV, C-RAN, and 4G progression to 5G. We take a look at challenges in physical implementation and the facilitating engineering innovations. The purpose of this tutorial is to provide a broad insight and perspective on the system evolution. In the course of discussions, we will also identify relevant references and major influencers for further investigation into specific areas of interest.

Tutorial Outline:

This tutorial will try to present the importance of current and ongoing trends in mobile wireless industry and its professional, technical, and business impact. This tutorial will be delivered in three sessions of one hour each.

- In the first session, Habib will give a high-level overview of today's complex global wired and wireless networks that is supporting human connectivity and applications thereof. He will discuss the impending evolution of adding things to this web of connectivity and resulting convergence of our digital and physical world. Will highlight the pace setting global harmonization which has contributed to the economy of scale and phased but rapid technological development. Will discuss the need to transition to a new air interface in the next generation of wireless standard and briefly discuss the technical reasons supporting these changes as compared with the current state of the art. Habib's presentation sets the stage for more detailed insight provided in the next two sessions of this tutorial.
- In the second session, Aravind will discuss the role of user equipment (UE) location technologies and sensors in context generation for IoT. He reviews the Internet of Things ((IoT), big data, artificial intelligence (AI), and context. He explains importance of UE in context generation. Then illustrates relation of location and context and describes various UE location technologies; including UE-based, network-based, and AGPS-based. He will highlight the impact of smartness and privacy and importance of security.
- In the third and final part, Durga will discuss trends in mobile wireless radio access and architecture from a tier one and major service provider's vantage point — including some that are new and others that are known but becoming more relevant and practical. He will broadly address areas of evolution in radio access networks, backhaul, core, and devices. In particular, trends that contribute to spectral efficiency enhancement, coverage extension, capacity growth, deployment ease, etc. will be highlighted. These include Massive MIMO, Full Duplex, Spectrum Approach (Carrier Aggregation, Unlicensed Bands, Millimeter Wave Bands etc.), Densification with Small Cells, Virtualization, IOT, V2X, 4G to 5G Evolution etc. He illustrates some challenges in implementing these solutions and provide an operator's perspective in leveraging such solutions for systems evolution.

Tutorial: Flexible Radio Access Beyond 5G: A Future Projection

Dr. Huseyin Arslan, Professor, Electrical Engineering Department, University of South Florida

Abstract:
Today's wireless services and systems have come a long way since the rollout of the conventional voice-centric cellular systems. The demand for wireless access in voice and multimedia applications has increased tremendously. In addition to these, new application classes like extreme mobile broadband communication, ultra reliable and low latency communications, massive machine type communications, and Internet of Things have gained significant interest recently for 5G. The trend on the variety and the number of mobile devices along with the mobile applications will certainly continue beyond 5G, creating a wide range of technical challenges such as cost, power efficiency, spectrum efficiency, extreme reliability, low latency, robustness against diverse channel conditions, cooperative networking capability and coexistence, dynamic and flexible utilization of wireless spectrum. In order to address these technical challenges, 5G waveforms and radio access technologies (RATs) should be much more flexible. The current 4G systems rely on the orthogonal frequency multiple access (OFDM) waveform, which is not capable of supporting the diverse applications that 5G and beyond will offer. This is because the traffic generated by 5G and beyond is expected to have radically different characteristics and requirements when compared to current wireless technology. For 5G to succeed, numerous waveform alternatives have been explored to best meet its various technical requirements. However, none of the alternatives were able to address all the requirements at the same time.

During the standardization of 5G, one thing has become certain: there is no single enabling technology that can achieve all of the applications being promised by 5G networking. This will be even more pronounced beyond 5G. For this purpose, the concept of using multiple OFDM numerologies, i.e., different parameterization of OFDM based subframes, within the same frame has been proposed in 3GPP discussions for 5G. This concept will likely meet the current expectations in multiple service requirements to some extent. However, since it is almost obvious that quantity of wireless devices, applications, and heterogeneity of user requirements will keep increasing towards the next decade(s), the sufficiency of the aforementioned flexibility level remains quite disputable considering future expectations. Therefore, novel RATs facilitating much more flexibility are needed to address the aforementioned technical problems. In this tutorial, we will discuss the potential directions to achieve further flexibility in RATs beyond 5G. In this context, a framework for developing flexible waveform, numerology, and frame design strategies will be discussed along with sample methods in this direction. We will

also discuss their potential role to handle various issues in the upper system layers.

List of Topics:
The tentative outline of the tutorial will be as follows:
• Channel and waveform
• Application and waveform
• Introduction to OFDM and Multi-Carrier Modulation
• OFDM advantages and problems
• Adaptive, Flexible & Cognitive OFDM
• Other Important Waveforms (SC-FDE, SC-FDMA, DFT-s-OFDM, UW-OFDM, etc.)
• Numerology and OFDM (OFDM variants from OFDM baseline)
• Future concepts in Waveform:
o mmWave waveform design (SC versus MC in mmWave)
o Hybrid waveforms
o Flexible waveforms
o Non-orthogonal waveform design
o Differential modulation (non-coherent modulation) in OFDM (minimal pilot OFDM design)
o PHY security in OFDM (secure OFDM design)

WTS 2018 Paper Presentation Sessions
Friday, April 20, 2018

Friday, April 20 **Ocotillo Golf Club**	
	International Journal of Interdisciplinary Telecommunications & Networking **Papers and Invited Presentations**

