2018 IEEE Vehicular Networking Conference (VNC 2018)

Taipei, Taiwan
5-7 December 2018

IEEE Catalog Number: CFP18VNC-POD
ISBN: 978-1-5386-9429-9

****** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP18VNC-POD
ISBN (Print-On-Demand):	978-1-5386-9429-9
ISBN (Online):	978-1-5386-9428-2
ISSN:	2157-9857

Additional 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
Web: www.proceedings.com

Wednesday, December 5

Wednesday, December 5 9:00 - 9:30

Opening

Wednesday, December 5 9:30 - 10:30

Keynote 1: Networked UAVs on a Mission

Prof. Edward Knightly

Abstract. Today, UAVs are equipped with a host of sensors that aid in navigation, including gyroscopes, lidar, and GPS. UAVs can be further equipped with sensors that can aid in realizing missions such as search and rescue or finding and tracking a mobile target. Such sensors include software defined radios, environmental and gas sensors, and video cameras. In this talk, I will describe how the fusion of advanced capabilities in sensing, communication, and machine learning will enable networks of UAVs to accomplish previously impossible tasks. I will describe the state of the art and research challenges while drawing on recent experiences from experimental systems.

Bio. Edward Knightly is the Sheafor-Lindsay Professor and Department Chair of Electrical and Computer Engineering at Rice University in Houston, Texas. He received his Ph.D. and M.S. from the University of California at Berkeley and his B.S. from Auburn University. He is an ACM Fellow, an IEEE Fellow, and a Sloan Fellow. He received the Dynamic Spectrum Alliance Award for Research on New Opportunities for Dynamic Spectrum Access and the National Science Foundation CAREER Award. He received best paper awards from ACM MobiCom, ACM MobiHoc, IEEE Communications and Network Security (CNS), IEEE SECON (twice), and the IEEE Workshop on Cognitive Radio Architectures for Broadband. He served as general chair or technical chair for ACM MobiHoc, ACM MobiSys, IEEE INFOCOM, and IEEE SECON. He serves as an editor-at-large for IEEE/ACM Transactions on Networking and serves on the IMDEA Networks Scientific Council. In 2012, he served as an expert witness for the Apple v. Samsung patent trial of the century.

Professor Knightly's research interests are design and in-the-field demonstration of new mobile and wireless networks and systems, including mission-driven autonomous drone networks, wireless security, and networked spectrum access in UHF, 60 GHz, THz, and visible light. He leads the Rice Networks Group. The group's projects include deployment, operation, and management of a large-scale urban wireless network in a Houston under-resourced community. This network, Technology For All (TFA) Wireless, has served over 4,000 users in several square kilometers and employs custom-built programmable and observable access points. See a video from the 2016 White House announcement of the Advanced Wireless Research Initiative. The network was the first to provide residential access in frequencies spanning from unused UHF TV bands to legacy Wi-Fi bands (500 MHz to 5 GHz). His group developed the first multi-user beam-forming WLAN system that demonstrates a key performance feature now provided by Wi-Fi since the 802.11ac ammendment.

Wednesday, December 5 10:30 - 10:45

Coffee Break

Wednesday, December 5 10:45 - 12:10

S1: Communications

Chair: Falko Dressler (Paderborn University, Germany)

Power Budget for Wide Area Ambient backscattering Communications

Ritayan Biswas (Tampere University of Technology, Finland); Joonas Säe (Tampere University, Finland); Jukka Lempiäinen (Tampere University of Technology, Finland)

Time-Domain Broadband 60 GHz Channel Sounder for Vehicle-to-Vehicle Channel Measurement

