# CONTENTS

## INVITED SPEAKERS

### KEYNOTE SPEAKERS

Driving Automated Vehicles in Complex Conditions  
*Bart van Arem*  

Optimization, Modeling and Assessment of Smart City Transportation Systems  
*Hesham A. Rakha*  

## PAPERS

### FULL PAPERS

Unconstrained License Plate Detection in Hardware  
*Petr Musil, Roman Juránek and Pavel Zemčík*  

Radar Artifact Labeling Framework (RALF): Method for Plausible Radar Detections in Datasets  
*Simon T. Isele, Marcel P. Schilling, Fabian E. Klein, Sascha Saralajew and J. Marius Zoellner*  

Total Cost of Ownership for Automated and Electric Drive Vehicles  
*Lambros Mitropoulos, Konstantinos Kouretas, Konstantinos Kepapisoglou and Eleni Vlahogianni*  

An Empirical Study on Low-cost, Portable Vehicle’s Weight Estimation Solution using Smartphone’s Acceleration Data for Developing Countries  
*Saima Mohan and Prashant Kumar*  

Time Series Segmentation for Driving Scenario Detection with Fully Convolutional Networks  
*Philip Elspas, Yannick Klose, Simon Isele, Johannes Bach and Eric Sax*  

Turning Rate Estimation in Roundabouts: Analysis and Validation of Different Estimation Methods  
*Mánuel Gressai and Tamás Tettamanti*  

Dynamic and Continuous Berth Allocation using Cuckoo Search Optimization  
*Sheraz Aslam, Michalis P. Michaelides and Herodotos Herodotou*  

Soft Fault Detection and Localization in an Unshielded Twisted Pair Network using Power Line Communication  
*Abdel Karim Abdel Karim, Virginie Degardin, Vincent Cocquempot and M. Amine Atoui*  

Water Hazard Depth Estimation for Safe Navigation of Intelligent Vehicles  
*Zoltan Rozsa, Marcell Golarits and Tamas Sziranyi*  

A Survey on Decentralized Cooperative Maneuver Coordination for Connected and Automated Vehicles  
*Daniel Maksimovski, Andreas Festag and Christian Facchi*  

Point Cloud based Hierarchical Deep Odometry Estimation  
*Farzan Erlik Nowruz, Dhanvin Kolhatkar, Prince Kapoor and Robert Laganiere*  

Study of Stability through Lyapunov Theory and Passivity following a FDI on a Velocity Control System  
*M. Ruhnke, X. Moreau, A. Benine Neto, M. Moze, F. Aioun and F. Guillemard*
A Reinforcement Learning Approach for Traffic Control

Urs Baumgart and Michael Burger

Effects on Traffic Performance Due to Heterogeneity of Automated Vehicles on Motorways: A Microscopic Simulation Study

Ivan Postigo, Johan Olstam and Clas Rydbergren

Urban Traffic Incident Detection for Organic Traffic Control: A Density-based Clustering Approach

Ingo Thomsen, Yannick Zapfe and Sven Tomforde

Comparison of Camera-Equipped Drones and Infrastructure Sensors for Creating Trajectory Datasets of Road Users

Amarin Kloeker, Robert Krajewski and Lutz Eckstein


Lam Duc Nguyen, Amari N. Lewis, Israel Leyva-Mayorga, Amelia Regan and Petar Popovski

A Comparison of Lateral Intention Models for Interaction-aware Motion Prediction at Highways

Vinicius Trentin, Antonio Artuñedo, Jorge Godoy and Jorge Villagra

Ride-hailing Emissions Modeling and Reduction through Ride Demand Prediction

Tanmay Bansal, Ruchika Dongre, Kassie Wang and Sam Fuchs

Pixel Invisibility: Detect Object Unseen in Color Domain

Yongxin Wang and Duminda Wijesekera

Deep Learning Classifiers for Automated Driving: Quantifying the Trained DNN Model’s Vulnerability to Misclassification