7:30 am – 10:10 am	I-A Wireless Security & Smart Health *An Enhanced Handover Scheme to Avoid Duplication Authentication in Proxy Mobile Ipv6* Hewei Yu And Ziliang Li (South China University of Technology, P.R. China) *Efficient Unsupervised Learning to Secure Communication for Wireless Sensor Network Middleware* Remah A. Alshinina (University of Bridgeport, USA); Khaled M. Elleithy (School Of Engineering, University Of Bridgeport, USA) *A Self Organizing Map Intrusion Detection System for RPL Protocol Attacks* Roger Achkar, Elie Kfoury And Julien Saab (American University Of Science And Technology, Lebanon); Paul Younes (American University Of Science And Technology &Amp; Lebanon, Lebanon) *Attack-Tree Based Risk Assessment on Cloud-Oriented Wireless Body Area Network* Theodoros Mavroeidakos (University of Piraeus, Greece); Nikolaos Tsolis (University Of Piraeus, Greece); Dimitrios D. Vergados (University Of Piraeus, Greece) *Modelling an Intrusion Detection System Based on Adaptive Immunology* Vishwa Teja Alaparthy (University of South Florida, USA) *Non-Gradient Based PDF Approximation for Sensor Selection in Cognitive Sensor Network* Mohammad Reza Ghavidel Aghdam (University Of Tabriz, Iran); Reza Abdolee (California State University, Bakersfield, USA); Seyed Kamal Seyyedi Sahbari And Behzad Mozaffari Tazehkand (University Of Tabriz, Iran) *Assessing the Level of Physical Activity In The Workplace: A Case Study With Wearable Technology* Jose Manjarres, Pedro Narvaez, Maria Calle, Mauricio Pardo And Winston Percybrooks (Universidad Del Norte, Colombia) *In-Body Multi-Band Channel Modeling for Smart Health Applications* Theofilos Chrysikos And Dimitrios Tyrovolas (University Of Patras, Greece); Stavros Kotsopoulos (Wireless Telecommunications Laboratory, Greece)
7:30 am – 10:10 am	I-B Physical, MAC & Network Layers (I) *A Low Power IoT Medium Access Control for Receiver-Assigned CDMA* Eric Petrosky (Virginia Tech Hume Center, USA); Alan J Michaels (Virginia Tech; Hume Center for National Security and Technology, USA); Joseph M. Ernst (Virginia Tech, USA) *MAC and Routing Support Cognitive Radio Integrated Multi-hop Testbed* Gyu-min Lee, Cheol-Woong Lee and Byeong-hee Roh (Ajou University, Korea) *Factors Influencing the PAPR Performance of OFDM and MIMO-OFDM Systems: A Comparison Study* Tahreer Mahmood (Electrical/Computer Engineering; University of Arkansas at Little Rock USA, USA)

	MIMO Throughput of Wireless Access Networks Dean Thelen and Anthony Ng'oma (Corning Incorporated, USA); David Peters (Corning Incorporated) *Study on Orthogonalization Spacing of Antenna Arrays for Spatial Multiplexing in a millimeter-wave massive MIMO System* Chun-Hsiang Huang (NTT, Japan); Atsushi Ohta (NTT Network Innovation Laboratories, Japan); Kazuto Goto (Company & NTT, Japan); Yushi Shirato (NTT, Japan); Yutaka Imaizumi (Nippon Telegraph and Telephone Corporation, Japan); Naoki Kita (Nippon Telegraph and Telephone Corp., Japan) *An Improved Data Collection Algorithm for Wireless Sensor Networks* Vemula Manohar Reddy, Min Kyung An and Hyuk Cho (Sam Houston State University, USA) *Low-complex hybrid massive MIMO for downlink single-antenna multiuser wireless cellular networks* Homeyra Rahbari Kahjough (University of Tabriz, Iran); Reza Abdolee (California State University, Bakersfield, USA); Behzad Mozaffari tazehkand (University of Tabriz, Iran) Invited Presentation: *Development of a Graphical User Interface For RF and Satellite Communications* Ehsan Sheybani (University of South Florida, USA); Giti Javidi (University of South Florida Sarasota-Manatee, USA
10:10 am – 10:20 am	**Break**
10:20 am – 12:00 pm	II-A Wireless Business, Policy, and Applications Invited Presentation: *The Communications Ecosystem: Structure & Process* Steven Powell (California State Polytechnic University, Pomona, USA) Invited Presentation: *Fake news: The internet giants in a new post-gatekeeping role* Vassiliki Cossiavelou (Aegean University, Youth and Media Lab & Communications Counsellor at State, Belgium); Valentinos Tzekas (FightHoax, Greece) Invited Presentation: *Adaptive Computing at the Nodes of Fog and Cloud: Smart IoT* Ehsan Sheybani (University of South Florida, USA); Giti Javidi (University of South Florida Sarasota-Manatee, USA) *Internet of Things for a Smart Transportation System* Ahmed Awad and Seshadri Mohan (University of Arkansas at Little Rock, USA) Invited Presentation: *IS Curriculum Design based on Industry Demand: A Data Mining approach*