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); Tomas Mikulasek and Jiri Blumenstein (Brno University of Technology, Czech Republic); Erich Zöchmann and Herbert Groll (TU Wien, Austria); Christoph F Mecklenbräuker (Vienna University of Technology, Austria); Markus Hofer (AIT Austrian Institute of Technology, Austria); David Löschenbrand (AIT Austrian Institute of Technology GmbH, Austria); Laura Bernadó (Austrian Institute of Technology, Austria); Thomas Zemen (AIT Austrian Institute of Technology GmbH, Austria); Seun Sangodoyin and Andreas Molisch (University of Southern California, USA)

OFDM Pilot-Based Radar for Joint Vehicular Communication and Radar Systems

Ceyhun D Ozkaptan and Eylem Ekici (The Ohio State University, USA); Onur Altintas and Chang-Heng Wang (Toyota InfoTechnology Center, USA, Inc., USA)

Realizing Collective Perception in the Artery Simulation Framework

Keno Garlichs, Martin Wegner and Lars C Wolf (Technische Universität Braunschweig, Germany)

Evaluation of IEEE 802.11af Compliant Devices for Vehicle to Infrastructure Communications in Suburban Environment

Jeric G. Brioso and Alberto Bañacia (University of San Carlos, Philippines); Hirokazu Sawada, Kentaro Ishizu and Kazuo Ibuka (National Institute of Information and Communications Technology, Japan); Takeshi Matsumura (Kyoto University & National Institute of Information and Communications Technology (NICT), Japan); Fumihide Kojima (National Institute of Information and Communications Technology, Japan)

Wednesday, December 5 12:10 - 13:20

Lunch

Wednesday, December 5 13:20 - 14:50

App Contest

Hand-free Gesture Recognition for Vehicle Infotainment System Control

Qi Ye, Lanqing Yang and Guangtao Xue (Shanghai Jiao Tong University, P.R. China)

Using Mobile Phones to Crowd-source User Flow Data for Assessing Bike Sharing Site Suitability

Shan Jean WU, Luo Wei Lun, Ju-Ying Chan, LiChuan Yang and Irene Wang (National Taiwan University, Taiwan); Hung-Yeh Lin (National Taiwan University IoX Center, Taiwan)

A Smartphone Platform for Pedestrian Safety

Stephen Xia and Daniel Godoy (Columbia University, USA); Bashima Islam, Md Tamzeed Islam and Shahriar Nirjon (University of North Carolina at Chapel Hill, USA); Peter Kinget and Xiaofan Jiang (Columbia University, USA)

SmartWheelTag: Flexible and Battery-less User Interface for Drivers

Yuhui Sun (Shanghai Jiao Tong University, P.R. China); Yongzhao Zhang (Shanghai Jiao Tong University & School of Electronic, P.R. China); Guangtao Xue (Shanghai Jiao Tong University, P.R. China)

TaxSeeMe: A Taxi Administering System for the Visually Impaired

S M Towhidul Islam, Bezawit Woldegebriel and Ashwin Ashok (Georgia State University, USA)

Wednesday, December 5 14:50 - 15:55

S2: AI and cloud technologies for V2X

Chair: Chung-Wei Lin (National Taiwan University, Taiwan)

Reinforcement Learning Scheduler for Vehicle-to-Vehicle Communications Outside Coverage

Taylan Sahin (Munich Research Center, Huawei Technologies Duesseldorf GmbH & Technische Universität Berlin, Germany); Ramin Khalili (Huawei Technologies, Germany); Mate Boban (Huawei German Research Center, Germany); Adam Wolisz (TUB, Germany)

Applying Deep Recurrent Neural Network to Predict Vehicle Mobility

Wei Liu and Yozo Shoji (National Institute of Information and Communications Technology, Japan)

Cloud-based Vehicle Functions: Motivation, Use-cases and Classification

Farzaneh Milani (Robert Bosch GmbH, Germany); Christian Beidl (Technical University of Darmstadt, Germany)

Content Replication in Vehicular Micro Cloud-based Data Storage: A Mobility-Aware Approach

