3rd International Conference on Cognitive Mobility
at Bosch Innovation Campus, Budapest

7th October 2024

8:30-9:00	Registration
9:00-9:10 Auditorium	**Opening** Prof. Máté Zöldy / András Kemler Bosch / Tamás Zentai Energotest
9:10-11:00 Auditorium	**Plenary Lectures** Dr. Marko Babic: Digital Fuel Twin in practice Prof. Dr. Barna Hanula: The potential of intelligent vehicle control and traffic management for energy consumption Prof. Dr. Dhinesh Balasubramanian: Enhancing Safety in Hydrogen Mobility: Data-driven Prediction of Leaks Csongor Horváth: Analysis of development trends in the electric powertrain sector
	Session Chair: Prof. Ádám Török

11:00-11:20 — Coffee Break

11:20-12:50 Auditorium	Parallel Session I.			11:20-12:50 VIP 1 room	Parallel Session II.			11:20-12:50 VIP 2 room	Parallel Session III. (video session)
Session: Pedestrian mobility				**Session: Intelligent logistics**				**Session: Cognitive networks and their intelligent capabilities**	
Session Chair: Prof. Melih Yildiz				**Session Chair: Prof. Dr. Szabolcs Fischer**				**Session Chair: Prof. Ádám Török**	
7	Emese Mako and Zhiger Kurmangaliyev	Evaluating stakeholder opinion on traffic engineering devices to improve pedestrian crossing safety around small village schools		25	Zsolt Berki and Áron Bede	Rail freight route choice and costing model for transport modelling		5	Furkan Kaya, Şevket Aslan, Mohammad Fahad, Klaudia Madarász, et al	The Usability of Polymethyl Methacrylate in Marshall Samples for Asphalt Pavements Using in Railway Supplementary Layers
9	Ziyad N. Aldoski and Csaba Koren	Standardized Assessment, LiDAR-Based Measurements, and Human Perception of Traffic Signs		82	Andrej Dávid, Andrei-Angelo Midan, Maciej Klosak and Yasser Douimia	Sustainability of inland water transport on the Rhine-Main-Danube Waterway		11	András Brautigam, Dóra Harangozó, Mykola Sysyn, Dmytro Kurhan and Szabolcs Fischer	Field Application of Austenitic Filler Metals for Repairing Rail Surface Defects in Paved Tracks
12	Nóra Krizsik and Tibor Sipos	The Role of Cognitive Skills in Human-Vehicle Interactions at Designated Pedestrian Crossings		57	Petra Molnár-Major and Máté Zöldy	Investigation of path planning algorithms using artificial intelligence in intralogistics		21	Olga Nabochenko, Mykola Sysyn and Szabolcs Fischer	Void geometry identification with track-side rail deflection measurements
13	Gabriella Kosztolányi-Iván, Csaba Koren and Bayasgalan Nemekh	Where do pedestrians look, when crossing suburban railway lines with right- and left-hand traffic?		79	Abdulhamit Sevgi, Alpaslan Durmuş and Ahmet Murat Kadioğlu	Using of Robotic Systems in Transportation		50	Farkhad Gafiatullin and Gulmira Mukhanova (online presentation)	INTEGRATION OF MACHINE LEARNING AND COGNITIVE TECHNOLOGIES IN LOGISTICS: A COMPREHENSIVE ANALYSIS
14	Souvanthone Phetoudom and Emese Mako	Effect of legal and illegal pedestrian crossing manoeuvres on road capacity		68	Aybuke Nacak and Melih Yıldız	Digital Twin in Aircraft Design		16	Zhazira Tymbaeva and Daulet Bakytzhan (online)	Ensuring passenger mobility in the urban environment (on the example of Almaty)
23	Laura Dietl and Christian Facchi	Is Maximum Entropy Deep Inverse Reinforcement Learning suitable for Pedestrian Path Prediction?		15	Marko Perić, Aleksandar Miltenović, Milan Banić and Szabolcs Fischer	Visual Inspection in Transport Using Autonomous Robots		27	Gulmira Mukhanova and Nazerke Tolkynbek (online)	Quantitative and qualitative indicators of a reverse supply chain strategy
								48	Saule Bekzhanova and Kuralay Yussupova (online)	Cognitive technologies of transporting waste from mining industry

12:50-13:30 — Lunch Break

13:30-14:15	**Roundtable discoussion at Auditorium**
	Student competitions as the witch's kitchen of future mobility
	Hosted by HUMDA-Lab, Hungarian Mobility Agency, member of Foundation for Szechenyi University
	Gábor Sipos (HUMDA-Lab), Zalán Demeter (HUMDA-Lab), Péter Balog (Robert Bosch Kft), Alex Dudás (FS East), Péter Pácsonyi (BME Motorsport), moderator: Dr. Márk Csörnyei (Robert Bosch Kft)
14:15-14:35	K8 Logistics small container - cognitive sustainability in logistics (Energotest Ltd)
14:35-14:55	Bosch technology presentation - Wiper systems (Robert Bosch Ltd)
14:55-15:15	Mobility as an experience: transport and design (MOME Mobility Lab)

15:15-15:30 — Coffee Break

15:30-17:00 Auditorium	Parallel Session IV.			15:30-17:00 VIP 1	Parallel Session V.	
Session: 6 Advanced drives				**Session: Smart vehicles**		
Session Chair: Dr. Peter Harth				**Session Chair: Dr. Laszlo Lovas**		
2	Mihály Katona and Tamás Orosz	Parameter Sensitivity Analysis and Rotor Topology Optimisation of a Synchronous Reluctance Machine		31	Áron Fésüs, Bálint Kővári, Tamás Bécsi and László Leginusz	Dynamic Prompt-Based Approach for Open Vocabulary Multi-Object Tracking