	Carlos Navarrete (California State Polytechnic University, Pomona, USA)
10:20 am – 12:00 pm	II-B Wireless Modeling, Algorithms, Simulations, and Analytics (I) *Accelerating High Throughput Cipher Processing on Supercomputing Platform* Hao Wang (National University of Defense Technology, P.R. China) *Fault Tolerance Model for Efficient Actor Recovery Paradigm in WSAN* Reem Mahjoub (University of Bridgeport, USA); Khaled M. Elleithy (School of Engineering, University of Bridgeport, USA) *Downlink Precoding for Massive UPA MIMO Systems Exploiting Virtual Channel Model Sparsity* Thomas Ketseoglou (California State Polytechnic University, Pomona, USA); Ender Ayanoglu (University of California, Irvine, USA) *PPHA-Popularity Prediction based High Data Availability for Multimedia Data Center* Kuo-Chi Fang, Husnu S. Narman, Ibrahim Hussein Mwinyi, and Wook-Sung Yoo (Marshall University, USA) *A Switching-Based and Delay-Aware Scheduling Algorithm for Cognitive Radio Networks* Mohamed Hassan, Omar Sweileh, Hasan Mir and Mahmoud H. Ismail Ibrahim (American University of Sharjah, United Arab Emirates)
12:00 pm – 1:00 pm	**Lunch** **Best Paper Awards Ceremony**
	IEEE *Xplore* Papers
1:00 pm – 3:20 pm	III-A Physical, MAC & Network Layers (II) *Modified CS-based Downlink Channel Estimation With Temporal Correlation in FDD Massive MIMO Systems* Xiaohui Bi, Jianing Zhao, Gang Wang, Yuting Lu, Lei Zhou and Duyang Li (Southeast University, P.R. China) *Research on SM-GFDM System and Its Low Complexity Signal Detection Algorithm* Shao Haining (Chongqing University of Posts and Telecommunications, P.R. China) *Device-to-Device Communications in the millimeter Wave Band: A Novel Distributed Mechanism* Niloofar Bahadori and Nima Namvar (North Carolina A&T State University, USA); Brian T Kelley (University of Texas at San Antonio, USA); Abdollah Homaifar (North Carolina A&T State University, USA) *Modeling Millimeter Wave Tropospheric Attenuations for UAS and Terrestrial*

	Aviation Communications Jinwen Liu and David W Matolak (University of South Carolina, USA) *31 GHz Path Loss Measurement and Modeling for Indoor/Outdoor Environment* Mohanad Mohsen and David W Matolak (University of South Carolina, USA) *An Enhanced Directional MAC Based on Round-Robin Scheduling and Mobility Beamforming Prediction in MANET* Vincenzo Inzillo (Università Della Calabria, Italy); Floriano De Rango (University of Calabria, Italy); Alfonso Ariza Quintana (University of Malaga, Spain) *An Efficient Wireless Access Point Selection Algorithm for Location Determination Based on RSSI Interval Overlap Degree Determination* Bang Wu, Zixiang Ma and Stefan Poslad (Queen Mary University of London, United Kingdom (Great Britain)); Wei Zhang (Wuhan University, P.R. China)
1:00 pm – 3:20 pm	III-B Wireless Modeling, Algorithms, Simulations, and Analytics (II) *Autoencoder-based Network Anomaly Detection* Zhaomin Chen, Chai Kiat Yeo, Bu Sung Lee and Chiew Tong Lau (Nanyang Technological University, Singapore) *Pareto Optimization for Uplink NOMA Power Control* Eren Balevi and Richard D. Gitlin (University of South Florida, USA) *Cooperative New Flow Handling Scheme for Wireless Multi-hop Software Defined Networks* Yan Sun and Bizhu Wang (Queen Mary University of London, United Kingdom (Great Britain)); Xiaodong Xu (Beijing University of Posts and Telecommunications & Wireless Technology Innovation Institute, P.R. China) *Automated Oscillation Detection and Correction of Fused Wearable Sensor Signals using Machine Learning* Seanglidet Yean, Bu Sung Lee, Chai Kiat Yeo and Zhaomin Chen (Nanyang Technological University, Singapore) *Detecting Traffic Anomaly in Wireless Networks, An Analytics Methodology* Ye Ouyang (Verizon, USA); Zhongyuan Li (Verizon Wireless, USA); Le Su, Wenyuan Lu, Zhenyi Lin and Wei Jiang (Verizon Wireless, USA) *Near-Instant Link Failure Recovery in 5G Wireless Fog-Based-Fronthaul Networks* Nabeel Sulieman, Eren Balevi and Richard D. Gitlin (University of South Florida, USA) *Theoretical Performance Evaluation of System Capacity in Multi-user MIMO THP with Ordering* Hirofumi Suganuma, Nobuhiro Hiruma and Fumiaki Maehara (Waseda University, Japan)
3:20 pm – 3:30	**Break**

