

about the event can be found in the Preface of the conference proceedings at the following DOI.

The conference was organized as part of Széchenyi István University's VHFO/416/2023-EM_SZERZ project, titled "Preparation of digital environmental infrastructure developments and related research to reduce carbon emissions and environmental impact" (Green Traffic Cloud).

Audi
Hungaria



Program Schedule

Day 1, 14 Oct 2024 Monday

08:00 - 09:00: Registration Science Park		
09:00 - 11:10: Plenary session Science Park, Moderated by Bariska Szilárd Opening and Welcome Speech Author(s): Prof. Dr. József Bokor, (Széchenyi István Egyetem), 14 Oct 2024, 9:00 - 9:10 Automotive Industry Today and Tomorrow Author(s): Dr. István Szászi, (Robert Bosch Kft.), 14 Oct 2024, 9:10 - 9:40 Engine Project Support Author(s): Dr. Gábor Gubicza and Silvio Biasi, (Audi Hungaria Zrt.), 14 Oct 2024, 9:40 - 10:10 The Contribution of Climate Fuels to the transition of Road Traffic Author(s): Prof. Thomas Garbe, (Volkswagen AG), 14 Oct 2024, 10:10 - 10:40 Scalable Methods for Verifying Autonomous Cyber-Physical Systems Author(s): Prof. Rahul Razdan (Florida PolyTechnic University) 14 Oct 2024, 10:40 - 11:10		
11:30 - 12:50: Session #1 <u>Vehicle Development I.</u> Management Campus, Room 122, Chair: Dr. Balázs Vehovszky Gearbox Fault Diagnosis Using Industrial Machine Learning Techniques Author(s): Horváth K., Zelei A., 14 Oct 2024, 11:30 - 11:50 Automated Assessment of Engine Performance During Dynamometer Testing Author(s): Koller T., Tóth-Nagy Cs., 14 Oct 2024, 11:50 - 12:10 Laser textured surface simulation applied to piston rings in AVL Excite	11:30 - 12:50: Session #1 <u>Materials Technology I.</u> Management Campus, Room 227, Chair: Dr. Hargitai Hajnalka Development of Aluminum and Copper Alloys for Electric Automotive Engines – from the Research Work at the University of Dunaújváros Author(s): Pázmán J., 14 Oct 2024, 11:30 - 11:50 Comparative Evaluation of Forming Limit Curve Models for AlMg Alloys Author(s): Harangozó D., Czinege I., 14 Oct 2024, 11:50 - 12:10 Effect Analysis of Machining Errors of Axle Wheel Hub Planet Carrier on Function and Durability-related Parameters	11:30 - 12:50: Session #1 <u>Autonomous Vehicle Development</u> Management Campus, Room 228, Chair: Dr. Razdan Overview Study of the Application of Aerial Vehicles in the Transport Author(s): Kiss B., Ballagi Á., Kuczsné, 14 Oct 2024, 11:30 - 11:50 Efficiency Analysis of Kolmogorov–Zurbenko for Visual Data Processing Author(s): Hollósi J., 14 Oct 2024, 11:50 - 12:10 Innovative Cone Clustering and Path Planning for Autonomous Formula Student Race Cars

