2016 IEEE Vehicular Networking Conference (VNC 2016)

Columbus, Ohio, USA
8-10 December 2016

Thursday, December 8, 09:15 - 09:45

O: Opening

Thursday, December 8, 09:45 - 10:30

K1: Keynote on Smart Columbus

Thursday, December 8, 10:30 - 11:00

C1: Coffee Break

Thursday, December 8, 11:00 - 12:00

S1: Physical Layer

Performance Comparison of IEEE 802.11p and ARIB STD-T109   1
Julian Heinovski (Paderborn University, Germany); Florian Klingler and Falko Dressler (University of Paderborn, Germany); Christoph Sommer (Paderborn University, Germany)

Vehicle-to-Barrier Communication During Real-World Vehicle Crash Tests   9
Samil Temel (Turkish Air Force Academy, Turkey); Mehmet Can Vuran and Mohammad Lunar (University of Nebraska-Lincoln, USA); Ronald K Faller (University of Nebraska-Lincoln & Midwest Roadside Safety Facility, USA); Cody Stolle (University of Nebraska-Lincoln, USA)

On the Impact of Antenna Patterns on VANET Simulation   17
David Eckhoff (University of Erlangen, Germany); Alexander Brummer (University of Erlangen-Nuremberg, Germany); Christoph Sommer (Paderborn University, Germany)

Thursday, December 8, 12:00 - 13:00

L1: Lunch

Thursday, December 8, 13:00 - 14:10

S2: Visible Light Communications

Time Variation in Vehicle-to-Vehicle Visible Light Communication Channels   21
Ai-Ling Chen, Hao-Ping Wu, Yu-Lin Wei and Hsin-Mu Tsai (National Taiwan University, Taiwan)

Broadcasting Brake Lights with MIMO-OFDM Based Vehicular VLC   29
Bugra Turan (Koc University, Turkey); Omer Narmanlioglu (P. I. Works & Ozyegin University, Turkey); Sinem Coleri Ergen (Koc University, Turkey); Murat Uysal (Ozyegin University, Turkey)

Development of Low-Complexity MLE Method for Image-Sensor-Based Visible Light Communication   36
Yuki Ohira and Tomohiro Yendo (Nagaoka University of Technology, Japan); Shintaro Arai (Okayama University of Science, Japan)

Thursday, December 8, 14:10 - 15:40

App: App Contest

Thursday, December 8, 15:40 - 16:10

C2: Coffee Break

Thursday, December 8, 16:10 - 18:10

S3: Vehicle Sensing

Realizing Collective Perception in a Vehicle   44
    Hendrik-Jörn Günther (Volkswagen Group Research & Technische Universität Braunschweig, Germany); Björn Mennenga (Volkswagen Group Research, Germany); Oliver Trauer (C4C Engineering GmbH, Germany); Raphael Riebl (Technische Hochschule Ingolstadt, Germany); Lars C Wolf (Technische Universität Braunschweig, Germany)

Collective Perception and Decentralized Congestion Control in Vehicular Ad-hoc Networks   52
    Hendrik-Jörn Günther (Volkswagen Group Research & Technische Universität Braunschweig, Germany); Raphael Riebl (Technische Hochschule Ingolstadt, Germany); Lars C Wolf (Technische Universität Braunschweig, Germany); Christian Facchi (Ingolstadt University of Applied Sciences, Germany)

Establishing Vehicular Ground Truth   60
    Pallavi Meharia (University of Cincinnati, USA); Biswajit Panja (Eastern Michigan University, USA); Dharma P Agrawal (University of Cincinnati, USA)

Coordinated Merge Control Based on V2V Communication   68
    Fang-Chieh Chou (University of California, Berkeley, USA); Steven Shladover (UC Berkeley, USA); Gaurav Bansal (Toyota InfoTechnology Center, USA)