pm	
3:30 pm – 7:00 pm	IV-A Wireless Business, Policy, and Applications (II) *User Throughput-Based Quality of Experience* Bhavesh Hiranandani and Mahasweta Sarkar (San Diego State University, USA); Albena Mihovska (Aarhus University, Denmark); Aniruddha Das (ViaSat Inc, USA) *Automated Class-based Compression for Real-Time Epileptic Seizure Detection* Alaa Awad Abdellatif and Amr Mohamed (Qatar University, Qatar); Carla-Fabiana Chiasserini (Politecnico di Torino, Italy) *Personalized Recommendation for Weibo Comic Users* Yan Sun (Queen Mary University of London, United Kingdom (Great Britain)); Haoran Lyu (Beijing University of Pose and Telecommunications, P.R. China); Xu Liu and Peng Xu (Beijing University of Posts and Telecommunications, P.R. China) *Predictive Self-Learning Content Recommendation System for Multimedia Contents* Husnu S Narman (Marshall University, USA) *Secure Multi-protocol Gateway for Internet of Things* Amiruddin Amiruddin (Universitas Indonesia & Sekolah Tinggi Sandi Negara, Indonesia); Anak Agung Putri Ratna (Faculty of Engineering, University of Indonesia, Indonesia); Riri Fitri Sari (Universitas Indonesia, Indonesia); Ruki Harwahyu (Universitas Indonesia & Sekolah Tinggi Sandi Negara, Indonesia) I*mproved OSIC Detector for Hybrid Space-Time Codes Based on Tree Search* Joaquin Cortez (Instituto Tecnologico de Sonora, Mexico); Miguel Bazdresch (Rochester Institute of Technology, USA); Erica Ruiz (Instituto Tecnológico de Sonora, Mexico); Ramón Palacio (Instituto Tecnologico de Sonora, Mexico) *A Highly Accurate Machine Learning Approach for Developing Wireless Sensor Network Middleware* Remah A Alshinina (University of Bridgeport, USA); Khaled M. Elleithy (School of Engineering, University of Bridgeport, USA) *On Improving Imputation Accuracy of LTE Spectrum Measurements Data* Aizaz U Chaudhry (Communications Research Center, Canada); Wei Li (Communications Research Centre, Canada); Amir Ali Basri and François Patenaude (Communications Research Centre Canada, Canada) *SAGE Algorithm Based MAP Channel Estimation for Multi-Cell Massive MIMO Systems* Senol Sancar (Istanbul Zaim University, Turkey)
3:30	IV-B Physical, MAC & Network Layers (III)

pm – 7:00 pm	*Adjustment of Firing Phase Changing Probability in Extended-Desync TDMA* Cheol-Woong Lee, Gyu-min Lee and Byeong-hee Roh (Ajou University, Korea) *Downlink Resource Allocation Scheme for VoLTE with Semi-Persistent Scheduling* Myasar Tabany (Postdoctoral Research Associate in Engineering & Wireless Communications Research Lab, United Kingdom (Great Britain)); Chris G Guy (The University of Reading, United Kingdom (Great Britain)) *A Software-Defined Networking framework for IoT based on 6LoWPAN* Fabian F Jurado Lasso (University of Melbourne, Australia); Ken Clarke and Ampalavanapillai Nirmalathas (The University of Melbourne, Australia) *A New Routing Protocol for UAV Relayed Tactical Mobile Ad Hoc Networks* Beom-Su Kim (GNU, Korea); Ki-Il Kim (Chungnam National University, Korea); Bongsoo Roh and Hyungseok Choi (Agency for Defense Development, Korea) *Mitigating Node Selfishness in Opportunistic Networks through Multi-layer Social-based Routing* Floriano De Rango (University of Calabria, Italy) *Measurement-based characterization of the 3.5 GHz channel for 5G-enabled IoT at complex industrial and office topologies* Theofilos Chrysikos, Panagiotis Georgakopoulos and Iliana Oikonomou (University of Patras,Laboratory, Greece) *Channel Access Mechanisms for Video Streaming over LTE-Unlicensed* Fatema Aseeri, Mohamed Hassan and Mahmoud H. Ismail Ibrahim (American University of Sharjah, United Arab Emirates) *Energy Efficient Sensor Selection Method in Cooperative Spectrum Sensing with Low-Complexity* Nastaran Vatankhah Barazande (University of Tabriz, Iran); Reza Abdolee (California State University, Bakersfield, USA); Behzad Mozaffari tazehkand and Hadi Seyedarabi (University of Tabriz, Iran) *A VHO Scheme for Supporting Healthcare Services in 5G Vehicular Cloud Computing Systems* Dimitrios D. Vergados (University of Piraeus, Greece); Emmanouil Skondras (UNIPI, Greece); Angelos Michalas (Technological Education Institute of Western Macedonia, Greece) *Simulation-based Optimization for Reconfiguration of Mobile Wireless Sensor Network* Hyoshin Park and James Headen (North Carolina A&T State University, USA

WTS 2018 Poster Papers
Thursday, April 19

Applicability of Human Immune System to Intrusion Detection in WSN's
Vishwa Alaparthy and Salvatore D. Morgera (University of South Florida, USA)

M2M Communications for Ubiquitous Smart Home System Using Android Application
Wael Alsafery and Balraddin Alturki (Leicester University, UK); Kamal Jambi (King Abdulaziz University, Saudi Arabia)

Speaker Biographies

Dr. Huseyin Arslan (*IEEE Fellow*) has received his BS degree from Middle East Technical University (METU), Ankara, Turkey in 1992; MS and Ph.D. degrees in 1994 and 1998 from Southern Methodist University (SMU), Dallas, TX. USA. From January 1998 to August 2002, he was with the research group of Ericsson Inc., NC, USA, where he was involved with several projects related to 2G and 3G wireless communication systems. Since August 2002, he has been with the Electrical Engineering Dept. of University of South Florida, Tampa, FL, USA, where he is a Professor. In December 2013, he joined Istanbul Medipol University to found the Engineering College, where he has worked as the Dean of the School of Engineering and Natural Sciences. He has also served as the director of the Graduate School of Engineering and Natural Sciences at the same university. In addition, he has worked as a part-time consultant for various companies and institutions including Anritsu Company, Savronik Inc., and The Scientific and Technological Research Council of Turkey. Dr. Arslan's research interests are related to advanced signal processing techniques at the physical and medium access layers, with cross-layer design for networking adaptivity and Quality of Service (QoS) control. He is interested in many forms of wireless technologies including cellular radio, wireless PAN/LAN/MANs, fixed wireless access, aeronautical networks, underwater networks, in vivo networks, and wireless sensors networks. His current research interests are on 5G and beyond, physical layer security, interference management (avoidance, awareness, and cancellation), cognitive radio, small cells, powerline communications, smart grid, UWB, multicarrier wireless technologies, dynamic spectrum access, co-existence issues on heterogeneous networks, aeronautical (High Altitude Platform) communications, in vivo channel modeling and system design, and underwater acoustic communications. He has served as technical program committee chair, technical program committee member, session and symposium organizer, and workshop chair in several IEEE