Author(s): Tóth-Nagy Cs., 14 Oct 2024, 12:30 - 12:50	Molded Materials: Insights from SEM, EDS, and Metallographic Analysis Author(s): Ledniczky Gy., Tajti F., Marokhazi S., Weltsch Z., 14 Oct 2024, 12:30 - 12:50	Vehicles on Transport, their Cross-Relationships between In Author(s): Csikor D., Szauder F., Kot 2024, 12:30 - 12:50
13:40 - 15:20: Session #2 <u>Vehicle Development II.</u> Management Campus, Room 122, Chairs: Silvio Biasi, Dr. Gubicza Gábor Sensitivity to geometric Detail in Fatigue Simulation of Electronic Components of Vehicles Author(s): Kovács Z., Zelei A., 14 Oct. 2024, 13:40 - 14:00 Parameter-Driven Campbell Diagram Variations in Turbocharger Rotors: A Rotordynamic Simulation Study using ROSS Author(s): Pesthy M., Boros M., Tóth-Nagy Cs., 14 Oct. 2024, 14:00 - 14:20 Investigation of Gas Blow-by through the Turbocharger Sealing Ssystem using Advanced Computational Simulations Author(s): P. Novotný, J. Vacula, P. Kudláček, F. Kocman, 14 Oct. 2024, 14:20 - 14:40 Performance Optimization of a Formula Student Racing Car Using IPG CarMaker – Part 1: Lap Time Convergence and Sensitivity Analysis Author(s): Takács D., Zelei A., 14 Oct. 2024, 14:40 - 15:00 Performance Optimization of a Formula Student Racing Car Using IPG CarMaker – Part 2: Aiding Aerodynamics and DRS Package Design Author(s): Takács D., Zelei A., 14 Oct. 2024, 15:00 - 15:20	13:40 - 15:20: Session #2 <u>Materials Technology II.</u> Management Campus, Room 227, Chair: Dr. Zsoldos Ildó The Effect of Wood Flour Incorporation on the Properties of Injection Molded Poly(lactic acid) Products Author(s): Jakab S. K., Bódi V. L., Lendvai L., 14 Oct. 2024, 13:40 - 14:00 Testing sustainable 3D Printed Battery Housings with DIC Technology Author(s): Szívós B. F., Nemes V., Szalai Sz., Fischer Sz., 14 Oct. 2024, 14:00 - 14:20 CT Based Defect Analysis in Aluminium Rotor End Rings Author(s): Kozma I., Zsoldos I., 14 Oct. 2024, 14:20 - 14:40 Foam Injection Molding of Poly(lactic acid) with Azodicarbonamide-based Chemical Blowing Agent Author(s): Lendvai L., Dogossy G., Jakab S. K., Fekete I., 14 Oct. 2024, 14:40 - 15:00 Sustainable Uses of 3D Printing applied to Concrete Structures Author(s): Csótár H., Baranyai G., Szalai Sz., Fischer Sz., 14 Oct. 2024, 15:00 - 15:20	13:40 - 15:20: Session #2 <u>Autonomous Vehicles</u> Management Campus, Room 228, János Inverse Perspective Mapping Correction for Camera-based Autonomous Driving Author(s): Markó N., Kőrös P., Ungvári Z., 2024, 13:40 - 14:00 Exploration Techniques in Reinforcement Learning for Autonomous Vehicle Navigation Author(s): A. Khaleel, Ballagi Á., 14 Oct. 2024, 14:00 - 14:20 Assessment of LiDAR and Camera-based Methods in Monochromatic Environments Author(s): Krecht R., Ballagi Á., 14 Oct. 2024, 14:20 - 14:40 Teaching Aspects of ROS 2 and Autonomous Navigation Author(s): Horváth E., Ignécz G., Magyar M., Unger M., 14 Oct. 2024, 14:40 - 15:00 A Novel Method to Improve the Performance of Cloud-based Navigation Author(s): O. M. Salih, H. Rostum, 14 Oct. 2024, 15:00 - 15:20
15:50 - 17:30: Session #3 <u>Diagnostics & Testing I.</u> Management Campus, Room 122, Chair: Dr. Pokorádi László Examination of the Load's Effect on Fuel Consumption and CO2 Emissions, in the Case of a Diesel and LNG Powered Engine Author(s): Baráth B., Jagicza M., Sütheő G., Tóth G. L., 14 Oct. 2024, 15:50 - 16:10 Theoretical Study of the Effect of Weather Conditions on Vehicle Aerodynamic Properties	15:50 - 17:30: Session #3 <u>Materials Technology III.</u> Management Campus, Room 227, Chair: Dr. Lendvai László The Relationship Between Machining Technology Parameters and Surface Roughness in scope of the optimal cost efficiency of machining Author(s): Pálfi L., József Beke J., Szalai Sz., 14 Oct. 2024, 15:50 - 16:10 Electrical Conductivity Behavior of Rubber Composites Based on SBR Under Cyclic Mechanical Deformation	15:50 - 17:30: Session #3 <u>Engineering Design</u> Management Campus, Room 228, András Lajos Reinforcement learning-based robust navigation for autonomous vehicle trajectory optimization Author(s): Lelkó, 14 Oct. 2024, 15:50 - 16:10 The Future Role of Smart Devices in Urban Concentrated Load Scenarios Author(s): Bóna K., Dávid Sárdi I., Domancsik V., 14 Oct. 2024, 16:10 - 16:30