Takamasa Higuchi (Toyota InfoTechnology Center USA, USA); Gurjashan Singh Pannu and Falko Dressler (Paderborn University, Germany); Onur Altintas (Toyota InfoTechnology Center, USA, Inc., USA)

Wednesday, December 5 15:55 - 16:15

Coffee Break

Wednesday, December 5 16:15 - 18:00

S3: Security

Chair: Hsiao Ying Lin (Shield Lab, Huawei International, Singapore)

Bionyms: Driver-centric Message Authentication using Biometric Measurements

Marc Roeschlin, Christian Vaas, Kasper Bonne Rasmussen and Ivan Martinovic (University of Oxford, United Kingdom (Great Britain))

Pseudonym Certificate Validations under Heavy Vehicular Traffic Loads

Chaitanya Yavvari (GMU, USA); Duminda Wijesekera and Santos Jha (George Mason University, USA)

Guarding the Guards: Accountable Authorities in VANETs

Joakim Brorsson (Lund University & Combitech AB, Sweden); Paul Stankovski and Martin Hell (Lund University, Sweden)

Mitigating Position Falsification Attacks in Vehicular Platooning

Felipe Boeira and Mikael Asplund (Linköping University, Sweden); Marinho P. Barcellos (Federal University of Rio Grande do Sul, Brazil)

Thursday, December 6

Thursday, December 6 8:30 - 9:30

S4: Privacy

Chair: Hsu-Chun Hsiao (National Taiwan University, Taiwan)

An Efficient Privacy-Preserving Outsourced Geofencing Service Using Bloom Filter

Christoph Bösch (Ulm University, Germany)

Nowhere to hide? Mix-Zones for Private Pseudonym Change using Chaff Vehicles

Christian Vaas (University of Oxford, United Kingdom (Great Britain)); Mohammad Khodaei and Panagiotis Papadimitratos (KTH, Sweden); Ivan Martinovic (University of Oxford, United Kingdom (Great Britain))

iRide: A Privacy-Preserving Architecture for Self-Driving Cabs Service

Ala'a Al-Momani and Frank Kargl (Ulm University, Germany); Robert K Schmidt (Denso Automotive Dtld. GmbH, Germany); Christoph Bösch (Ulm University, Germany)

Thursday, December 6 9:30 - 10:30

Keynote 2: Towards Building Internet of Vehicles

Dr. Fan Bai

Abstract. Recent developments in the automotive industry point to a new emerging domain of connected vehicles, in which vehicles equipped with wireless radios can communicate a wide range of information to each other as well as the Internet infrastructure, including traffic updates, safety notification and infotainment content. The first half of the talk will focus on how to develop a hybrid network architecture for vehicular networks which combines both the existing cellular infrastructure as well as new vehicle-to-vehicle (V2V) communication capabilities. Compared to either a purely centralized cellular-based approach or a purely distributed V2V approach, this hybrid network architecture will improve cost, capacity and robustness. The second half of the talk will elaborate one particular example of vehicular applications - collaborative automotive sensing, which could be supported by vehicular networks. In collaborative automotive sensing, hundreds of embedded automotive sensors in each vehicle, coupled with online maps and other databases as well as crowd-sourced information from other cars, can jointly assess vehicular surrounding environments and driving contexts, and be used to enhance system performance and provide assistance to vehicle drivers and passengers.

Bio. Dr. Fan Bai is a Staff Researcher in the Electrical & Control Systems Lab., Research & Development and Planning, General Motors Corporation, since Sep., 2005. Before joining General Motors research lab, he received the B.S. degree in automation engineering from Tsinghua University, Beijing, China, in 1999, and the M.S.E.E. and Ph.D. degrees in electrical engineering, from University of Southern California, Los Angeles, in 2005.

His current research is focused on the discovery of fundamental principles and the analysis and design of protocols/systems for next-generation vehicular networks, for safety, telematics and infotainment applications. He published about 100 research papers in top-quality conferences and journals, and received more than 11,000 citations (according to Google Scholar). He also has more than 120 patents granted or pending.