Himanshu Agarwal, Rafal Dorociak and Achim Rettberg

Feature-based Analysis of the Energy Consumption of Battery Electric Vehicles

Patrick Petersen, Aya Khdar and Eric Sax

A Dependency-based Combinatorial Approach for Reducing Effort for Scenario-based Safety Analysis of Autonomous Vehicles

Kaushik Madala, Hyunsook Do and Carlos Avalos-Gonzalez

Estimation of the Acoustic Waste Energy Harvested from Diesel Single Cylinder Engine Exhaust System

Claudiu Golgot, Nicolae Filip and Lucian Candale

SHORT PAPERS

Vocation Identification for Heavy-duty Vehicles: A Tournament Bracket Approach

Daniel Kobold Jr., Andy Byerly, Rishikesh Mahesh Bagwe, Euzeli Cipriano dos Santos Jr. and Zina Ben Miled

Road Traffic Anomaly Detection based on Deep Learning Technology

Jamal Raiyn

A Two-stage Learning Approach for Traffic Sign Detection and Recognition

Ying-Chi Chiu, Huei-Yung Lin and Wen-Lung Tai

Driving Behavior Analysis and Traffic Improvement using Onboard Sensor Data and Geographic Information

Jun-Zhi Zhang and Huei-Yung Lin

XII
Non-linear Motorcycle Dynamic Model for Stability and Handling Analysis with Roll Motion and Longitudinal Speed Regulation
Vincenzo Maria Arricale, Renato Brancati, Francesco Carputo, Antonio Maiorano and Guido Napolitano Dell’Annunziata

A Systematic Approach of Reduced Scenario-based Safety Analysis for Highly Automated Driving Function
Marzana Khatun, Michael Glaß and Rolf Jung

 Autonomous Braking and End to End Learning using Single Shot Detection Model and Convolutional Neural Network
Marwan Elkholy, Kirollos Nagy, Mario Magdy and Hesham H. Ibrahim

Functional Safety and Electric Vehicle Charging: Requirements Analysis and Design for a Safe Charging Infrastructure System
Tommi Kivelä, Mohamed Abdelawwad, Marvin Sperling, Malte Drabes, Michael Schwarz, Josef Börsök and Kai Furmans

Health Monitoring of Automotive Suspension System using Machine Learning
Ahmed Abdelfattah and Hesham Ibrahim

An Intelligent Transportation System for Air and Noise Pollution Management in Cities
Mariam Osama Zaky and Hassan Soubra

Value Networks and Monetization Strategies for C-ITS Safety Use Cases
Pol Camps-Aragó, Simon Delaere and Ruben D’Hauwers

Collective Perception: Impact on Fuel Consumption for Heavy Trucks
Juergen Hauenstein, Jakob Gromer, Jan Cedric Mertens, Frank Diermeyer and Sven Kraus

The Forerunner UAV Concept for the Increased Safety of First Responders
Mihály Nagy, Péter Bauer, Antal Hiba, Attila Gáti, István Drotár, Balázs Lattes and Ádám Kisari

User Experience and Analysis of an Autonomous Shuttle Service
Lova Andersson, Allegra Ayala, Shuan Chan, Kyle Hickerson, Liam Kettle, Lindsey A. Malcein and Yi-Ching Lee

A Cooperative Platooning Controller for Connected Vehicles
Youssef Bichiou, Hesham Rakha and Hossam M. Abdelghaffar

Online State Estimation for Microscopic Traffic Simulations using Multiple Data Sources
Kevin Malena, Christopher Link, Sven Mertin, Sandra Gausemeier and Ansgar Trächtler

Analytical Approaches for Fast Computing of the Thermal Load of Vehicle Cables of Arbitrary Length for the Application in Intelligent Fuses
Anika Henke and Stephan Frei

The Perception Modification Concept to Free the Path of An Automated Vehicle Remotely
Johannes Feiler and Frank Diermeyer

Farzan Erlik Nowruzi, Dhanvin Kolhatkar, Prince Kapoor, Elnaz Jahan Heravi, Fahed Al Hassanat, Robert Laganiere, Julien Rebut and Waqas Malik