MOVESET: MOdular VEhicle SEnsor Technology   76
    Qi Chen, Brendan Bellows and Mike P Wittie (Montana State University, USA); Stacy Patterson (Rensselaer Polytechnic Institute, USA); Qing Yang (Montana State University, USA)

Towards Characterizing Bluetooth Discovery in a Vehicular Context   80
    Walter Bronzi, Thierry Derrmann and German Castignani (University of Luxembourg / SnT, Luxembourg); Thomas Engel (University of Luxemburg, Luxembourg)

Friday, December 9

Friday, December 9, 09:00 - 09:45

K2: Keynote by Prof. Umit Ozguner

Communication Needs in Collaborative Driving
Prof. Umit Ozguner

Friday, December 9, 09:45 - 10:15

C3: Coffee Break

Friday, December 9, 10:15 - 11:45

S4: LTE & 5G

On the Overhead of Radio Resource Management Schemes for Mobile Underlay D2D Communication   84
> Mladen Botsov (BMW Group Research and Technology & Technische Universität Berlin, Germany); Slawomir Stanczak (Fraunhofer Heinrich Hertz Institute & Technische Universität Berlin, Germany); Peter Fertl (BMW Group Research and Technology, Germany)

Enhanced Autonomous Resource Selection for LTE-Based V2V Communication   92
> Jiaxin Yang (McGill University, Canada); Benoit Pelletier (InterDigital Canada, Canada); Benoit Champagne (McGill University, Canada)

Pick the Right Guy: CQI-Based LTE Forwarder Selection in VANETs   98
> Ion Turcanu (University of Rome "La Sapienza", Italy); Christoph Sommer (Paderborn University, Germany); Andrea Baiocchi (University of Roma Sapienza, Italy); Falko Dressler (University of Paderborn, Germany)

A 5G V2X Testbed for Cooperative Automated Driving   106
> Hanwen Cao, Sandip Gangakhedkar, Ali Ali and Mohamed Gharba (Huawei German Research Center, Germany); Joseph Eichinger (Huawei Technologies Duesseldorf GmbH, European Research Center (ERC), Germany)

Friday, December 9, 11:45 - 12:45

L2: Lunch

Friday, December 9, 12:45 - 13:30

S5: Formal Modeling & Simulation

Formal Models for Automotive Systems and Vehicular Networks: Benefits and Challenges   110
> Eduardo dos Santos (University of Oxford, United Kingdom & CAPES Foundation, Brazil); Dominik Schoop (Esslingen University of Applied Sciences, Germany); Andrew Simpson (University of Oxford, United Kingdom)

Formally Verifiable Modeling of In-Vehicle Time-Sensitive Networks (TSN) Based on Logic Programming   118
> Morteza Hashemi Farzaneh (Technical University of Munich, Germany); Sina Shafaei (Technische Universität München, Germany); Alois Knoll (Technical University Munich Garching, Germany)

Partitioning of Urban Transportation Networks Utilizing Real-World Traffic Parameters for Distributed Simulation in SUMO   122
> Md Salman Ahmed and Mohammad Asadul Hoque (East Tennessee State University, USA)

Friday, December 9, 13:30 - 14:00

P1: 2-min Presentation for Poster/Demo 1

Poster: Using Clusters of Parked Cars as Virtual Vehicular Network Infrastructure   126
    Florian Hagenauer and Christoph Sommer (Paderborn University, Germany); Takamasa Higuchi (Toyota InfoTechnology Center, Japan); Onur Altintas (Toyota InfoTechnology Center, USA, Inc., USA); Falko Dressler (University of Paderborn, Germany)

Poster: Efficient Cluster-Based Resource Allocation for Co-Existing Vehicle and Cellular Users   128
    Idoia de la Iglesia (University of Deusto, Spain & Nokia Bell Labs, Poland); Unai Hernández-Jayo (University of Deusto, Spain); Maciej Januszewski and Jedrzej Stanczak (Nokia Bell Labs, Poland); Eneko Osaba (University of Deusto, Spain); Roberto Carballedo (University of Deusto & Deusto Foundation - Deusto Institute of Technology, Spain)