He received Charles L. McCuen Special Achievement Award from General Motors Corporation in recognition of his accomplishment in area of vehicle-to-vehicle communications for drive assistance & safety. He was featured as "ITS People" in 2014 by IEEE ITS Magazine for his technical contributions to vehicular networks and intelligent transportation systems. He serves as Technical Program Co-Chairs for IEEE WiVec 2007, IEEE MoVeNet 2008, ACM VANET 2011 and ACM VANET 2012, among other leading roles in academic and industry technical conferences. He is an Associate Editor of IEEE Transaction on Vehicular Technology and IEEE Transaction on Mobile Computing, and he also serves as guest editors for IEEE Wireless Communication Magazine, IEEE Vehicular Technology Magazine and Elsevier AdHoc Networks Journal.

He is a Fellow and Distinguished Lecturer of IEEE.

Thursday, December 6 10:30 - 10:45

Coffee Break

Thursday, December 6 10:45 - 12:10

S5: Misbehavior and attack prevention

Chair: Susumu Ishihara (Shizuoka University, Japan)

The Unified Butterfly Effect: Efficient Security Credential Management System for Vehicular Communications

Marcos A. Simplicio Jr. and Eduardo Cominetti (University of São Paulo, Brazil); Harsh Kupwade Patil (LG Electronics, USA); Jefferson Ricardini and Marcos Silva (University of São Paulo, Brazil)

Falsified Data Attack on Backpressure-based Traffic Signal Control Algorithms

Chia-Cheng Yen and Dipak Ghosal (University of California, Davis, USA); Michael Zhang (UCD, USA); Chen-Nee Chuah (University of California, Davis, USA); Hao Chen (UC Davis, USA)

ProSEV: Proxy-Based Secure and Efficient Vehicular Communication

Mohammad Hamad (Technical University of Braunschweig & IDA, Germany); Mustafa R. Agha (Technische Universität Braunschweig, Germany); Vassilis Prevelakis (Technische Universität Braunschweig, Greece)

Misbehavior Reporting Protocol for C-ITS

Joseph Kamel (IRT SystemX & Télécom ParisTech, France); Ines Ben Jemaa (IRT-SystemX, France); Arnaud Kaiser (Institut de Recherche Technologique SystemX, France); Pascal Urien (Télécom ParisTech, France)

Misbehavior detection system in VANETs using local traffic density

Jithin Zacharias (Carl von Ossietzky Universität Oldenburg, Germany); Sibylle Froeschle (OFFIS Institute for Informatics, Germany)

Thursday, December 6 12:10 - 13:30

Lunch + Poster 2min Presentation

Thursday, December 6 13:30 - 14:50

S6: Performance evaluation I

Chair: Javier Gozalvez (Universidad Miguel Hernandez de Elche, Spain)

Measurement-Based Evaluation of Environmental Diffraction Modeling for 3D Vehicle-to-X Simulation

Alexander Brummer, Thomas Deinlein, Kai-Steffen Hielscher, Reinhard German and Anatoli Djanatliev (University of Erlangen-Nürnberg, Germany)

CommPact: Evaluating the Feasibility of Autonomous Vehicle Contracts

Jeremy Erickson, Shibo Chen, Melisa Savich, Shengtuo Hu and Z. Morley Mao (University of Michigan, USA)

Efficient Multi-Channel Simulation of Wireless Communications

Fabian Bronner and Christoph Sommer (Paderborn University, Germany)

Impact of Vehicle Type and Headlight Characteristics on Vehicular VLC Performance

Agon Memedi (Paderborn University, Germany); Claas Tebruegge (HELLA GmbH & Co. KGaA & Paderborn University, Germany); Julien Jahneke and Falko Dressler (Paderborn University, Germany)

Thursday, December 6 14:50 - 15:55

S7: Modeling and simulations

Chair: Christoph Sommer (Paderborn University, Germany)

