

Program overview

Saturday, 10 September 2022	16:30-16:50	Hall 1	Conference Opening Ceremony
	16:50-17:50	Hall 1	Plenary Session
	20:00-23:00	Welcome Cocktail Party – “Lazur” Holiday House	

Sunday, 11 September 2022		Hall 1	
	9:00-11:00	Session: Aeronautics	
	11:00-11:30	Coffee Break	
	11:30-13:00	Session: Aeronautics / Water Transport	
	13:00-14:00	Lunch Break	
	14:00-16:30	Session: Dynamics, Strength and Reliability in Transport	
	16:30-17:00	Coffee Break	
	17:00-19:00	Session: Transport Infra-Structure / Transport Management and Logistics	
	20:00-23:00	Official Banquet – Hotel “Selena” Sozopol	

Monday, 12 September 2022		Hall 1	
	9:00-11:30	Session: Automotive Engineering and Technologies / Information Technologies in Transport	
	11:30-13:00	Lunch Break	
	13:00-15:00	Session: Automotive Engineering and Technologies	
	15:00-15:30	Coffee Break	
	15:30-18:00	Session: Railway Engineering and Technologies	

Technical Program

Saturday, 10 September 2022

Hall 1

16:30 **Conference Opening Ceremony**

Plenary Session

16:50 **Detection and Analysis of Commercial Drivers' Focus and Attention Using Sensors and Simulators**

S. Stavrev, D. Ginchev, *Technical University of Sofia, Bulgaria*

17:20 **Model-Based Study of the Influence of Selected Parameters on the Performance of a Low-Powered SOFC**

Ts. Gechev¹, P. Punov¹, Z. Dimitrova², ¹*Technical University of Sofia, Bulgaria*, ²*STELLANTIS, France*

Section: Aeronautics**Sunday, 11 September 2022, Hall 1**

Chairman: Assoc. Prof. H. Panayotov, PhD, *Technical University of Sofia, Branch Plovdiv, Bulgaria*

- 09:00 **CFD Investigation of a Flapped Airfoil with an Integrated Electric Fan**
V. Strazzullo, G. Likov, V. Serbezov, *Technical University of Sofia, Bulgaria*
- 09:20 **Automatic Landing System Using Brain Emotional Learning Based Intelligent Controller:
A New Algorithm** (Online)
J. Roshanian¹, M. Bajelani¹, H. Panayotov², K. Georgiev³, ¹ *K. N. Toosi University of Technology, Tehran, Iran,*
² *Technical University of Sofia, Plovdiv Branch, Bulgaria,* ³ *Technical University of Sofia, Bulgaria*
- 09:40 **Experimental Study of UAV Rotor Performance During Vertical Landing in Ground Effect**
F. Panayotov, V. Serbezov, R. Nikolova, M. Todorov, *Technical University of Sofia, Bulgaria*
- 10:00 **Reinforcement Learning Applied to Multidisciplinary Systems Design Optimization of an Aerial Vehicle**
Ali A. Bataleblu¹, Z. Bakhtiari¹, J. Roshanian¹, D. Ginchev², ¹ *K. N. Toosi University of Technology, Tehran,*
² *Technical University of Sofia, Bulgaria*
- 10:20 **Application of Virtual Reality Aviation Simulator in Rehabilitation of Children with Cerebral Palsy**
D. Ginchev, R. Ilieva, Z. Lu, Q. Wang, N. Gaydarov, *Technical University of Sofia, Bulgaria*
- 10:40 **Impact of 5G on Flight Safety**
M. Ivanov, K. Georgiev, *Technical University of Sofia, Bulgaria*

Coffee Break

Section: Aeronautics / Water Transport
Sunday, 11 September 2022, Hall 1

Chairman: Prof. M. Todorov. PhD, *Technical University of Sofia, Bulgaria*

- 11:30 **Numerical Modelling of the Aerodynamic and Acoustic Properties of a Small Air Vehicle Propeller**
M. Kulak, M. Lipian, *Institute of Turbomachinery, Lodz University of Technology, Lodz, Poland*
- 11:45 **Influence of Induced Boundary Layer Transition on Airfoil Performance – Numerical Study for Small Wind Turbine Application**
M. Stępień, M. Kulak, K. Jóźwik, *Institute of Turbomachinery, Lodz University of Technology, Lodz, Poland*
- 12:00 **Alternative and Biobased Materials for Small Wind Turbines**
M. Tomczak, F. Gocalińska, A. Baszczyńska, A. Fliszewska, A. Budzyń, M. Walczak, F. Grapow, *Institute of Turbomachinery, Lodz University of Technology, Lodz, Poland*
- 12:15 **Stress Diagnostic and Monitoring of Blade in Rotational Motion**
A. Jeżyński, T. Smaż, M. Brzozowska, Z. Nowak, M. Rogowska, P. Rogowski, M. Lipian, *Institute of Turbomachinery, Lodz University of Technology, Lodz, Poland*
- 12:30 **Application of Small Wind Turbines on Sailing Yachts**
B. Lewandowska, K. Zawadzki, M. Pisarski, F. Gocalińska, M. Sikorski, W. Gocalińska, M. Kulak, *Institute of Turbomachinery, Lodz University of Technology, Lodz, Poland*
- 12:45 **Expert Evaluation of Aviation Components**
D. Ginchev, *Technical University of Sofia, Bulgaria*