conferences. He is currently a member of the editorial board for the IEEE Surveys and Tutorials and the Sensors Journal. He has also served as a member of the editorial board for the IEEE Transactions on Communications, the IEEE Transactions on Cognitive Communications and Networking (TCCN), the Elsevier Physical Communication Journal, the Hindawi Journal of Electrical and Computer Engineering, and Wiley Wireless Communication and Mobile Computing Journal.

Prof. Daniel W. Bliss (bliss.asu.edu) is the Director of Arizona State University's Center for Wireless Information Systems and Computational Architectures (wisca.asu.edu). He is an Associate Professor in the School of Electrical, Computer, and Energy Engineering at ASU and a Fellow of the IEEE. Dan received his Ph.D. and M.S. in Physics from the University of California at San Diego (1997 and 1995), and his B.S. in Electrical Engineering from Arizona State University (1989). His current research focuses on advanced systems in the areas of concepts radio, radar, and medical monitoring. To achieve these goals, he develops and employs information, detection, and estimation theory, and algorithm development, including machine learning. Dan has been the principal investigator on numerous programs including sponsored programs with DARPA, ONR, Google, Airbus, and others. He is responsible for foundational work in electronic protection, adaptive multiple-input multiple-output (MIMO) communications, MIMO radar, distributed-coherent systems, and RF convergence. He has also made significant contributions to medical and physiological analytics. Before moving to ASU, Dan was a Senior Member of the Technical Staff at MIT Lincoln Laboratory (1997-2012). Between his undergraduate and graduate degrees, Dan was employed by General Dynamics (1989-1993), where he designed avionics for the Atlas-Centaur launch vehicle, and performed magnetic field optimization for high-energy particle-accelerator superconducting magnets. His doctoral work (1993-1997) was in the area of high-energy particle physics and lattice-gauge-theory calculations. He has published over 100 technical articles and conference papers, and he received the Best Lecture Award for his 2008 Tri-Service Radar Conference paper that discussed MIMO radar. He has published a textbook with Cambridge University Press, "Adaptive Wireless Communications: MIMO Channels and Networks," 2013. Dan is a member of the IEEE AES Radar Systems Panel.

Dr. Gregory H. Carlton is a Professor of Computer Information Systems at California State Polytechnic University, Pomona where he offers courses in Digital Forensics, Security and Privacy in Information Systems, and CyberLaw. In addition to his academic research and publications in Digital Forensics, he has provided expert testimony in court, he is an

EnCase Certified Examiner, and he is a member of the High Technology Crime Investigation Association. He has led a CyberCrime training program through the United Nations Office of Drugs and Crime directed to law enforcement and the judiciary of third world nations at the national level. Dr. Carlton also has more than 20 years of business experience working for companies such as IBM, Hewlett-Packard, Alcatel, and Superior Telecommunications. He earned his Ph.D. and MBA at the University of Hawaii.

Dr. Aravind Chamarti is currently a commercial technology leader at Corning Optical Communications Wireless Inc. He has been with Corning since 2006 where he has held various positions in research and development and product management for distributed antenna systems and applications. He has pioneered several first to market products and is currently a thought leader on applications of IoT and in-building location. He received a PhD from Louisiana University and holds several US patents.

Dr. François Cosquer is CTO Security for Nokia Software business group. He has also served as Head of Solutions Security for the Alcatel-Lucent Corporate Solutions organization and as CTO Security and Technology Strategist for the Alcatel-Lucent Enterprise Business Group. Over the past 20 years, he has held senior positions with research institutions, equipment vendors and telecommunications operators. He draws on extensive experience in security architecture, networking, operating systems, middleware, and multimedia applications. He has been speaker, panelist, and chair at key industry events and conferences. François graduated in Electronics and Computing and holds an MSc in Computer Science and a Ph.D. in Computer Engineering. He currently serves as Adjunct Professor at the Faculty of Engineering and Computer Science, University of Concordia, Montreal.

