## Technical Program

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<td>9:00 - 9:15</td>
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<td>9:15 - 9:45</td>
<td>O: Opening</td>
<td>K2: Keynote by Prof. Umit Ozguner</td>
<td>S8: Application I</td>
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<td>9:45 - 10:15</td>
<td>K1: Keynote on Smart Columbus</td>
<td>C3: Coffee break</td>
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<td>10:30 - 11:00</td>
<td>C1: Coffee break</td>
<td>S4: LTE &amp; 5G</td>
<td>C6: Coffee break</td>
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<td>11:00 - 11:45</td>
<td>S1: Physical Layer</td>
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<td>12:00 - 12:20</td>
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<td>L2: Lunch</td>
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<td>13:00 - 13:20</td>
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<td>S5: Formal Modeling &amp; Simulation</td>
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<td>14:00 - 14:10</td>
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<td>C4: Poster/demo 1 (with coffee)</td>
<td>P2: 2-min Presentation for poster/demo 2</td>
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<td>15:00 - 15:30</td>
<td>App: App contest</td>
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<td>15:40 - 16:10</td>
<td>C2: Coffee break</td>
<td>S6: Multi-hop Communications I</td>
<td>C7: Poster/demo 2 (with coffee)</td>
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<td>16:40 - 16:55</td>
<td>S3: Vehicle Sensing</td>
<td>C5: short break</td>
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<td>S7: Multi-hop Communications II</td>
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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

11:00 **Performance Comparison of IEEE 802.11p and ARIB STD-T109**
Julian Heinovski (Paderborn University, Germany); Florian Klingler and Falko Dressler (University of Paderborn, Germany); Christoph Sommer (Paderborn University, Germany)

11:22 **Vehicle-to-Barrier Communication During Real-World Vehicle Crash Tests**
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)

11:44 **On the Impact of Antenna Patterns on VANET Simulation**
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

13:00 **Time Variation in Vehicle-to-Vehicle Visible Light Communication Channels**
Ai-Ling Chen, Hao-Ping Wu, Yu-Lin Wei and Hsin-Mu Tsai (National Taiwan University, Taiwan)

13:22 **Broadcasting Brake Lights with MIMO-OFDM Based Vehicular VLC**
Bugra Turan (Koc University, Turkey); Omer Narmanlioglu (P. I. Works & Ozyegin University, Turkey); Sinem Coleri Ergen (Koc University & University of California Berkeley, Turkey); Murat Uysal (Ozyegin University, Turkey)

13:44 **Development of Low-Complexity MLE Method for Image-Sensor-Based Visible Light Communication**
Yuki Ohira and Tomohiro Yendo (Nagaoka University of Technology, Japan); Shintaro Arai (Okayama University of Science, Japan)

13:55 **Prospects of Differential Optical Receiver with Ambient Light Compensation in Vehicular Visible Light Communication**
Mohammad Rakibul Alam and Saleh Faruque (University of North Dakota, USA)

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

App: App contest

Thursday, December 8, 15:40 - 16:10
Thursday, December 8, 16:10 - 17:40

S3: Vehicle Sensing

16:10 Realizing Collective Perception in a Vehicle
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)

16:32 Collective Perception and Decentralized Congestion Control in Vehicular Ad-hoc Networks
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)

16:54 Establishing Vehicular Ground Truth
Pallavi Meharia (University of Cincinnati, USA); Biswajit Panja (Eastern Michigan University, USA); Dharma P Agrawal (University of Cincinnati, USA)

17:16 MOVESET: MODular VEHICLE SENSOR Technology
Qi Chen, Brendan Bellows and Mike P Wittie (Montana State University, USA); Stacy Patterson (Rensselaer Polytechnic Institute, USA); Qing Yang (Montana State University, USA)

17:27 Towards Characterizing Bluetooth Discovery in a Vehicular Context
Walter Bronzi, Thierry Derrmann and German Castignani (University of Luxembourg / SnT, Luxembourg); Thomas Engel (University of Luxembourg, 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

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)