Car Drivers Do Not Choose Their Speed in Urban Environments: Speed Models in Tangent Streets
Yasmany García-Ramírez, Luis Paladines, Christian Verdesoto and Patricio Torres
A Self-organising System Combining Self-adaptive Traffic Control and Urban Platooning: A Concept for Autonomous Driving
Heiko Hamann, Julian Schwarzat, Ingo Thomsen and Sven Tomforde

429

A Piecewise Linearization Algorithm for Solving MINLP in Intersection Management
Mathias Gerdts, Sergejs Rogovs and Giammarco Valenti

438

Systems-theoretic Safety Assessment of Teleoperated Road Vehicles
Simon Hoffmann and Frank Diermeyer

446

Vegetation Detection in UAV Imagery for Railway Monitoring
Md Atiqur Rahman and Abdelhamid Mammeri

457

What Does Visual Gaze Attend to during Driving?
Mohsen Shirpour, Steven S. Beauchemin and Michael A. Bauer

465

Capturing the Variety of Urban Logical Scenarios from Bird-view Trajectories
Christian King, Thilo Braun, Constantin Braess, Jacob Langner and Eric Sax

471

Traffic Congestion “Gap” Analysis in India
Tsutomu Tsuboi and Tomoaki Mizutani

481

Detecting Message Modification Attacks on the CAN Bus with Temporal Convolutional Networks
Irina Chiscop, András Gazdag, Joost Bosman and Gergely Biczók

488

A Full-Featured, Enhanced Cost Function to Mitigate Motion Sickness in Semi- and Fully-autonomous Vehicles
Isa Moazen and Paolo Burgio

497

A Survey of UAS Technologies to Enable Beyond Visual Line Of Sight (BVLOS) Operations
Elena Politi, Ilias Panagiotopoulos, Iraklis Varlamis and George Dimitrakopoulos

505

Strategic Coordination of Cooperative Truck Overtaking Maneuvers
Jan Cedric Mertens, Jürgen Hauenstein, Frank Diermeyer and Andreas Zimmermann

513

Let It Crash! Energy Equivalent Speed Determination
Pavlína Moravcová, Kateřina Bucsházy, Martin Bilík, Michal Belák and Albert Bradač

521

A Practical Evaluation Method for Misbehavior Detection in the Presence of Selfish Attackers
Marek Wehmer and Ingmar Baumgart

529

Ambulance Vehicle Routing under Pandemic with Fuzzy Cooperative Game via Smart Contracts
Alexander Smirnov and Nikolay Teslya

538

Colorimetric Space Study: Application for Line Detection on Airport Areas
Claire Meymandi-Nejad, Esteban Perrotin, Ariane Herbulot and Michel Devy

546

Evaluating Message Size of the Collective Perception Message in Real Live Settings
Michael Klöppel-Gersdorf and Thomas Otto

554

Establishing End-to-End Secure Channel for IoT Devices through an Untrusted C-ITS Network
Simon Bouget, Shahid Raza and Martin Furuhed

562

A Review on Charging Systems for Electric Vehicles in Smart Cities
Mohamed A. Abd El Ghany

571
Evaluation of Passenger Car Emission Indexes in Relation to Passing through the Rail-road Crossing
Mateusz Nowak, Maciej Andrzejewski, Sylwia Tomaszewska, Paweł Daszkiewicz and Patryk Urbański

Generation of Road Reference Heading using GPS Trajectories for Accurate Lane Departure Detection
Shahnawaz Chowdhury, Md. Touhid Hossain and M. I. Hayee

A Flexible Scheduling Architecture of Resource Distribution Proposal for Autonomous Driving Platforms
Hadi Askaripoor, Sina Shafaei and Alois Knoll

Accelerating Interference-based QoS Analysis of Vehicular Ad Hoc Networks for BSM Safety Applications: Parallel Numerical Solutions and Simulations
Jing Zhao, Hao Zhou, YanBin Wang, HuaLin Lu, Zhijuan Li and XiaoMin Ma

A Comprehensive View of Intelligent Transport Systems and Supply Chain Management for CIS Countries
Onur Gavenc

Transit Performance Evaluation at Signalized Intersections of Bus Rapid Transit Corridors
Robel Desta, Tewodros Dubale and János Tóth