Dr. Vassiliki Cossiavelou, Ph.D., is currently Scientific Policy Officer in the European Commission while she is also Senior Communication Adviser at State and Associate Researcher of Youth and Media Lab in the Department of Cultural Technology and Communication of the University of the Aegean, Greece. Dr. Cossiavelou's research agenda has been extensive, ranging from EU policies on media communication, to media gatekeeping, sports broadcasting, mega-events communication, social media strategies, branding. Her current research interests include EU and USA regulations on media, social media strategies, privacy and security issues, business models in social and traditional media industries, big data, media archives. Dr. Cossiavelou's papers have appeared in proceedings of

int'l conferences such as IEEE, ACM, INFORMS, WTS, WSKS, ICTSMA, among others. Her research papers appear in Journals such as the IJMNT and IJITN. She is a member of several EU and UN communication initiatives as well as International media and telecommunications professionals' associations. Her journal papers have external references in multidisciplinary journals such as Journal of Broadcasting & Electronic Media, International Journal of Sport Communication, among others and in grey bibliography of Purdue University, National University of Athens, University of Macedonia, etc. She has been regularly invited in European and American universities as lecturer and keynote speaker in media and telecommunications conferences. Outside academia, she has been assigned to two diplomatic posts as Communication Officer in Greek Embassy of Greece in China and in the Permanent Representation of Greece to the EU, in Belgium, as well as an External Expert in EACEA for EU-funded programs and as Coordinator Assistant in EC for the Radio Spectrum Comitology Committee. She may be 'virtually' reached at her LinkedIn account https://www.linkedin.com/in/vassilikicossiavelou

Dan Gillmor, an internationally recognized author and leader in new media and citizen-based journalism, teaches digital media literacy and works to help bring a culture of entrepreneurship into journalism education.

Gillmor, a 1981 graduate of the University of Vermont, started his journalism career at the Valley Voice in Middlebury, Vt., before moving to the Times Argus in Barre-Montpelier, Vt. In 1984 he joined the Kansas City Times, where he became a regional correspondent, covering politics and the rural economy. During the 1986-87 academic year, he was fellow at the University of Michigan in what is now called the Knight-Wallace Journalism Fellows program.

In 1988 Gillmor moved to the Detroit Free Press, where he covered transportation, regional affairs and technology. He was an early practitioner there of computer-assisted reporting, and became one of the first journalists at a traditional media company to use the Internet as part of his work.

Gillmor joined the San Jose Mercury News in 1994, writing a widely read column and blog that chronicled the dot-com revolution in Silicon Valley, and technology's wider impact on policy and society. His blog was one of the first by a journalist for a mainstream journalism organization.

In 2004 he published “We the Media: Grassroots Journalism by the People, for the People,” a book on citizen journalism that has been published in many languages, most recently Korean and Arabic. The book is widely recognized as the first to explain how the collision of journalism and technology has democratized the creation of and access to media, and why it matters. Gillmor's second book, "Mediactive" (2009), is about digital media literacy, aiming to help people become active users – as consumers and creators – of modern media.

In 2005 Gillmor left the Mercury News to work on grassroots media projects, including Bayosphere, a for-profit citizen-media effort that did not achieve critical mass and was eventually sold. He counts that failure as by far the most valuable learning experience of his career.

Subsequently, he has been an early-stage investor in several new media startups including Silicon Valley-based Wikia Inc., founded by Wikipedia founder Jimmy Wales. Gillmor is co-founder of Helsinki-based Dopplr, a travel-related startup that was acquired by Nokia in September 2009. He also co-founded and continues to advise the Knight-funded Digital Media Law Project.

He also is an advisor to several technology and media-related ventures.

Gillmor continues to write in blogs and other media, including a weekly column for the Guardian. He speaks frequently at conferences and major universities around the world on media and technology topics. For that purpose, he has traveled to Europe, Asia, Africa and South America, including several trips sponsored by the U.S. State Department.

A member of Investigative Reporters & Editors, Gillmor serves on boards of directors or advisory boards for several media-related nonprofits including the California First Amendment Coalition, the Knight New Media Center at USC and UC-Berkeley, Global Voices Online and NewsTrust. Before starting his journalism career, Gillmor was a professional musician.

Dr. Larry Head is a Professor of Systems and Industrial Engineering and Director of the Arizona Transportation Research Institute at the University of Arizona. He has over 25 years of systems engineering experience related to adaptive traffic signal control, signal priority, and connected and automated vehicle systems. He serves on the Arizona Governor’s Task Force for Self -Driving Vehicles, is a member of the Transportation Research Board (TRB) Freeway Operations Committee and Intelligent

Transportation Systems Committees, and a member of the SAE DSRC Technical Committee. He is an Associate Editor of Transportation Research – Part C. He is a member of TRB, SAE, INFORMS, IISE, and IEEE.

Dr. Markus Hofmann joined Bell Labs in 1998, transitioning from researcher, to project manager, to Head of Bell Labs Research - Alcatel-Lucent's research organization that is globally recognized for inventions that shaped the world of telecommunications and technology including the transistor, the laser, DSL, UNIX, C and C++, Solar Cells and MIMO. Seven Nobel Prizes have been awarded for work completed at Bell Laboratories. Dr. Hofmann has overseen research in multimedia communications, optics, wireless, cloud, Internet, content networking and more. Not to mention he is renowned for his pioneering work on reliable multicasting over the Internet and for defining and shaping fundamental principles of content networking. In his current role as Head of Application Platforms & Software Systems Research, he created a new global team of diverse researchers to develop disruptive solutions for the most persistent software, systems, and data analytics problems. Under his leadership he is inventing, building, and delivering innovative software components into the market.