10:37 Enhanced Autonomous Resource Selection for LTE-Based V2V Communication
Jiaxin Yang (McGill University, Canada); Benoit Pelletier (InterDigital Canada, Canada); Benoit Champagne (McGill University, Canada)

10:59 Pick the Right Guy: CQI-Based LTE Forwarder Selection in VANETs
Ion Turcanu (University of Rome "La Sapienza", Italy); Christoph Sommer (Paderborn
11:21 A 5G V2X Testbed for Cooperative Automated Driving
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

12:45 Formal Models for Automotive Systems and Vehicular Networks: Benefits and Challenges
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)

13:07 Formally Verifiable Modeling of In-Vehicle Time-Sensitive Networks (TSN) Based on Logic Programming
Morteza Hashemi Farzaneh (Technical University of Munich, Germany); Alois Knoll (Technical University Munich Garching, Germany); Sina Shafaei (Technische Universität München, Germany)

13:18 Partitioning of Urban Transportation Networks Utilizing Real-World Traffic Parameters for Distributed Simulation in SUMO
Mohammad Asadul Hoque and Md Salman Ahmed (East Tennessee State University, USA)

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

P1: 2-min Presentation for poster/demo 1

13:30 Poster: Using Clusters of Parked Cars as Virtual Vehicular Network Infrastructure
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)

13:32 Poster: Efficient Cluster-Based Resource Allocation for Co-Existing Vehicle and Cellular Users
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)

Hussain Elkotby and Mai Vu (Tufts University, USA)

13:36 Poster: A TDM Approach for Latency Reduction of Ultra-Reliable Low-Latency Data in 5G
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)

13:38 Poster: Insights on Communication Range and Capacity Requirements of Automated Vehicles
Miguel Sepulcre (Universidad Miguel Hernandez de Elche, Spain); Onur Altintas (Toyota InfoTechnology Center, USA, Inc., USA); Falko Dressler (University of Paderborn, Germany)
13:40 Poster: A Scheduling Method for V2V Networks Using Successive Interference Cancellation
Yuta Watanabe, Koya Sato and Takeo Fujii (The University of Electro-Communications, Japan)

13:42 Poster: Power over Data Lines for CAN Using AMI Code
Tatsuki Matsushita, Daisuke Umehara and Wakasugi Koichiro (Kyoto Institute of Technology, Japan)

13:44 Poster: Symbol Detection with OR Rule for CAN FD
Natsumi Sato, Daisuke Umehara and Wakasugi Koichiro (Kyoto Institute of Technology, Japan)

13:46 Poster: On-Board Camera Video Transmission over Vehicular VLC
Omer Narmanlioglu (P. I. Works & Ozyegin University, Turkey); Bugra Turan (Koc University, Turkey); Burak Kebapci (Ozyegin University, Turkey); Sinem Coleri Ergen (Koc University & University of California Berkeley, Turkey); Murat Uysal (Ozyegin University, Turkey)

13:48 Poster: Monitoring Transit Systems Using Low Cost WiFi Technology
Samy S. El-Tawab, Raymond Oram, Michael Garcia and Chris Johns (James Madison University, USA); B. Brian Park (University of Virginia, USA)

13:50 Poster: LuST-LTE: A Simulation Package for Pervasive Vehicular Connectivity
Thierry Derrmann (University of Luxembourg / SnT, Luxembourg); Sébastien Faye (University of Luxembourg, SnT, Luxembourg); Raphael Frank (University of Luxembourg, Luxembourg); Thomas Engel (University of Luxembourg, Luxembourg)

13:52 Poster: A Lightweight Localization Algorithm Using V2V and V2I Short Range Communication in Highly Dense Reference Networks
Heath J. LeBlanc, Firas Hassan and Edgar Gomez (Ohio Northern University, USA); Nesreen Alsbou (University of Central Oklahoma, USA)

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)

13:56 Demo: Real-time Vehicle Movement Tracking on Android Devices Through Bluetooth Communication with DSRC Devices
Md Salman Ahmed and Mohammad Asadul Hoque (East Tennessee State University, USA); Asad Khattak (University of Tennessee, USA)