Law-abiding „Behavior“ of Self-driving Vehicles Author(s): Pődör L., Lakatos I., 14 Oct. 2024, 16:30 – 16:50 Predictive Maintenance and Predictive Repair of Road Vehicles – their Opportunities, Limitations and Practical Application Author(s): Nagy J., Lakatos I., 14 Oct. 2024, 16:50 – 17:10 Prevalence and Characteristics of Traffic Accidents Endangering Vulnerable Pedestrians in Hungary Author(s): Sánta E., Szűcs P., Patocskaï D., Lakatos I., 14 Oct. 2024, 17:10 – 17:30	Formation of Chemically Modified PET Blends Author(s): Szabó V., Böcz G., Dogossy G., 14 Oct. 2024, 16:30 – 16:50 Effect of Reprocessing on the Viscosity and Mechanical Properties of PLA and PLA/MMT Nanocomposites Author(s): Z. Taha Taha, Ádámné M. A., Ronkay F., 14 Oct. 2024, 16:50 – 17:10	Complex investigation of the effect of ZnO nanoparticles on the tribological properties of thermally aged Group III base oils Author(s): Szabó, 14 Oct. 2024, 16:50 – 17:10 Hydrogen Engine Conversion Author(s): Sipos G., Bukovác K., Sebestyén L. Á., 14 Oct. 2024, 17:10 – 17:30 Unified Methodology for Conversion of Remote-Controlled Systems Author(s): Kecskeméti I., 14 Oct. 2024, 17:10 – 17:30
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Day 2, 15 Oct 2024 Tuesday

08:00 – 09:00: Registration Science Park		
09:00 – 11:10: Plenary session Science Park, Moderated by Prof. Dr. habil. Dogossy Gábor Carbon-free energy carriers – Impact of ammonia on engine oil performance Author(s): Dr. Nicole Dörr (Austrian Excellence Center for Tribology), 15 Oct 2024, 9:00 – 9:30 Road, Traffic and Environmental Factors in the Operational Design Domain of Lidar and Vision based lane keeping systems Author(s): Prof. Salvatore D. Cafiso (Università di Catania), 15 Oct 2024, 9:30 – 10:00 Understanding the shifting paradigm of cyber-physical systems Author(s): Dr. Horváth Imre (Delft University of Technology), 15 Oct 2024, 10:00 – 10:30 Charging technology and Energy hubs Author(s): Dr. Pavol Bauer (Delft University of Technology), 15 Oct 2024, 10:30 – 11:00		
11:30 – 12:50: Session #1 <u>Diagnostics & Testing II.</u> Management Campus, Room 122, Chair: Dr. Perger József Investigation of Tooth Friction Conditions of an Electric Vehicle Gearbox with Plastic Gears Author(s): Polák J., 15 Oct 2024, 11:30 – 11:50 Design Considerations for a Low-Voltage Scalable Battery Test Laboratory Author(s): Szakallas G., Lakatos I., 15 Oct 2024, 11:50 – 12:10 Vehicle in the Loop testing of Traffic Sign Recognition System	11:30 – 12:50: Session #1 <u>Fuels & Lubricants</u> Management Campus, Room 227, Chair: Dr. Nicole Dörr, Dr. Thomas Garbe Tribological Investigation of Base Oil Supplemented with Zirconia Nanoparticles at Various Operating Temperatures Author(s): Szabó Á. I., Marsicki M., 15 Oct 2024, 11:30 – 11:50 Optimizing Experimental Design to Determine Friction and Wear Characteristics of Used Oil Contaminated with E20 Fuel Author(s): Pintér D., Nagy A. L., 15 Oct 2024, 11:50 – 12:10	11:30 – 13:10: Session <u>Transportation & Logistics</u> Management Campus, Room 228, Chair: Dr. Damiano Cafiso Safety assessment of pedestrian-vehicle interaction using automated video analytics statistical tools Author(s): A. Kizawi, Borsos A., 15 Oct 2024, 11:50 Mapping IT and Management Challenges of Micro Businesses: A Path to Digital Manufacturing Author(s): Tápler Cs., 15 Oct 2024, 11:50

