

## Program overview

<b>Friday, 10 September 2021</b>	16:30-16:50	Hall 1	<b>Conference Opening Ceremony</b>
	16:50-17:50	Hall 1	<b>Plenary Session</b>
	19:30-22:00	<b>Welcome Cocktail Party</b>	

<b>Saturday, 11 September 2021</b>		Hall 1	
	9:00-11:00	Session: <b>Aeronautics</b>	
	11:00-11:30	Coffee Break	
	11:30-13:30	Session: <b>Dynamics, Strength and Reliability of Vehicles</b>	
	13:00-14:00	Lunch Break	
	14:00-16:00	Session: <b>Transport Management and Logistics / Information Technologies in Transport</b>	
	16:00-16:30	Coffee Break	
	16:30-18:30	Session: <b>Railway Engineering and Technologies / Water Transport</b>	
	19:30-23:00	<b>Official Banquet</b>	

<b>Sunday, 12 September 2021</b>		Hall 1	
	9:00-11:00	Session: <b>Internal Combustion Engines and Alternative Fuels</b>	
	11:00-11:30	Coffee Break	
	11:30-13:30	Session: <b>Automotive Engineering and Technologies</b>	
	13:00-14:00	Lunch Break	
	14:00-15:40	Session: <b>Automotive Engineering and Technologies / Transport Infra-Structure</b>	

# Technical Program

Friday, 10 September 2021

Hall 1

16:30 **Conference Opening Ceremony**

## Plenary Session

16:50 **Fuel Cells as Auxiliary Power Units for Range Extender Electric Vehicles (Online)**  
Z. Dimitrova and W. Nader, *PSA Groupe, Centre Technique de Vélizy, France*

17:20 **Combined Cycles of SOFC/ICE and SOFC/GT – a Brief Review**  
Ts. Gechev and P. Punov, *Technical University of Sofia, Bulgaria*

**Section: Aeronautics**  
**Saturday, 11 September 2021**  
**Hall 1**

**Chairman:** Prof. Fawaz Massouh, PhD, *ENSAM-Paris, France*

09:00 **Predicting the Unscheduled Workload for an Aircraft Maintenance Work Package**

K. Georgiev and N. Vachev, *Technical University of Sofia, Bulgaria*

09:20 **Experimental Study of Multicopter Propeller Performance Near Ground at Different Inclination Angles**

G. Georgiev, V. Serbezov and M. Todorov, *Technical University of Sofia, Bulgaria*

09:40 **PIV Investigation of the Influence of the Power Setting of a UAV Helicopter Rotor in Hover on the Flow-Field Geometry**

F. Panayotov<sup>1</sup>, V. Serbezov<sup>1</sup>, I. Dobrev<sup>1</sup>, F. Massouh<sup>2</sup> and M. Todorov<sup>1</sup>, <sup>1</sup>*Technical University of Sofia, Bulgaria*, <sup>2</sup>*ENSAM-Paris, France*

10:00 **Evaluation of the Effectiveness of the Reason's Organizational Accident Model**

R. Hristova and K. Georgiev, *Technical University of Sofia, Bulgaria*

10:20 **Working Model of a Liquid-Gas Rocket Engine**

I. Kanter and D. Ginchev, *Technical University of Sofia, Bulgaria*

10:40 **Space Club - TU Sofia**

P. Kutsarova, D. Ginchev, V. Genov, *Technical University of Sofia, Bulgaria*

**Coffee Break**

**Section: Dynamics, Strength and Reliability of Vehicles**  
**Saturday, 11 September 2021**  
**Hall 1**

**Chairman:** Assoc. Prof. G. Stoychev, PhD, *Technical University of Sofia, Bulgaria*

11:30 **Predictive Fatigue Curve of Inconel 600 Wire at 700 °C**

N. Kuzmanov, V. Tsonev, N. Nikolov, *Technical University of Sofia, Bulgaria*

11:50 **Mathematical Modeling of the Longitudinal Motion of a Robotic Construction Manipulator With a Freely Suspended Payload** (Online)

V. Panov, M. Ivanova, R. Mitrev, *Technical University of Sofia, Bulgaria*

12:10 **Trajectory Planning of a Robotic Construction Manipulator Motion Based on a Fifth-Degree Polynomial with Preassigned Maximum Velocity and Acceleration** (Online)

R. Mitrev, V. Panov, M. Ivanova, *Technical University of Sofia, Bulgaria*

12:30 **Analysis of Delaminated Statically Undetermined Multilayered Beam under Relaxation** (Online)

V. Rizov, *University of Architecture, Civil Engineering and Geodesy, Bulgaria*

12:50 **Statically Undetermined Functionally Graded Beam under Torsion: a Longitudinal Fracture Analysis with Considering Creep** (Online)

V. Rizov, *University of Architecture, Civil Engineering and Geodesy, Bulgaria*

13:10 **High-Temperature Tests of Piston Hypereutectic Aluminum-Silicon Alloy AlSi18Cu3CrMn**