A LiDAR Error Model for Cooperative Driving Simulations

Michele Segata and Renato Lo Cigno (University of Trento, Italy); Rahul Bhadani and Matthew Bunting (The University of Arizona, USA); Jonathan Sprinkle (University of Arizona, USA)

Channel Modelling for 60GHz mmWave Communication Inside Bus

Aniq Ur Rahman (National Institute of Technology Durgapur, India); Ushasi Ghosh (National Institute of Technology, Durgapur, India); Aniruddha Chandra (National Institute of Technology, Durgapur, WB, India); Ales Prokes (Brno University of Technology & Sensor, Information and Communication Systems Research Centre, Czech Republic)

Can Beacons be Compressed to Reduce the Channel Load in Vehicular Networks?

Miguel Sepulcre, Pedro Tercero and Javier Gozalvez (Universidad Miguel Hernandez de Elche, Spain)

Effect of the configuration of platooning maneuvers on the traffic flow under mixed traffic scenarios

Jesus Mena-Oreja (UMH, Spain); Javier Gozalvez and Miguel Sepulcre (Universidad Miguel Hernandez de Elche, Spain)

Thursday, December 6 15:55 - 17:00

Coffee Break + Poster/Demo

Demo: A Joint Radar and Communication System Based on Commercially Available FMCW Radar
Chang-Heng Wang and Onur Altintas (Toyota InfoTechnology Center, USA, Inc., USA)

Demo: Automatic Deployment and Dynamic Scaling of NFV Service Chaining on Bare Metal (SCBM)
Wen-Ping Lai (Yuan-Ze University, Taiwan)

Poster: Location-based Directional CSMA/CA for Millimeter Wave V2V Communications
Seungeun Oh, Hyesung Kim and Seong-Lyun Kim (Yonsei University, Korea)

Poster: Measurement-based K-Factor Model for Vehicle-To-Vehicle Communication
Jörg Fischer (Fraunhofer Institute for Integrated Circuits IIS, Germany); Robert Koch and Gerd Kilian (Fraunhofer IIS, Germany)

Poster: Parallel Implementation of the OMNeT++ INET Framework for V2X Communications
Ioannis Mavromatis, Andrea Tassi, Robert J Piechocki and Andrew Nix (University of Bristol, United Kingdom (Great Britain))

Poster: Performance Evaluation of an Open-Source Audio-Video Bridging/Time-Sensitive Networking Testbed for Automotive Ethernet
Teng Xu (University of Rome Sapienza, Italy); Florian Adamsky, Ion Turcanu and Ridha Soua (University of Luxembourg, Luxembourg); Christian Köbel (Honda R&D Europe, Germany); Thomas Engel (University of Luxemburg, Luxembourg); Andrea Baiocchi (University of Roma Sapienza, Italy)

Poster: First Performance Insights on Our Novel OFDM-based Vehicular VLC Prototype
Jörn Koepe, Christian Kaltschmidt, Marvin Illian, Robert Puknat, Pascal Kneuper, Steffen Wittemeier and Agon Memedi (Paderborn University, Germany); Claas Tebruegge (HELLA GmbH & Co. KGaA & Paderborn University, Germany); Muhammad Sohaib Amjad, Stephan Kruse and Christian Kress (Paderborn University, Germany); Christoph Scheytt (University of Paderborn, Germany); Falko Dressler (Paderborn University, Germany)

VoIP System for Bicycle Platoons
Eduardo Soares (Faculty of Science, University of Porto & Instituto de Telecomunicações, Portugal); Pedro Miguel Santos (University of Porto, Portugal); Luis Ramos Pinto (Universidade do Porto & CISTER ans Instituto de Telecomunicações, Portugal); Ana C Aguiar (University of Porto & Instituto de Telecomunicações, Portugal); Pedro Brandão (University of Porto, Faculdade de Ciências & Instituto de Telecomunicações, Portugal); Rui Prior (Instituto de Telecomunicações, Universidade do Porto & Faculdade de Ciências da Universidade do Porto, Portugal)