47	Emil Nagy, Árpád Török and József Pázmány	Design factors for the electric power distribution system of EVs		4	Vivien Jóvér, Szabolcs Kocsis Szürke, Bence Hermán, Péter Böröcz, Miklós Kuczmann and Szabolcs Fischer	Vehicle Dynamics Measurements with a Unique Measuring System for Trams
64	Aleksandr Šabanovič, Jonas Matijosius, Arturas Kilikevicius and Aleksandras Chlebnikovas	Assessment of Particle Dynamics in Electric Air Filters: The Role of Ionic Wind in Air Quality Improvement		8	Symbat Zhanguzhinova and Emese Mako	Assessment of pedestrian confidence in LED interface communication tools in VR and real traffic situations
87	Ádám Nyerges and Dávid Tollner	Battery Electric Vehicle Powertrain Behavior on a High-Speed Handling Course		63	István Lerchner	Application of Cognitive Mobility approach in highlighted areas
89	István Szászi, Vilmos Paiss, Richárd Csaba Kovács, Csongor Horváth and Tibor Vajsz	A New Type of Motor Topology for Reducing the Torque Ripples in Synchronous Reluctance Motor Drives of Electric Vehicles		69	Ebru Bahcecioglu and Melih Yıldız	WING-in-GROUND (WIG) AIRCRAFT for EUROPEAN AIRSPACE
90	Kristof Bukovacz, Gábor Sipos, László Sebestyén and Gergely Bári	Comparative Analysis of Hydrogen Storage Methods for Racecars		80	Alpaslan Durmuş, Ahmet Murat Kadioğlu, Abdulhamit Sevgi and Erol Duymaz	Using of Novel Ground Effect UAV Systems in Defence
86	Mahmoud Said Jneid, Péter Harth and Árpád Török	Vector Control of Special 24-Phase Protean In-Wheel-Motor Used In EV Applications				
19:00-		**Banquet at Vakvarjú Pest (Budapest V. Paulay Ede 7 street)**				

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8:00-9:30 Room: Auditorium		**Parallel Session VII.**		8:00-9:30 Room VIP 1		**Parallel Session VI.**
Session: Environmental perception 1				**Session: Enchanted safety**		
Session Chair: Prof. Dr. Tamás Bécsi				**Session Chair: Dr. Árpád Török**		
30	György Csippán, Bálint Kővári, Tamás Bécsi and László Leginusz	Real-Time Media Synthesis from Speech: A New Era in Passenger Entertainment		1	Szabolcs Fischer, Mykola Kurhan and Dmytro Kurhan	Innovative Technologies and Cognitive Factors for Enhancing Safety of Train and Car Movement at Level Crossings
55	Áron Dávid Agg, Bence Gábor Péter and András Horváth	Adaptive vehicle trajectory clustering based on Computer Vision		18	Noura Hamdan and Tibor Sipos	Traffic Accidents Severity Prediction using Support Vector Machine Models
70	Ayşe Nur Dişlitaş, Melih Yıldız and Gyorgyi Kale-Halasz	Digital Twin Applications in Aircraft Design Process		22	Viktoria Otvos and Gábor Pauer	Road safety education in public education - What support do teachers need?
88	Alpaslan Durmuş, Ahmet Murat Kadioğlu and Abdulhamit Sevgi	Precission Agriculture and Using of UAV Systems		52	József Répás	The main steps of the digital forensics examination methodology of modern transport vehicles
56	Balázs Benedek and Adrian Coleşa	CANComa: Shutdown Attack on Automotive Control Units over Controller Area Network		28	Csaba Tóth and Szabolcs Fischer	The road pavement structure as a forgotten element of the transport infrastructure system
9:30-9:50		**Coffee Break & Poster section**				
9:30-9:45		**Poster section**				
Session Chair: Prof. Dr. Szabolcs Fischer						
19	Eszter Tóth, András Pollák and Szabolcs Fischer				Exploring the Impact of Fiber Content on the Mechanical Performance of Steel Fiber Reinforced Concrete: Consistency and Compaction Time Analysis	

20	Hanna Csótár, Brigitta Fruzsina Szívós, Szabolcs Szalai and Szabolcs Fischer	Production and Testing of 3D Printed PLA Structures with DIC Technology for the Reinforcement of Concrete Elements				
6	Zoltán Major, Vivien Jóvér, Attila Németh and Szabolcs Fischer	Quantifying the effect of frame stiffness – the substitution inertia of Meier's calculation				

9:50-10:50	**Bosch Innovation Campus site visit (Starts from the Aula)**
10:50-11:10	Vehicles and their environment in interaction - Interaction Design MA projects at MOME (MOME)
11:10-11:30	Micromobility - the driving force comes from Bosch (Robert Bosch Ltd)
11:30-11:50	Sensing and communication under attack (BME)
11:50-13:00 **Room Auditorium**	**Parallel Session VIII.**

Session: 4 Learning techniques in cognitive mobility

Session Chair: Dr. Szilárd Aradi

67	Cihan Gökçe, Melih Yıldız and Györgyi Kale Halasz	VTOL Craft Controller Design and Simulation Using Digital Twin				
36	Mehran Amini, Ahmet Mehmet Karadeniz and László T. Kóczy	Evaluating Deep Learning Algorithms for Freeway Mainstream Traffic Control				
53	Roland Nagy, Zsombor Pethő and Árpád Török	Effective anomaly intrusion detection system based on ML methods in vehicular networks				
71	Farzad Zolfaghari, Györgyi Kale-Halasz, Omar Alharasees and Arturas Kilikevicius	Application of Deep Learning Models for Predicting Health Alerts in Pilots				

13:00-13:45	**Closing Lunch**