B. Dochev<sup>1</sup>, I. Panov<sup>1</sup>, V. Tsonev<sup>2</sup>, D. Dimova<sup>1</sup>, <sup>1</sup>*Technical University of Sofia, Branch Plovdiv* and <sup>2</sup>*Technical University of Sofia, Bulgaria*

**Lunch Break**

**Section: Transport Management and Logistics / Information Technologies in Transport**  
**Saturday, 11 September 2021**  
**Hall 1**

**Chairman:** Assoc. Prof. D. Grozev, PhD, *“Angel Kanchev” University of Ruse, Bulgaria*

**14:00 Optimizing the Distribution of Labor in Car Service**

I. Georgiev, D. Grozev, M. Milchev, I. Beloev, *“Angel Kanchev” University of Ruse, Bulgaria*

**14:20 Analysis of the Refusals when Operating a Car Service with a Non-Stationary Inflow of Requests**

D. Grozev, M. Milchev, I. Georgiev, I. Beloev, *“Angel Kanchev” University of Ruse, Bulgaria*

**14:40 Risk Assessment of Transport Processes by Agent-Based Simulation (Online)**

V. Matsiuk<sup>1</sup>, N. Ilchenko<sup>2</sup>, O. Pryimuk<sup>2</sup>, D. Kochubei<sup>2</sup>, A. Prokhorchenko<sup>3</sup>, <sup>1</sup>*National University of Life and Environmental Sciences of Ukraine*, <sup>2</sup>*Kyiv National University of Trade and Economics, Ukraine*, <sup>3</sup>*Ukrainian State University of Railway Transport, Ukraine*

**15:00 Forecasting a Long Sequence of Values with a Neural Network Using Direct and Recurrent Approaches (Online)**

K. Koparanov, R. Trifonov, D. Minkovska, K. Georgiev, *Technical University of Sofia, Bulgaria*

**15:20 Assessment of the Main Characteristics of the Operation of Car Parks in the Areas of City Centers**

A. Asenov, V. Pencheva, K. Mineva, *“Angel Kanchev” University of Ruse, Bulgaria*

**15:40 Perspective of Artificial Intelligence in Transport**

M. Sharabov and A. Georgiev, *Technical University of Sofia, Bulgaria*

**Section: Railway Engineering and Technologies / Water Transport**  
**Saturday, 11 September 2021**  
**Hall 1**

**Chairman:** Assoc. Prof. S. Slavchev, PhD, *Technical University of Sofia, Bulgaria*

- 16:30 **Concept of the Bearing Structure of an Open Car with Convex Walls** (Online)  
O. Fomin<sup>1</sup>, M. Gorbunov<sup>2</sup>, G. Vatulia<sup>3</sup>, A. Lovska<sup>3</sup>, P. Nosko<sup>4</sup>, <sup>1</sup>*State University of Infrastructure and Technologies, Ukraine,*  
<sup>2</sup>*Volodymyr Dahl East Ukrainian National University,* <sup>3</sup>*Ukrainian State University of Railway Transport,* <sup>4</sup>*National Aviation University, Ukraine*
- 16:50 **Experimental Research into the Strength of a Flat Car with Consideration of Elastic Interaction Between Fixed Fittings of a Flat Car and Container Fittings** (Online)  
G. Vatulia<sup>1</sup>, O. Fomin<sup>2</sup>, A. Lovska<sup>1</sup>, A. Okorokov<sup>3</sup>, M. Pavliuchenkov<sup>1</sup>, D. Petrenko<sup>1</sup>, <sup>1</sup>*Ukrainian State University of Railway Transport,*  
<sup>2</sup>*State University of Infrastructure and Technologies, Ukraine,* <sup>3</sup>*Dnipro National University of Railway Transport named after academician V. Lazaryan, Ukraine*
- 17:10 **Determination of the Relationship of Structural and Diagnostic Parameters of Locomotives Diesel Engines** (Online)  
V. Puzyr, O. Krashenin, Y. Datsun, O. Obozny, O. Lagereva, O. Shapatina, *Ukrainian State University of Railway Transport, Ukraine*
- 17:30 **Internal Concrete Corrosion Effects on the Reinforced-Concrete Sleepers** (Online)  
A. Plugin, O. Borziak, S. Miroshnichenko, O. Krykun, V. Zinchenko, *Ukrainian State University of Railway Transport, Ukraine*
- 17:50 **Simulation Model for Defining Brake Distance of Rail Vehicle**  
S. Krastev, K. Velkov, O. Krastev, *Technical University of Sofia, Bulgaria*
- 18:10 **Shore-Based Pilotage of a Vessel in Real - Time by use of Navigational Simulator and Contemporary Methods of Communication** (Online)  
I. Ivanov, *Technical University of Varna, Bulgaria*