Poster: Reliability Enhancement in V2V Networks Through Vehicle-Assisted Relaying   130
    Hussain Elkotby and Mai Vu (Tufts University, USA)

Poster: A TDM Approach for Latency Reduction of Ultra-Reliable Low-Latency Data in 5G   132
    Karthikeyan Ganesan (Huawei Technologies GmbH & Germany, Germany); Tapisha Soni (Huawei Technologies Duesseldorf GmbH, Germany); Swaroop Nunna (Huawei Technologies Duesseldorf GmbH & European Research Center, Germany); Ali Ali (Huawei German Research Center, Germany)

Poster: A Scheduling Method for V2V Networks Using Successive Interference Cancellation   134
    Yuta Watanabe, Koya Sato and Takeo Fujii (The University of Electro-Communications, Japan)

Poster: Power over Data Lines for CAN Using AMI Code   136
    Tatsuki Matsushita, Daisuke Umehara and Wakasugi Koichiro (Kyoto Institute of Technology, Japan)

Poster: Symbol Detection with OR Rule for CAN FD   138
    Natsumi Sato, Daisuke Umehara and Wakasugi Koichiro (Kyoto Institute of Technology, Japan)

Poster: On-Board Camera Video Transmission over Vehicular VLC   140
    Omer Narmanlioglu (P. I. Works & Ozyegin University, Turkey); Bugra Turan (Koc University, Turkey); Burak Kebapci (Ozyegin University, Turkey); Sinem Coleri Ergen (Koc University, Turkey); Murat Uysal (Ozyegin University, Turkey)

Poster: Monitoring Transit Systems Using Low Cost WiFi Technology   142
    Samy S. El-Tawab, Raymond Oram, Michael Garcia and Chris Johns (James Madison University, USA); B. Brian Park (University of Virginia, USA)

Poster: LuST-LTE: A Simulation Package for Pervasive Vehicular Connectivity   144
    Thierry Derrmann (University of Luxembourg / SnT, Luxembourg); Sébastien Faye (University of Luxembourg, SnT, Luxembourg); Raphael Frank (University of Luxembourg, Luxembourg); Thomas Engel (University of Luxemburg, Luxembourg)

Poster: A Lightweight Localization Algorithm Using V2V and V2I Short Range Communication in Highly Dense Reference Networks   146
    Heath J. LeBlanc, Firas Hassan and Edgar Gomez (Ohio Northern University, USA); Nesreen Alsbou (University of Central Oklahoma, USA)

Poster: A Hybrid MAC Scheme for Emergency Systems in Urban VANETs Environment   148
    Saifullah Khan (Carl von Ossietzky University, Oldenburg, Germany); Muhammad Alam (Instituto de Telecomunicacões, Portugal); Nils Henning Müllner (Mälardalen University, Sweden); Martin Fränzle (OFFIS Institute for Computer Science and University of Oldenburg, Germany)

Demo: OpenC2X - An Open Source Experimental and Prototyping Platform Supporting ETSI ITS-G5   150
    Sven Laux, Gurjashan Singh Pannu, Stefan Schneider, Jan Tiemann and Florian Klingler (University of Paderborn, Germany); Christoph Sommer (Paderborn University, Germany); Falko Dressler (University of Paderborn, Germany)

Demo: Real-time Vehicle Movement Tracking on Android Devices Through Bluetooth Communication with DSRC Devices   152
> Md Salman Ahmed and Mohammad Asadul Hoque (East Tennessee State University, USA); Asad Khattak (University of Tennessee, USA)

Poster: SafeRoute A Framework for Assessment of Road Safety   154
> R. Vince Rabsatt (University of California Los Angeles, USA); Haik Kalantarian (University of California, Los Angeles, USA); Mario Gerla (University of California at Los Angeles, USA)