Dr. Hofmann has published over 60 journal and conference papers and given invited talks as well as courses all over the world. He has been granted 14 U.S. patents, with many more patent applications pending. Dr. Hofmann has been very active in several professional organizations, and the IEEE Communications Society (ComSoc), in particular. He has served as Chair of the Internet Technical Committee (ITC), a joint committee of the Internet Society and the IEEE Communications Society. He has also served as the Chair of the Open Pluggable Edge Services (OPES) Working Group in the Internet Engineering Task Force (IETF), on the Editorial Board of the Computer Communications Journal and on the Editorial Board of the IEEE/ACM Transactions on Networking. He has been involved in organizing a number of major international conferences and events. These include serving as the Technical Program Chair of the IEEE Globecom Symposium on Global Internet, the Network Group Communication (NGC), and the 1999 GI Multicast Workshop. He has been on the Advisory Board of the 2001 Content Distribution Networking (CDN) conference and served as guest editor of a issue of the Computer Networks Journal. Dr. Hofmann has been on the program committees of various IEEE and ACM-sponsored conferences and is an alumnus of the 2004 Frontiers of Engineering, National Academy of Engineers (NAE). Between 1998 and 2002, he was a national representative of Germany on

the Cost 264 Management Committee, a project within the European research framework.

He received his Ph.D. with honors in Computer Engineering from University of Karlsruhe, Germany, in 1998 and joined Bell Labs Research the same year. For the spring 2005, spring 2006, and spring 2007 semesters, Dr. Hofmann also accepted a position as adjunct professor at Columbia University in New York, USA, teaching a graduate course on Content Networking. Before joining Bell Labs in May 1998, he worked as a Senior Researcher in the High Performance Networking Group at University of Karlsruhe, Germany, where he initiated and led several projects with industry partners in multiple European countries.

Dr. Hofmann has been awarded several prestigious awards. His Ph.D. thesis won the 1998 GI/KuVS Doctoral Dissertation Award for the best Ph.D. thesis in Germany in the area of Distributed Systems and Telecommunications, and the 1998 FZI Doctoral Dissertation Award for best Ph.D. thesis in Computer Science at University of Karlsruhe. He received the Bell Labs Teamwork Award several times and was a key leader of the team that won the 2006 Lucent Chairman award. In 2013, Dr. Hofmann and his colleagues were awarded the Thomas Edison Patent Award. For more information, see http://www.mhof.com/.

Dr. Habib Riazi has been a contributor to the telecom industry for more than 30 years. He has been the RF and Systems Engineering Director at Corning Optical Communications Wireless Ltd, a major manufacturer of active Distributed Antenna System (DAS). His previous tenure includes positions at both wireless service providers and equipment manufacturers. Prior to Corning, Habib was the Technology Strategist at Nextel, Sprint, and Clearwire, where he was responsible for assessing and recommending Radio Access Technology and products for network deployment. Prior to Nextel, he led the team for system design and simulation of the Satellite Digital Audio Receiver, now a commercially available product, at Bell Labs Advanced Technologies. Prior to Bell Labs, Habib served as the Radio Access Network Manager for Verizon for one of the first CDMA commercial network deployments. Habib did doctoral studies in Electrical Engineering at the George Washington University in Washington DC. He is a life senior member of IEEE ComSoc, a registered Professional Engineer in the state of Virginia, has served on Virginia State University Industrial Advisory Board, and holds a number of US and EU patents.

Erik Rolland, Ph.D., is Dean of the College of Business Administration at Cal Poly Pomona. Since graduating with his Ph.D. in Decision Sciences &

Information Systems from the Fisher College of Business at the Ohio State University in 1991, he has held faculty appointments at the University of California (Merced), the Anderson Graduate School of Management at University of California (Riverside), the Fisher School of Business at the Ohio State University, and has served as visiting distinguished professor with the Antai School of Management & Economics at the Shanghai Jiaotong University. His prior administrative positions include Interim Dean of the School of Engineering (UC Merced), Assistant to the Provost (UC Merced), Director of the University of California's Heckmann International Center of Entrepreneurial Management (UC Riverside), and Associate Dean for the Anderson Graduate School of Management (UC Riverside).

Erik's research embodies a broad range of management areas, electronic commerce, service science, and modeling of complex technology and management problems. He has published more than 100 articles in academic journals and texts on information systems, business analytics, technology management, operations research, leadership, and strategy. He is the recipient of the 2009 American Institute for Certified Public Accountant's (AICPA) Management Accounting Research Fellowship for his work on Enterprise Risk Management, and the 2011 IBM Faculty Award for his work on understanding patent value.

Dr. Raghu Santanam is McCord Chair in Business, Professor and Department Chair, Department of Information Systems at Arizona State University. He joined the W. P. Carey School of Business as an assistant professor of information systems in 1998.

Santanam's research has focused on the impacts of technology and technology strategies on businesses, society, and consumers. His research areas of interest include, health information technology, digital platforms and markets, services and business process design, and information assurance. His research on digital platforms has explored emerging business strategies, consumer preferences, and trends in software markets and platforms. Santanam is an active researcher in the health information technology area and has published scholarly articles on electronic medical records impacts on hospitals, personal health records adoption by consumers, and technology-based decision support for public health. His work has been published in leading peer-reviewed journals, including *Management Science, Information Systems Research, Journal of Management Information Systems, Journal of the Association for Information Systems, and Decision Support Systems.*

Before joining W. P. Carey, Santanam was an instructor of management at the State University of New York at Buffalo. He received his bachelor's degree in electronics and communications from the National Institute of Engineering, his master's degree in industrial management from the Indian Institute of Technology, and a second master's degree and PhD from the State University of New York at Buffalo.

He currently serves on the editorial boards of premier journals and has served as an advisory editor of the Elsevier series on *Handbooks in Information Systems*. He has been commended for his contributions to academia, most recently winning the 2012 Outstanding Teaching Award – MBA and Graduate Business. He was named chair of the Department of Information Systems in 2015.