**Coffee Break**

**Section: Internal Combustion Engines and Alternative Fuels****Sunday, 12 September 2021****Hall 1****Chairman:** Assoc. Prof. P. Punov, PhD, *Technical University of Sofia, Bulgaria***09:00 Model of the Combustion Process in the Spark Ignition Engine Fueled with CNG**V. Horák<sup>1</sup>, H. H. Nguyen<sup>1</sup>, L. D. Duc<sup>2</sup>, Š. Čornák<sup>1</sup>, <sup>1</sup>*University of Defence, Czech Republic*, <sup>2</sup>*Le Quy Don Technical University, Vietnam***09:20 Influence of the Seal Types on the Piston Movement Resistance in Hydraulic Cylinder**J. Goszczak<sup>1</sup>, Z. Dimitrova<sup>2</sup>, G. Mitukiewicz<sup>1</sup>, R. Pietruszewski<sup>1</sup>, D. Batory<sup>1</sup>, <sup>1</sup>*Lodz University of Technology, Poland*, <sup>2</sup>*PSA Groupe, Centre Technique de Velizy Route de Gisy, France***09:40 Study of the Compressed Natural Gas Influence on the Combustion Characteristics of a Diesel Dual-Fuel Engine (Online)**E. Dimitrov, *Technical University of Sofia, Bulgaria***10:00 Study of the Compressed Natural Gas Influence on the Noise of a Diesel Dual-Fuel Engine (Online)**E. Dimitrov, *Technical University of Sofia, Bulgaria***10:20 Investigation of the Gasoline Direct Engine Performance and Emissions Working on Ethanol and Gasoline at a High Compression Ratio (Online)**S. Iliev, "*Angel Kanchev*" *University of Ruse, Bulgaria***10:40 Assessment of the Cumulative Combustion Pressure in the IC Engine (Online)**L. Sitnik<sup>1</sup>, R. Wróbel<sup>1</sup>, M. Andrych-Zalewska<sup>1</sup>, Z. Ivanov<sup>2</sup>, R. Dimitrov<sup>2</sup>, V. Mihaylov<sup>2</sup>, <sup>1</sup>*Wroclaw University of Science and Technology, Poland*, <sup>2</sup>*Technical University of Varna, Bulgaria***11:00 Analysis of the Influence of Chemical Compounds on the Improvement of Combustion (Online)**P. Kardasz, *Wroclaw University of Informatics, Poland and Foundation for Research on Development and Innovation, Poland***Coffee Break**

**Section: Automotive Engineering and Technologies****Sunday, 12 September 2021****Hall 1**

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

**11:30 Experimental Determination of the Tire-Road Friction Coefficient for a Vehicle with Anti-Lock Braking System**

H. Uzunov, S. Karapetkov, K. Dimitrov, S. Dechkova, *Technical University of Sofia, Faculty and College – Sliven, Bulgaria*

**11:50  $H_{\infty}$  Control of Load-Sensing Electro-Hydraulic Servo System**

A. Mitov, J. Kralev, T. Slavov, I. Angelov, *Technical University of Sofia, Bulgaria*

**12:10 Experimental Determination of the Influence of Load Transfer on the Basic Geometrical Parameters of the Motorcycle During Braking**

S. Hesapchieva, D. Hlebarski, G. Yanachkov, *Technical University of Sofia, Bulgaria*

**12:30 Research on Maneuverability Control System of Long-wheelbase Semi-trailers Truck (Online)**

V. Sakhno<sup>1</sup>, O. Timkov<sup>1</sup>, D. Yashchenko<sup>1</sup>, V. Bosenko<sup>1</sup>, D. Popelysh<sup>2</sup>, <sup>1</sup>*National Transport University, Ukraine*, <sup>2</sup>*State Road Transport Research Institute, Ukraine*

**12:50 Modelling of Space Vector Pulse - Width Modulation for Electric Vehicles Application (Online)**

V. Totev and V. Gueorgiev, *Technical University of Sofia, Sofia, Bulgaria*

**13:10 Defining Program for Gathering Information of the Traction Limits**

A. Mazgarev, *Technical University of Sofia, Sofia, Bulgaria*

**Lunch Break**

**Section: Automotive Engineering and Technologies / Transport Infra-Structure**

**Sunday, 12 September 2021**

**Hall 1**

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

**14:00 Investigation for Estimating of Concrete Strength by the Maturity Method and the Rebound Hammer Test (Online)**

L. Hrishev, I. Rostovsky, Iv.-A. Conev, V. Nikolov, *University of Architecture, Civil Engineering and Geodesy, Bulgaria*

**14:20 Logistics Model for Handling of Intermodal Transport Units in a Multifunctional Rail-Road Terminal (Online)**

S. Martinov, *Technical University of Sofia, Bulgaria*

**14:40 Investigation of the Acoustic Characteristics of a Double-Leaf Door at Different Wing Positions**

R. Rusanov, V. Trifonov, K. Nedelchev, *Technical University of Sofia, Bulgaria*

**15:00 A Short Review of Alternative Powertrains for Heavy-duty Vehicles**

Ts. Gechev and N. Pavlov, *Technical University of Sofia, Bulgaria*

**15:20 Analysis of Lateral Tilting Mechanisms in Vehicles**

N. Pavlov and D. Dacova, *Technical University of Sofia, Bulgaria*