Lunch Break

Section: Dynamics, Strength and Reliability in Transport
Sunday, 11 September 2022, Hall 1

Chairman: Assoc. Prof. N. Nikolov, PhD, *Technical University of Sofia, Bulgaria*

- 14:00 **Multiobjective H₂-Control Design for Semi-Active Vehicle Suspension with Magneto-Rheological Damper. Part 1: Linear Quadratic Regulator Synthesis**
J. Genov, I. Kralov, I. Angelov, *Technical University of Sofia, Bulgaria*
- 14:20 **Multiobjective H₂-Control Design for Semi-Active Vehicle Suspension with Magneto-Rheological Damper. Part 2: Linear Quadratic Gaussian Regulator Synthesis**
J. Genov, I. Kralov, I. Angelov, *Technical University of Sofia, Bulgaria*
- 14:40 **Motion Analysis of a Spherical Pendulum with a Movable Pivot**
V. Jivkov, R. Mitrev, *Technical University of Sofia, Bulgaria*
- 15:00 **Transient Vibrations of an Elastically Suspended Rotor with Unlimited Excitation (“Ideal” Energy Source)**
V. Jivkov, *Technical University of Sofia, Bulgaria*
- 15:20 **Shear Modulus Determination of S235JRC Cold Drawn Steel by Tension and Torsion Tests**
N. Nikolov, V. Tsonev, *Technical University of Sofia, Bulgaria*
- 15:40 **Investigation of the Microstructure of the Aluminum-Silicon Alloy Surface Turned**
A. Lengerov, S. Sabev, P. Kasabov, D. Dimova, *Technical University of Sofia, Branch Plovdiv, Bulgaria*
- 16:00 **Investigation of the Influence of the Microstructure of AlSi25Cu4Cr and AlSi25Cu5Cr Alloys on the Roughness Class in Machining**
B. Dochev, S. Sabev, P. Kasabov, D. Dimova, *Technical University of Sofia, Branch Plovdiv, Bulgaria*

Coffee Break

Section: **Transport Infra-Structure / Transport Management and Logistics**
Sunday, 11 September 2022, Hall 1

Chairman: Assoc. Prof. D. Grozev, PhD, *University of Ruse, Bulgaria*

- 17:00 **Study of the Spatio-Temporal Characteristics of the Traffic on the International Road Artery Passing Through the Settlement**
V. Pencheva, A. Asenov, D. Grozev, I. Beloev, P. Stoyanov, K. Mineva, *University of Ruse, Bulgaria*
- 17:20 **Optimizing the Distribution of Work in the Automotive Workshop According to the Criteria of Minimum Delay Time**
D. Grozev¹, I. Georgiev^{1,2}, I. Beloev¹, M. Milchev¹,
¹ *University of Ruse, Bulgaria*, ² *Bulgarian Academy of Sciences, Sofia, Bulgaria*
- 17:40 **Transportation Detouring and Facility Location Optimization after the Flood in the Black Sea Region (Online)**
E. Demir, B. Bulut, *Antalya Bilim University, Antalya, Turkiye*
- 18:00 **Experimental Determination of the Acoustic Characteristics of an Interior Door**
R. Rusanov, V. Trifonov, K. Nedelchev, *Technical University of Sofia, Bulgaria*
- 18:20 **Study of the Existing Technologies for Vertical Handling of Intermodal Transport Units in Intermodal Terminals in Europe**
S. Martinov, *Technical University of Sofia, Bulgaria*

Section: Automotive Engineering and Technologies / Information Technologies in Transport**Monday, 12 September 2022, Hall 1****Chairman:** Assoc. Prof. A. Mitov, PhD, *Technical University of Sofia, Bulgaria***09:00 Identification of Variable Displacement Axial-Piston Pump with Proportional Valve Control**A. Mitov, J. Kralev, T. Slavov, *Technical University of Sofia, Bulgaria***09:20 Study of the Range of Stepless Change of the Gear Ratio of Dual Mode Hybrid Drives**B. Gigov, E. Dimitrov, *Technical University of Sofia, Bulgaria***09:40 Virtual Prototyping of Creep in Automotive Sensor Sealing (Online)**K. Kamberov, G. Todorov, T. Ivanov, *Technical University of Sofia, Bulgaria***10:00 Automotive Product Validation Through Virtual Prototyping at Early Design Stage (Online)**K. Kamberov, G. Todorov, T. Ivanov, *Technical University of Sofia, Bulgaria***10:20 Method for Determining the Technical Condition of Telescopic Shock Absorbers (Online)**Z. Georgiev, *University "Prof. D-r Asen Zlatarov" - Burgas, Bulgaria***10:40 Studies of Asynchronous Electrical Drives Required for Adaptive Control**V. Dimitrov, *Todor Kableshkov University of Transport, Sofia, Bulgaria***11:00 Performance Evaluation of Amplitude-Shift Keying Digital Modulation for Data Transmission Over an Audio Channel (Online)**I. Iliev, *Nikola Vaptsarov Naval Academy, Varna, Bulgaria***Lunch Break**