Friday, December 9, 14:00 - 15:30

C4: Poster/Demo 1 (with coffee)

Friday, December 9, 15:30 - 16:40

S6: Multi-hop Communications I

LASP: Look-Ahead Spatial Protocol for Vehicular Multi-hop Communication   156
> Rui Meireles and Peter Steenkiste (Carnegie Mellon University, USA); Joao Barros (Instituto de Telecomunicações & Universidade do Porto, Portugal); Daniel C. Moura (University of Porto, Portugal)

Towards Reliable Multi-Hop Broadcast in VANETs: An Analytical Approach   164
> Mozhdeh Gholibeigi, Mitra Baratchi, Hans van den Berg and Geert Heijenk (University of Twente, The Netherlands)

Selective Message Relaying for Multi-Hopping Vehicular Networks   172
> Bengi Aygun (Nokia Bell Labs, Germany); Chung-Wei Lin and Shinichi Shiraishi (Toyota InfoTechnology Center, USA); Alexander M. Wyglinski (Worcester Polytechnic Institute, USA)

Friday, December 9, 16:40 - 16:55

C5: Short Break

Friday, December 9, 16:55 - 18:05

S7: Multi-hop Communications II

Low-Delay Forwarding with Multiple Candidates for VANETs Using Multi-Criteria Decision Making   180
> Karsten Roscher and Josef Jiru (Fraunhofer ESK, Germany); Rudi Knorr (Fraunhofer Institute for Embedded Systems and Communication Technologies (ESK), Germany)

PeRCeIVE: Proactive Caching in ICN-based VANETs   188
> Dennis Grewe and Marco Wagner (Robert Bosch GmbH, Germany); Hannes Frey (Universität Koblenz-Landau, Germany)

Connected Vehicles Under Information-Centric Architectures   196
> Mehrnaz Tavan (Rutgers, the State University of New Jersey, USA); Roy Yates and Dipankar Raychaudhuri (Rutgers University, USA)

Saturday, December 10, 09:00 - 10:10

S8: Application I

eCall++: An Enhanced Emergency Call System for Improved Road Safety   204
Jon Blancou and João Almeida (Instituto de Telecomunicações, DETI - University of Aveiro, Portugal); Bruno Fernandes and Luis Silva (Instituto de Telecomunicações, Portugal); Muhammad Alam (Instituto de Telecomunicacões, Portugal); José Fonseca (Universidade de Aveiro, Portugal); Joaquim Ferreira (University of Aveiro, Portugal)

RideSense: Towards Ticketless Transportation   212
Rufeng Meng (University of South Carolina, USA); David W Grömling (Technische Universität Darmstadt, Germany); Romit Roy Choudhury (University of Illinois at Urbana-Champaign, USA); Srihari Nelakuditi (University of South Carolina, USA)

Adaptive Cloud Offloading for Vehicular Applications   220
Ashwin Ashok (Georgia State University, USA); Peter Steenkiste (Carnegie Mellon University, USA); Fan Bai (General Motors, USA)

Saturday, December 10, 10:10 - 10:30

C6: Coffee Break

Saturday, December 10, 10:30 - 11:50

S9: Application II

Technical Evaluation of GLOSA Systems and Results From the Field   228
Rainer Stahlmann and Malte Möller (AUDI AG, Germany); Alexej Brauer (Technische Universtität München, Germany); Reinhard German and David Eckhoff (University of Erlangen, Germany)

Detecting Relative Position of User Devices and Mobile Access Points   236
Leonid Kholkine (University of Porto, Portugal); Pedro Miguel Santos (University of Porto & Instituto de Telecomunicacoes, Portugal); André Cardote (Instituto de Telecomunicações, Universidade de Aveiro, Portugal); Ana C Aguiar (Instituto de Telecomunicações & University of Porto, Portugal)