Poster: Hierarchical Integrity Checking in Heterogeneous Vehicular Networks
Dominik Püllen (Technical University of Darmstadt, Germany); Nikolaos Athanasios Anagnostopoulos and Tolga Arul (TU Darmstadt, Germany); Stefan Katzenbeisser (Technische Universität Darmstadt, Germany)

Poster: Space-Time-Polarization ICI Parallel Cancellation OFDM Systems
Hen-Geul Yeh (California State University Long Beach, USA); Sean (Seok-Chul) Kwon (California State University - Long Beach, USA); Son H. Doan (California State University, Long Beach, USA)

Poster: Multi-carrier Modulation on FMCW Radar for Joint Automotive Radar and Communication
Chang-Heng Wang (Toyota InfoTechnology Center, USA, Inc., USA); Ceyhun D Ozkaptan and Eylem Ekici (The Ohio State University, USA); Onur Altintas (Toyota InfoTechnology Center, USA, Inc., USA)

Tracking Vehicles Through Encrypted Mix-Zones Using Physical Layer Properties
Christian Vaas and Marc Roeschlin (University of Oxford, United Kingdom (Great Britain)); Panagiotis Papadimitratos (KTH, Sweden); Ivan Martinovic (University of Oxford, United Kingdom (Great Britain))

Message Dissemination Algorithm Based on Polar Grid of Transmission Range
Seho Han (YONSEI University, Korea); TaeYoung Kim and SuKyoung Lee (Yonsei University, Korea)

Poster: Vehicular VLC Experimental Modulation Performance Comparison
Gokhan Gurbilek, Mertkan Koca, Bugra Turan and Sinem Coleri Ergen (Koc University, Turkey)

Poster: Mix-Zones Everywhere: A Dynamic Cooperative Location Privacy Protection Scheme
Mohammad Khodaei and Panagiotis Papadimitratos (KTH, Sweden)

Poster: Formal QoS Compatibility Verification for Components on Time-Sensitive Networking
Chung-Wei Lin (National Taiwan University, Taiwan)

Thursday, December 6 17:00 - 18:00

S8: Mobility

Chair: Miguel Sepulcre (Universidad Miguel Hernandez de Elche, Spain)

Characterization and Modeling of the Bicycle-Antenna System for the 2.4GHz ISM Band
Pedro Miguel Santos (University of Porto, Portugal); Luis Ramos Pinto (Universidade do Porto & CISTER ans Instituto de Telecomunicações, Portugal); Luis Almeida (Universidade do Porto & Instituto de Telecomunicações, Portugal); Ana C Aguiar (University of Porto & Instituto de Telecomunicações, Portugal)

iMOB: An Intelligent Urban Mobility Management System Based on Vehicular Social Networks
Ademar Takeo Akabane and Roger Immich (University of Campinas, Brazil); Edmundo Madeira (State University of Campinas, Brazil); Leandro Aparecido Villas (UNICAMP, Brazil)

Platoon Formation: Optimized Car to Platoon Assignment Strategies and Protocols
Julian Heinovski and Falko Dressler (Paderborn University, Germany)

Thursday, December 6 19:00 - 21:00

Banquet

Friday, December 7

Friday, December 7 8:30 - 9:30

S9: VLC & CAN

Chair: Agon Memedi (Paderborn University, Germany)

Ringing Mitigation Schemes for Controller Area Network
Daisuke Umehara and Takeyuki Shishido (Kyoto Institute of Technology, Japan)

Vehicular VLC Frequency Domain Channel Sounding and Characterization
Bugra Turan, Gokhan Gurbilek, Ali Uyrus and Sinem Coleri Ergen (Koc University, Turkey)