Dr. Durga Satapathy currently serves as Director of Technology Innovation & Architecture at Sprint where he is responsible for RF Technology Strategy & Architecture for radio networks systems (LTE & 5G) and support of related standards, regulatory and global ecosystem activities. Dr. Satapathy has over 20 years' experience with Sprint and Clearwire combined, leading access and backhaul research and architecture development, orchestrating key technology proof of concepts/demonstrations, vendor solutions development, technical contract negotiation, and technology/vendor selection. Dr. Satapathy holds a Ph.D. in Electrical and Computer Engineering from Carnegie Mellon University, Pittsburgh. His Ph.D. thesis addressed spectrum sharing and specifically resource utilization of unlicensed spectrum with spectrum etiquettes. He is an IEEE Senior Member and his portfolio includes 59 USPTO patent awards and publications in IEEE International Conference on Communications, IEEE Vehicular Technology Conference, and IEEE Globecom. He has served as Chairman, IEEE 802.16 WiMAX Standards Task Group 4, and participated in 3GPP activities for LTE standards development. His wireless communications ecosystem activities include serving as Industry Consortium Member for Platforms for Advanced Wireless Research (PAWR) project, Industry Forum Exhibitions Program Chair for ICC2018, Panel Reviewer for NSF projects, Wireless Advisory Board Member of Auburn University Wireless Engineering Research and Education Center, Industry Community Board Member for IEEE COMSOC, NYU Wireless Industry Affiliates Board Member, etc. Further details are available at https://www.linkedin.com/in/durgasatapathy

Dr. J. P. Shim is a faculty of Computer Information Systems and Executive Director of KABC at Robinson College of Business at Georgia State University. Before joining at GSU in 2011 as a faculty, he was

professor of BIS, Larry and Tonya Favreau Notable Scholar, John Grisham Professor, and IBSP Director at Mississippi State University. During the past twenty-seven years at MSU, he was a seventeen-time recipient of outstanding faculty awards. He received his Ph.D from University of Nebraska-Lincoln and completed Harvard Business School's Executive Education Program. He has published several books and over 100 papers, such as *Journal of AIS, Communications of the ACM, Journal of Strategic Information Systems, European Journal of Information Systems, Decision Support Systems, Information & Management, Interfaces, Journal of Information Technology, Sloan Management Review, Journal of Operational Research Society, Computers & Operations Research, Omega, Academy of Management Proceedings,* and *ICIS Proceedings*. He served on 2013 AMCIS Program Co-chair and was the principal investigator on several National Science Foundation grants and has received numerous funding from organizations He has been interviewed by the media (CBS TV, AP, The Clarion-Ledger, AJC, Global Atlanta) and worked as a consultant for Booz Allen, U.S. EPA, and Kia Motors Manufacturing Georgia.

Dr. John E. Smee is a Vice President of Engineering at Qualcomm Technologies Inc., and is currently a 5G project engineering lead in Qualcomm's wireless research and development group. His work involves taking advanced system designs and signal processing techniques from theory through design, simulation, standardization, implementation, and productization. John has worked as an algorithm designer, systems lead, and project lead on a range of products including 3G EVDO, 4G LTE, and IEEE 802.11. He was chosen to participate in the National Academy of Engineering Frontiers of Engineering program and is a recipient of the Qualcomm Distinguished Contributor Award for Project Leadership. He received his Ph.D. in electrical engineering from Princeton University, and also holds an M.A. from Princeton and an M.Sc. and B.Sc. from Queen's University.

Dr. Rob van den Dam is the Global Telecommunications Industry Leader at the IBM Institute for Business Value. He is responsible for developing and deploying strategic thought leadership in telecommunications and as such contributor to IBM's global telecom strategy. In this role he develops future agendas, industry outlooks and business value realization studies. He has 20 years' experience in the telecom industry and has worked in a range of advisory and implementation roles for major telecommunications, media and government organizations.

Prior to joining IBM he worked for Data Sciences where he was Senior

Principal and one of the founders of Data Sciences' telecommunications practice. He started his career 30 years ago at the National Aerospace Industry where he worked in both national and international projects. Rob graduated at the Delft University in Aerospace Engineering (with honours), where he received a PhD.

Recent work includes future scenario planning, big data, Cloud, social business, and Internet of Things. Rob periodically presents or participates in panel sessions at major industry conferences, such as World Future Trends Summit, ITU World, GSMA Mobile Asia Conference, Total Telecom World, World Telecom Council, CommunicAsia, Broadband World Forum, and Asian Carriers' Conference. He has published multiple articles in, amongst others, Total Telecom Magazine, Telecom Asia magazine, European Communications, Mobile Europe, Annual Review of Communications and Journal of Telecommunications Management.

Dr. Qing-An Zeng is an Associate Professor of Computer Systems Technology and Director of the Wireless and Mobile Networking Laboratory at North Carolina A&T State University. He received his MS and PhD degrees both in electrical engineering from Shizuoka University. He has over 30 years of networking research experience in both the industry and academy. He was a representative of NEC in Japan and worked as a member of 3GPP Layer 2 Task Working Group and Layer 3 Task Working Group until 3GPP Release 99 issued. He currently holds several patents in the handoff scheme and security algorithm of wireless and mobile systems. He has published more than 140 publications including books, book chapters, journal articles, and conference proceedings papers. He is the co-author of a book entitled "Introduction to Wireless and Mobile Systems, 4th edition" published by Cengage Learning in 2014. He is a senior member of IEEE.

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