Cooperative ITS for Two-Wheel Vehicles to Improve Safety on Roads   244
Jose Santa (University Centre of Defence at the Spanish Air Force Academy, Spain); Pedro Javier Fernández Ruiz (University of Murcia, Spain); Miguel Angel Zamora (University Of Murca, Spain)

Saturday, December 10, 11:50 - 12:50

L3: Lunch

Saturday, December 10, 12:50 - 14:30

K3: Panel: The Future of V2X Communication

Organizer: Dr. Jim Lansford, Qualcomm

Saturday, December 10, 14:30 - 15:50

S10: Security and Privacy

Vehicular PKI Scalability-Consistency Trade-Offs in Large Scale Distributed Scenarios   248
Pierpaolo Cincilla (SystemX, France); Omar Hicham (University of Pierre and Marie Curie, France); Benoit Charles (IDnomic, France)

Marrying Safety with Privacy: A Holistic Solution for Location Privacy in VANETs   256
David Eckhoff (University of Erlangen, Germany); Christoph Sommer (Paderborn University, Germany)

Security Vulnerabilities of IEEE 802.11p and Visible Light Communication Based Platoon   264
Seyhan Ucar, Sinem Coleri Ergen and Oznur Ozkasap (Koc University, Turkey)

Exploiting Propagation Effects for Authentication and Misbehavior Detection in VANETs   268
Ala'a Al-Momani, Rens van der Heijden and Frank Kargl (Ulm University, Germany); Christian Waldschmidt (University of Ulm, Germany)

Proactive Certificate Validation for VANETs   272
Hongyu Jin and Panagiotis Papadimitratos (KTH, Sweden)

Saturday, December 10, 15:50 - 16:20

P2: 2-min Presentation for Poster/Demo 2

Poster: V2V Communication- Keeping You Under Non-Disputable Surveillance -   276
Markus Ullmann (Federal Office for Information Security & University of Applied Sciences Bonn-Rhein-Sieg, Germany); Thomas Strubbe (BSI, Germany); Christian Wieschebrink (Federal Office for Information Security (BSI), Germany)

Poster: Simple Key Management Scheme for In-Vehicle System   278
Toru Sakon (University of Hyogo & Sumitomo Electric Industries, ltd., Japan); Yukikazu Nakamoto (University of Hyogo, Japan)

Poster: Hardware Based Security Enhanced Framework for Automotives   280
Ali Shuja Siddiqui and Yutian Gui (Florida Institute of Technology, USA); Jim Plusquellic (University of New Mexico, USA); Fareena Saqib (Florida Institute of Technology, USA)

Poster: Anomaly-Based Misbehaviour Detection in Connected Car Backends   282
Olga Berlin (Daimler AG, Germany); Matthias Matousek (Ulm University, Germany); Albert Held (Daimler AG, Germany); Frank Kargl (Ulm University, Germany)

Poster: PREXT: Privacy Extension for Veins VANET Simulator 284
Karim Emara (SnT, University of Luxembourg, Luxembourg)

Poster: Message Authentication and Secret Key Agreement in VANETs via Angle of Arrival   286
Amr Abdelaziz (The Ohio State University & Military Technical College, USA); Can Emre Koksal (The Ohio State University, USA); Ron Burton (Transportation Research Center, Columbus, OH, USA)

Poster: On the Effect of RF Jamming Attack on Autonomous Platooning Systems with Radio and VLC Hybrid Communication   288
Susumu Ishihara and Yusuke Ueta (Shizuoka University, Japan); Mario Gerla (University of California at Los Angeles, USA)

Poster: Qualia Exploitation of Sensing Technology (QuEST) for Vehicular Network Optimization   290
Teresa Hawkes (University of Oklahoma, USA); Trevor Bihl (Air Force Institiute of Technology, USA); Steven Rogers (Air Force Research Laboratory, USA)

Saturday, December 10, 16:20 - 17:50

C7: Poster/Demo 2 (with coffee)

Saturday, December 10, 17:50 - 18:10

C: Closing