Vehicular Visible Light Communication with Dynamic Vision Sensor: A Preliminary Study
Wen-Hsuan Shen, Po Wen Chen and Hsin-Mu Tsai (National Taiwan University, Taiwan)

Friday, December 7 9:30 - 10:30

Keynote 3: Softwarization and Virtualization of 5G Core Networks

Prof. Jyh-Cheng Chen

Abstract. It is envisioned in the future that not only smartphones will connect to cellular networks, but also all kinds of different wearable devices, sensors, vehicles, home appliances, VR headsets, and robots. Because the characteristics of these devices differ largely, people argue that future 5G systems should be designed to elastically accommodate different user types. The evolution of core networks will be driven by integrating heterogeneous networking technologies with the ultimate goal of migrating toward a new form of softwarized and programmable network. Network function virtualization will provide flexibility, short time to market, and low-cost solution to build network services, which are important features of 5G networks. In this talk, I'll first present the evolution of cellular systems from 1st generation (1G) to 4th generation (4G), with a focus on core networks. I'll then discuss the softwarization and virtualization of 5G core networks.

Bio. Jyh-Cheng Chen has been a Faculty Member with National Chiao Tung University (NCTU), Hsinchu, Taiwan since 2010. Prior to that, he was with Bellcore/ Telcordia Technologies in New Jersey, USA, and National Tsing Hua University (NTHU), Hsinchu, Taiwan. He is also now serving as the Convener, Computer Science Program, Ministry of Science and Technology, Taiwan. Dr. Chen received numerous awards, including the Outstanding Teaching Awards from both NCTU and NTHU, the Outstanding Research Award from the Ministry of Science and Technology, the Outstanding I. T. Elite Award, Taiwan, the K. T. Li Breakthrough Award from the Institute of Information and Computing Machinery, and the Telcordia CEO Award. He is a Fellow of the IEEE and a Distinguished Member of the ACM. He was a member of the Fellows Evaluation Committee, IEEE Computer Society.

Friday, December 7 10:30 - 10:45

Coffee Break

Friday, December 7 10:45 - 12:10

Panel

V2X Communication Requirements for Autonomous Vehicles

Abstract: Vehicle to Everything (V2X) communication has been the topic of much research, development, standards, and testing activity over the last two decades. The focus of most of these activities, including definition of the performance requirements, has been Advanced Driver Assistance Systems (ADAS), which assumes a human is in control of the vehicle. Many companies are now working on autonomous vehicle (AV) technology, where the vehicle is capable of fully automated driving in many (and eventually all) scenarios. While much of the work on AV systems has been on sensors and artificial intelligence, V2X communication is expected to play an important role in connecting an AV to other vehicles as well as infrastructure, especially when vehicles cannot detect each other using sensors. The requirements for V2X in AV systems are different from the requirements for V2X in ADAS, since the human is no longer "in the loop." In this panel, the group will address the new use cases for V2X in AV and the additional requirements for V2X features and performance that are needed to support this rapidly evolving technology.

Moderator: Dr. Jim Lansford, Qualcomm

Panelists:

- Prof. Edward Knightly, Rice University, U.S.A.
- Prof. Kang Li, National Taiwan University, Taiwan
- Dr. Hanbyul Seo, LG Electronics, Korea
- Dr. Takayuki Shimizu, TOYOTA InfoTechnology Center, U.S.A.

Friday, December 7 12:10 - 13:30

Lunch

Friday, December 7 13:30 - 14:50

S10: V2X applications and services

Chair: Daisuke Umehara (Kyoto Institute of Technology, Japan)

Real-Time Lane Change Detection Through Steering Wheel Rotation

Puttipong Leakkaw and Sooksan Panichpapiboon (King Mongkut's Institute of Technology Ladkrabang, Thailand)

Caching-as-a-Service in Virtualized Caches for Information-Centric Connected Vehicle Environments