Requirements for a Cybersecurity Case Approach for the Assurance of Future Connected and Automated Vehicles
Luis-Pedro Cobos, Alastair R. Ruddle and Giedre Sabaliauskaite

Collection of Requirements and Model-based Approach for Scenario Description
Thilo Braun, Lennart Ries, Franziska Körtke, Lara Turner, Stefan Otten and Eric Sax

Resolving Confusion of Unknowns in Autonomous Vehicles: Types and Perspectives
Kaushik Madala and Hyunsook Do

The Need for Location-based Machine Learning Models for Level 5 Automated Vehicles
Kaushik Madala and Hyunsook Do

Wireless Power Transfer with Data Transfer Capability for Electric and Hybrid Vehicles: State of the Art and Future Trends
Sami Barmada, Nunzia Fontana and Mauro Tucci

Explainable Federated Learning for Taxi Travel Time Prediction
Jelena Fiosina

Detection, Estimation & Tracking Road Objects for Assisting Driving
Afnan Alshkeili, Wenliang Qiu and Bidisha Ghosh

A Novel Approach of Environment Impact Assessment and Emission Measurement on the Inter-city Transportation in the Greater Bay Area (GBA) of China using a Modified Gravity Model
Eugene Yin Cheung Wong, Danny Chi Kuen Ho, Stuart So, Eve Man Hin Chan and Chi-Wing Tsang

Multi-MNO Predictive-QoS for Vehicular Applications
Prachi Mittal and Tim Leinmüller

Safety-configuration of Autonomous Bus in Pedestrian Zone
Qazi Hamza Jan and Karsten Berns

Towards a Natural Language Dialog System for Mobility Service Platforms
David Thulke, Felix Schwinger and Karl-Heinz Krempels
Study of Parameter Influence of the Basic Cylinder of Rotary Screw Propulsion Units on Noise Level during Locomotion on Ice  
Umar Vahidov, Dmitriy Mokerov, Roman Dorofeev, Vladimir Belyakov, Vladimir Makarov and Yuri Molev

Towards a Rule-based Approach for Estimating the Situation Difficulty in Driving Scenarios  
Maximilian Schukraft, Susanne Rothermel, Juergen Luettin and Lavdim Halilaj

SPECIAL SESSION ON INTELLIGENT MOBILITY, LOGISTICS AND TRANSPORT

FULL PAPERS

Subcycle-based Neural Network Algorithms for Turning Movement Count Prediction  
Yashaswi Karnati, Rahul Sengupta, Anand Rangarajan and Sanjay Ranka

Monitoring of Transport Flow Emissions based on the Use of Convolutional Neural Networks  
A. I. Glushkov, V. D. Shepelev, S. D. Shepelev, K. A. Magdin, I. Slobodin, A. Burzev and V. G. Mavrin

The Estimation of Traffic Flow Parameters based on Monitoring the Speed Values using Computer Vision  
V. D. Shepelev, A. I. Vorobyev, E. V. Shepeleva, I. D. Alferova, N. Golenaev, G. Yakupova and V. G. Mavrin

SHORT PAPERS

Ensuring Reliability of Transfer Gearbox  
Irina Makarova, Larisa Gabsalikhova, Eduard Mukhametdinov, Ruslan Kazantsev, Polina Buyvol, Aleksandr Kapitonov and Alexandr Glushkov

Ensuring Reliability of the Gearbox during Operation Stage  
Irina Makarova, Eduard Mukhametdinov, Larisa Gabsalikhova, Vladimir Shepelev, Shamil Galiev, Polina Buyvol and Maria Drakaki

Prospects to Development of Green Technologies for Alternative Motor Fuel’s Production  
Larysa Gabacheva, Darya Chizhevsksaya and Irina Makarova

System Approach to Ensuring the Safety of Modern Vehicles  
Irina Makarova, Gulnara Yakupova, Vladimir Shepelev, Polina Buyvol, Eduard Mukhametdinov, Aleksandr Barinov and Albert Abashev

AUTHOR INDEX