13:58 Demo: An Architecture for V2X Communication-Centric Traffic Light Controllers
Norbert Varga and Laszlo Bokor (Budapest University of Technology and Economics, Hungary); András Takács, József Kovács and László Virág (Commsignia Inc., Hungary)

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

15:30 LASP: Look-Ahead Spatial Protocol for Vehicular Multi-hop Communication
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)

15:52 Towards Reliable Multi-Hop Broadcast in VANETs: An Analytical Approach
Mozhdeh Gholibeigi, Mitra Baratchi, Hans van den Berg and Geert Heijenk (University of Twente, The Netherlands)
Friday, December 9, 16:40 - 16:55

**C5: short break**

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

**S7: Multihop Communications II**

16:55 *Low-Delay Forwarding with Multiple Candidates for VANETs Using Multi-Criteria Decision Making*
Karsten Roscher and Josef Jiru (Fraunhofer ESK, Germany); Rudi Knorr (Fraunhofer Institute for Embedded Systems and Communication Technologies (ESK), Germany)

17:17 *PeRCEIVE: Proactive Caching in ICN-based VANETs*
Dennis Grewe and Marco Wagner (Robert Bosch GmbH, Germany); Hannes Frey (Universität Koblenz-Landau, Germany)

17:39 *Connected Vehicles Under Information-Centric Architectures*
Mehrnaz Tavan (Rutgers, the State University of New Jersey, USA); Roy Yates and Dipankar Raychaudhuri (Rutgers University, USA)

Saturday, December 10

Saturday, December 10, 09:00 - 10:30

**S8: Application I**

09:00 *eCall++: An Enhanced Emergency Call System for Improved Road Safety*
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 Telecomunicações, Portugal); José Fonseca (Universidade de Aveiro, Portugal); Joaquim Ferreira (University of Aveiro, Portugal)

09:22 *RideSense: Towards Ticketless Transportation*
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)

09:44 *Coordinated Merge Control Based on V2V Communication*
Fang-Chieh Chou (University of California, Berkeley, USA); Steven Shladover (UC Berkeley, USA); Gaurav Bansal (Toyota InfoTechnology Center, USA)

10:06 *Adaptive Cloud Offloading for Vehicular Applications*
Ashwin Ashok (Georgia State University, USA); Peter Steenkiste (Carnegie Mellon University, USA); Fan Bai (General Motors, USA)

Saturday, December 10, 10:30 - 11:00

**C6: Coffee break**

Saturday, December 10, 11:00 - 12:20

**S9: Application II**

11:00 *Technical Evaluation of GLOSA Systems and Results From the Field*
11:22 Detecting Relative Position of User Devices and Mobile Access Points
Leonid Khokhine (University of Porto, Portugal); Pedro Miguel Santos (University of Porto & Instituto de Telecomunicacoes, Portugal); André Cardote (Instituto de Telecomunicacoes, Universidade de Aveiro, Portugal); Ana C Aguiar (Instituto de Telecomunicacoes & University of Porto, Portugal)

11:44 A Four Dimensional Model for VANET Destination Prediction
Nardine Basta (University of Ulm, Germany); Amal Elnahas (The British University in Egypt, Egypt); Hans Peter Großmann (Ulm University, Germany); Slim Abdennadher (GUC, Egypt)

12:06 Cooperative ITS for Two-Wheel Vehicles to Improve Safety on Roads
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, 12:20 - 13:20
L3: Lunch

Saturday, December 10, 13:20 - 15:00
K3: Panel: The Future of V2X Communication
Organizer: Dr. Jim Lansford, Qualcomm

Saturday, December 10, 15:00 - 15:30
P2: 2-min Presentation for poster/demo 2

15:00 Poster: V2V Communication- Keeping You Under Non-Disputable Surveillance -
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)

15:02 Poster: Simple Key Management Scheme for In-Vehicle System
Toru Sakon (University of Hyogo & Sumitomo Electric Industries, ltd., Japan); Yukikazu Nakamoto (University of Hyogo, Japan)