Section: Automotive Engineering and Technologies**Monday, 12 September 2022, Hall 1****Chairman:** Chairman: Assoc. Prof. P. Punov, PhD, *Technical University of Sofia, Bulgaria***13:00 Control of an Anti-lock Braking System Using Fuzzy Logic (Online)**D. Ivanova, R. Ivanov, *University of Ruse, Bulgaria***13:20 Study of Compressed Natural Gas Influence on the Spark Ignition Engine Performance (Online)**E. Dimitrov, *Technical University of Sofia, Bulgaria***13:40 Measurement of Velocity and Linear Acceleration During Vehicle Movement (Online)**D. Mladenov¹, V. Tsanov², ¹ *Technical University of Sofia, Faculty of Engineering and Pedagogy of Sliven, Bulgaria*, ² *Technical University of Sofia, Bulgaria***14:00 Analysis of Test Cycles for Driving Cars in Extra-Urban, Urban and Rural Traffic Conditions**Y. Dermendzhiyski, *Technical University of Sofia, Bulgaria***14:20 Predictive System for Tire-Road Adhesion Coefficient: High-Level Architecture and Main Requirements**A. Mazgarev, *Technical University of Sofia, Bulgaria***14:40 Security Risks and Methods for Protection in Autonomous Vehicles**M. Sharabov, A. Rusev, G. Tsochev, T. Ukov, *Technical University of Sofia, Bulgaria***Coffee Break**

Section: **Railway Engineering and Technologies**

Monday, 12 September 2022, Hall 1

Chairman: Prof. R. Mitrev, PhD, *Technical University of Sofia, Bulgaria*

- 15:30 **Analysis of the Influence of Freight Trains Length on Their Braking Distance**
S. Krastev, K. Velkov, O. Krastev, *Technical University of Sofia, Bulgaria*
- 15:50 **Study on Failure Probability of Passenger Bogie Frames (Online)**
V. Ralev, D. Atmadzhova, *Todor Kableshkov University of Transport, Sofia, Bulgaria*
- 16:10 **The Analysis of the Stress State of a Hopper-Type Container Under Operational Loads (Online)**
G. Vatulia¹, O. Fomin², A. Lovska¹, D. Skurikhin¹, V. Nerubatskyi¹, I. Levchenko³, Y. Krasnokutskyi⁴,
¹ *Ukrainian State University of Railway Transport, Kharkiv*, ² *State University of Infrastructure and Technologies, Kyiv, Ukraine*, ³ *Kharkiv National Automobile and Highway University, Ukraine*, ⁴ *Joint Stock Company “Ukrainian Railway” (abbreviated name – JSC “Ukrzaliznytsia”), Kyiv, Ukraine*
- 16:30 **Special Features of Determination of the Loads on the Passenger Car Frame with the Closed Center Sill (Online)**
S. Panchenko¹, G. Vatulia¹, O. Fomin², A. Lovska¹, D. Skurikhin¹, V. Nerubatskyi¹, V. Skurikhin³,
¹ *Ukrainian State University of Railway Transport, Kharkiv*, ² *State University of Infrastructure and Technologies, Kyiv, Ukraine*, ³ *O. M. Beketov National University of Urban Economy in Kharkiv, Ukraine*
- 16:50 **Regarding the Replacement of Steel Reinforcement in Pre-Stressed Concrete Sleepers with Composite Rebars (Online)**
A. Plugin¹, O. Kaliuzhna^{1,2}, O. Lobiak¹, D. Plugin¹, N. El'shad Faih ohly¹, M. Lagler², ¹ *Ukrainian State University of Railway Transport, Kharkiv*, ² *Vienna University of Technology, Vienna, Austria*
- 17:10 **Protection Against Electrical Corrosion of Railway Constructions by Grounded Screens from Silicate Compositions (Online)**
A. Plugin¹, O. Borziak¹, O. Kaliuzhna^{1,2}, O. Krykun¹, V. Zhuravel¹, ¹ *Ukrainian State University of Railway Transport, Kharkiv*, ² *Vienna University of Technology, Austria*
- 17:30 **Review of Station Passenger Barrier Systems for Automated Railway Transport**
E. Dimitrova, S. Tomov, *Todor Kableshkov University of Transport, Sofia, Bulgaria*