Autonomous Vehicles Using Inertial Roadway Sensors Author(s): Molnár B., Kun K., 15 Oct 2024, 12:30 - 12:50	Author(s): Tóth A. D., Szabó A. I., 15 Oct 2024, 12:30 - 12:50 Validation of the Optimal Points of Tribological Systems at Different Temperatures Determined by DOE Method Using Lubricating Oil Doped with Nano-ZrO₂ Particles Author(s): Szabó Á. I., Szabó K., 15 Oct 2024, 12:30 - 12:50	Author(s): Borsos A., 15 Oct 2024, 12:30 - 13:10 Analyzing the Potential Impact of Compliance Behavior of Autonomous Vehicles Author(s): Borsos A., Horváth B., Nagy Z., 15 Oct 2024, 12:30 - 13:10 The Impact of Organizational Resilience on Traffic Safety Author(s): Orbán J., Szabó Gy., 15 Oct 2024, 13:10
12:50 - 13:40: Is the honeymoon over? The limits of applied AI Management Campus Ground Floor Hall, Chair: Péter Rácz (Bosch)		
13:40 - 15:20: Session #2 <u>Diagnostics & Testing III.</u> Management Campus, Room 122, Chairs: Dr. Harth Péter Nonlinear Identification of Lateral Dynamics of an Autonomous Car Vehicle Author(s): Pup D., Istenes Gy., Szauter F., Bokor J., 15 Oct. 2024, 13:40 - 14:00 Hammerstein Model Identification for Autonomous Vehicle Dynamics by Two-Stage Algorithm Author(s): Istenes Gy., Pup D., Terdik Gy., Bokor J., 15 Oct. 2024, 14:00 - 14:20 Development of a Diagnostic Procedure for Vehicle's Built-in Electric Motors Author(s): Baráth B., Jagicza M., Józsa D., Tóth G. L., 15 Oct. 2024, 14:20 - 14:40 Automatized Driving Data Analyzer: A Synchronized and Modular Application for Data Logging and Analysis Author(s): Sándor Á. P., Nagy V., 15 Oct. 2024, 14:40 - 15:00 Personal Watercraft Remote Control Communication Fault Detection Author(s): Titrik Á., 15 Oct. 2024, 15:00 - 15:20	13:40 - 15:20: Session #2 <u>Electromobility I.</u> Management Campus, Room 227, Chair: Dr. Ravio Sell LQ Robust Control of Synchronous Reluctance Motor Author(s): Bányai D. G., Németh Z., 15 Oct. 2024, 13:40 - 14:00 Comparative Analysis of Field Oriented Control and Direct Torque Control through Simulation in MATLAB Simulink for an Automotive Drive Motor Author(s): Simon M. G., Fodor D., 15 Oct. 2024, 14:00 - 14:20 Performance Comparison of the General the Dual and the Joint Sigma Point Kalman Filter on State Estimation of Li-ion Battery Cells for BMS Author(s): Horváth T., Fodor D., 15 Oct. 2024, 14:20 - 14:40 Comprehensive Analysis of the Factors Affecting the Energy Efficiency of Electric Vehicles and Methods to Reduce Consumption: A Review Author(s): Saly G., Szauter F., Kocsis Szürke. Sz., 15 Oct. 2024, 14:40 - 15:00 Performance Analysis of Position Estimation and Correction Methods Author(s): Enisz K., Horváth E., Markó N., Szeli Z., Pázmány J. G., 15 Oct. 2024, 15:00 - 15:20	13:40 - 15:20: Session #2 <u>Mobility & Society I.</u> Management Campus, Room 228, Chairs: Dr. Bevanda, Dr. habil. Boglárka Eisi Advancing Towards Sustainable Retail: The Role of AI-Driven Consumer Segmentation Author(s): G. Sakaline, Buics L., 15 Oct. 2024, 13:40 - 14:00 The Evolution of Digitalization Transition in the Industry 4.0 in Supply Chain Management: A Systematic Literature Review Author(s): N. N. Quynh Tran, Buics L., 15 Oct. 2024, 14:00 - 14:20 Digital Twins in Sustainable Supply Chain Management: A Comprehensive Review on Current Trends and Enablers for Successful Adoption Author(s): Bandara et al., 15 Oct. 2024, 14:20 - 14:40 Tailoring manager's journey to digital transformation of SMEs Author(s): V. Bevanda, 15 Oct. 2024, 14:40 - 15:00 Traffic Prediction Based on Online Vehicle Position Information for Simulation, Validation and Resource Allocation Purposes Author(s): Jáger R. A., Szabó G., 15 Oct. 2024, 15:00 - 15:20
15:50 - 17:30: Session #3 <u>Electromobility II.</u> Management Campus, Room 122, Chair: Dr. Szabó Lóránd Resource Effective, Self-Addressing Method for Wired IOT Sensor Matrix Author(s): Csernáth et al., 15 Oct. 2024, 15:50 - 16:10	15:50 - 17:30: Session #3 <u>AI & Control</u> Management Campus, Room 227, Chair: Dr. Horváth Imre Review of Vehicle Motion Planning and Control Techniques to Reproduce Human-like Curve Driving Behavior	15:50 - 17:30: Session #3 <u>Management</u> Management Campus, Room 228, Chairs: Dr. Poyda-Nosyk, Dr. Nikolett Gyöngyösi Consumer Perceptions in the Alternative Market: A Systematic Literature Bibliometric Analysis