15:04 Poster: Hardware Based Security Enhanced Framework for Automotives
Ali Shuja Siddiqi and Yutian Gui (Florida Institute of Technology, USA); Jim Plusquellic (University of New Mexico, USA); Fareena Saqib (Florida Institute of Technology, USA)

15:06 Poster: Anomaly-Based Misbehaviour Detection in Connected Car Backends
Olga Berlin (Daimler AG, Germany); Matthias Matousek (Ulm University, Germany); Albert Held (Daimler AG, Germany); Frank Kargl (Ulm University, Germany)

15:08 Poster: PREXT: Privacy Extension for Veins VANET Simulator
Karim Emara (SnT, University of Luxembourg, Luxembourg)

15:10 Poster: SafeRoute: A Framework for Assessment of Road Safety
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)

15:12 Poster: Message Authentication and Secret Key Agreement in VANETs via Angle of Arrival
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)

15:14 Poster: On the Effect of RF Jamming Attack on Autonomous Platooning Systems
with Radio and VLC Hybrid Communication
Susumu Ishihara and Yusuke Ueta (Shizuoka University, Japan); Mario Gerla (University of California at Los Angeles, USA)

15:16 Poster: Qualia Exploitation of Sensing Technology (QuEST) for Vehicular Network Optimization
Teresa Hawkes (University of Oklahoma, USA); Trevor Bihl (Air Force Institute of Technology, USA); Steven Rogers (Air Force Research Laboratory, USA)

15:18 Poster: Synchronised Charging of Electric Vehicles with Distant Renewable Energy Resources
Tobias Kleinschmidt and Oliver Fuhr (TU Dortmund University, Germany); Christian Wietfeld (TU Dortmund University & Communication Networks Institute, Germany)

15:20 Poster: Electric Vehicle Network Bidirectional Charging for Flexible Vehicle-to-Grid Services
Seungwook Yoon and Euiseok Hwang (Gwangju Institute of Science and Technology, Korea)

15:22 Demo: A Prototype for a Platoon-based Cyclist Cooperative System
Juan Salamanca (Icesi University, Colombia); Sandra Céspedes (Universidad de Chile, Chile); Daniel Vinasco (Universidad Icesi, Colombia); Alexis Yañez (Universidad de Chile, Chile)

15:24 Demo: Communication Requirements of CACC for High-Density Platooning
Marcin Ochocki, Vladimir Vukadinovic and Maciej Januszewski (Nokia Bell Labs, Poland); Idoia de la Iglesia (University of Deusto, Spain & Nokia Bell Labs, Poland)

Saturday, December 10, 15:30 - 17:00

C7: Poster/demo 2 (with coffee)

Saturday, December 10, 17:00 - 18:20

S10: Security and Privacy

17:00 Vehicular PKI Scalability-Consistency Trade-Offs in Large Scale Distributed Scenarios
Pierpaolo Cincilla (SystemX, France); Omar Hicham (University of Pierre and Marie Curie, France); Benoit Charles (IDnomic, France)

17:22 Marrying Safety with Privacy: A Holistic Solution for Location Privacy in VANETs
David Eckhoff (University of Erlangen, Germany); Christoph Sommer (Paderborn University, Germany)

17:44 Security Vulnerabilities of IEEE 802.11p and Visible Light Communication Based Platoon
Seyhan Ucar (Koc University, Turkey); Sinem Coleri Ergen (Koc University & University of California Berkeley, Turkey); Oznur Ozkasap (Koc University, Turkey)

17:55 Exploiting Propagation Effects for Authentication and Misbehavior Detection in VANETs
Aia’a Al-Momani, Rens van der Heijden and Frank Kargl (Ulm University, Germany); Christian Waldschmidt (University of Ulm, Germany)

18:06 Proactive Certificate Validation for VANETs
Hongyu Jin and Panagiotis Papadimitratos (KTH, Sweden)

Saturday, December 10, 18:20 - 18:50

C: Closing