Dennis Grewe and Marco Wagner (Robert Bosch GmbH, Germany); Sebastian Schildt (TU Braunschweig, Germany); Mayutan Arumaithurai (University of Goettingen, Germany); Hannes Frey (Universität Koblenz-Landau, Germany)

A SUMO-Based Parking Management Framework for Large-Scale Smart Cities Simulations
Lara Codeca (EURECOM, France); Jakob Erdmann (German Aerospace Center, Germany); Jérôme Härri (EURECOM, France)

Connectivity Maps for V2I communication via ETSI ITS-G5
Martin Wegner, Timo Schwarz and Lars C Wolf (Technische Universität Braunschweig, Germany)

Friday, December 7 14:50 - 15:55

S11: Protocols

Chair: Shan-Hsiang Shen (National Taiwan University of Science and Technology, Taiwan)

Cooperative Data Routing & Scheduling In Software Defined Vehicular Networks
Kushan Sudheera Kalupahana Liyanage and Maode Ma (Nanyang Technological University, Singapore); Peter Han Joo Chong (Auckland University of Technology, New Zealand)

Cooperative Content Dissemination on Vehicular Networks
Diogo Recharte (Veniam, Portugal); Ana C Aguiar (University of Porto & Instituto de Telecomunicações, Portugal); Henrique Cabral (Veniam, Portugal)

On TCP Throughput Pathology in CPU-Bound Communication over Automotive Ethernet
Wongoo Han, Sangrok Han and Hyogon Kim (Korea University, Korea)

OpenFlow based Topology Discovery Service in Software Defined Vehicular Networks: limitations and future approaches
Soufian Toufga (LAAS-CNRS, France); Slim Abdellatif (CNRS/LAAS & Université de Toulouse, INSA, LAAS, France); Philippe Owezarski (LAAS-CNRS, France); Thierry Villemur (, France)

Friday, December 7 15:55 - 16:15

Coffee Break

Friday, December 7 16:15 - 18:00

S12: Performance Evaluation II

Chair: Ashwin Ashok (Georgia State University, USA)

DrivAid: Augmenting Driving Analytics with Multi-Modal Information
Bozhao Qi, Peng Liu, Tao Ji and Wei Zhao (University of Wisconsin-Madison, USA); Suman Banerjee (University of Wisconsin, USA)

Analysing communication requirements for crowd sourced backend generation of HD Maps used in automated driving
Florian Jomrich (Technische Universität Darmstadt, Germany); Josef Schmid (Ostbayerische Technische Hochschule Amberg-Weiden, Germany); Steffen Knapp (Opel Automobile GmbH, Germany); Alfred Höß (OTH Amberg-Weiden, Germany); Ralf Steinmetz (Technische Universität Darmstadt, Germany); Björn W Schuller (Imperial College London & University of Augsburg, United Kingdom (Great Britain))

Large-Scale VANET Simulations and Performance Analysis using Real Taxi Trace and City Map Data
Pietro Carnelli (University of Bristol, United Kingdom (Great Britain)); Mahesh Sooriyabandara (Toshiba Research Europe Limited, United Kingdom (Great Britain)); R Eddie Wilson (University of Bristol, United Kingdom (Great Britain))

Multiple Access in Cellular V2X: Performance Analysis in Highly Congested Vehicular Networks
Behrad Toghi, MD Saifuddin, Muhammad Ozair Mughal, Hossein Nourkhiz Mahjoub and Yaser P. Fallah (University of Central Florida, USA); Jayanthi Rao (Ford Motor Company & ASEE-NSF, USA); Sushanta Das (Ford Inc., USA)

ATHENA: A Pagerank-based Scheme to Solve the Thundering Herd in Authentication

Chao Chen (University of Warwick, United Kingdom (Great Britain))

Conceptual Sensors Testing Framework for Autonomous Vehicles

Suleiman Alsweiss, Michael Jernigan, Rahul Razdan and James Cathcart (Florida Polytechnic University, USA)