Author(s): D. Fodorean, Kertész N., D.C. Fopá, L. Bacali, L. Szabó, 15 Oct. 2024, 16:10 – 16:30 Study of a 7.5 kW & 18000 r/min Synchronous Reluctance Motor for Fuel Cell Compressor Application Author(s): M.-S. Derban, D. Fodorean, 15 Oct. 2024, 16:30 – 16:50 Insulated Hybrid Grid Based on PV System, Battery and Fuel Cell Car – A Case Study Author(s): L. A.C. Ciochinda, D. Fodorean, 15 Oct. 2024, 16:50 – 17:10 Advances and Future Trends in Battery Management Systems Author(s): Kertész N., Szabó L., 15 Oct. 2024, 17:10 – 17:30	Autonomy Applications Author(s): M. Malayjerdi, R. Sell, E. Malayjerdi, M. İlhan Akbaş, R. Razdan, 15 Oct. 2024, 16:10 – 16:30 A Long Short-Term Memory Based Deep LearningDigital Ttwin of a Li-ion Cell for Battery SOC Estimation Author(s): Lennert J. R., Fodor D., 15 Oct. 2024, 16:30 – 16:50 Design of Gain Scheduled Lateral Controllers for Autonomous Vehicles Author(s): Bokor Á., Szabó Á., Aradi Sz., Palkovics L., 15 Oct. 2024, 16:50 – 17:10 Data-Driven Engine Health Monitoring with AI Author(s): Hornyák O., 15 Oct. 2024, 16:50 – 17:10	in Sustainable Urban Mobility. A Systematic Literature Review and Stakeholder Analysis Author(s): Buics L., A. Prayogo, Eisn, 15 Oct. 2024, 16:10 – 16:30 Driving Examiner’ Perceptions and Advanced Driver Assistance System Based Analysis Author(s): Eisinger B. B., Koteczki Réka, 15 Oct. 2024, 16:30 – 16:50 Strategic Development Trends in the Automotive Industry of Ukraine Author(s): Poyda-Nosyk et al., 15 Oct. 2024, 16:50 – 17:10 Towards Predicting Business Activity in the European Digital Corporate Governance Author(s): Molnár P., Suta A., Lukács Z., 15 Oct. 2024, 17:10–17:30
19:00: Gala Dinner Management Campus, Ground Floor Hall		

Day 3, 16 Oct 2024 Wednesday

08:30 - 09:30: Registration Science Park		
09:30 - 11:00: Plenary session Science Park, Moderated by Prof. Dr. habil. Dogossy Gábor Physical Characteristics of Motorsport Drivers Author(s): Prof. Dr. Kevin J. Finn (University of Central Missouri), 16 Oct 2024, 9:30 – 10:00 Integrated sensors for e-drive control Author(s): Dr. Dirk Hammerschmidt (Infineon Technologies), 16 Oct 2024, 10:00 – 11:00		
11:00 - 12:40: Session #1 <u>Mobility & Society II.</u> Management Campus, Room 122, Chairs: Dr. Stefan Ugrinov, Dr. László Buics Motorcycle/Donorcycle: Improving Motorcyclist Safety in Győr, Hungary	11:00 - 12:40: Session #1 <u>Electromobility III.</u> Management Campus, Room 227, Chair: Christof Michenthaler Evaluating the Effectiveness of Autorouting in PCB Design	11:00 - 12:40: Session #1 <u>Motorsport & Health</u> Management Campus, Room 228, Chair: Dr. Kevin J. Finn Lessons Learned from an Autonomous Vehicle Competition

Author(s): S. Ugrinov, D. Čočkaló, E. Terek S., S. Stanisavljev, M. Bakator, V. Gluvakov, 16 Oct 2024, 11:20 - 11:40 A Systematic Review of Urban Mobility and a Preliminary Research of Hungarian Transportation Trends in West-Hungary Author(s): Vastag T., Lőrincz F., 16 Oct 2024, 11:40 - 12:00 How Perceptual Variables Influence the Behavioral Intention to Use Autonomous Vehicles Author(s): Koteczki et al., 16 Oct 2024, 12:00 - 12:20 Learning Factories in Practice: The Example and Development proposal of Mini Company located in the Automotive Science Park based on international best Practices Author(s): Szabó D., Csikós Ft., Kollár V., Kovács I., 16 Oct 2024, 12:20 - 12:40	Author(s): Májer J., Fodor D., Nagy F. T., Németh B. I., P. Panyi, 16 Oct 2024, 11:20 - 11:40 Embedded System Simulation Using Renode Author(s): Speiser F., Szalay I., Fodor D., 16 Oct 2024, 11:40 - 12:00 Induction Motor Energy Efficiency Investigation Author(s): Szénásy I., Csikor D., 16 Oct 2024, 12:00 - 12:20 Driving Strategy Optimization in Experimental Electric Vehicles: A Study on Optimization Algorithms Author(s): Pusztai Z., Szauter F., Friedler F., 16 Oct 2024, 12:20 - 12:40	Author(s): Kerner L., Ihász F., Alföldi Katona B. Zs., 16 Oct 2024, 11:40 - 12:00 Localization Challenges in the F1 Motorsport Author(s): Kail B., Papp Zs., Fazekas 11:40 - 12:00 Examination of psychological elements of motocross rider (MX) athletes Author(s): Alföldi Z., 16 Oct 2024, 12:00 - 12:20 Research of the physiological changes of successful and less successful young motocross racers Author(s): Pápai A., 16 Oct 2024, 12:20 - 12:40 Heart rate pattern analysis among motocross (MX) racers Author(s): Ihász F., 16 Oct 2024, 12:40 - 13:00
12:40: Lunch and Goodbye Management Campus, Ground Floor Hall 13:00: Lunch and Goodbye Management Campus, Ground Floor Hall		