

PROGRAM

Thursday, 10 September 2020

Hall 1

16:30 **Conference Opening Ceremony**

Plenary Session

- 16:50 **Fuel cell electric vehicles. Investigation of the energy balance for optimal reforming process of bio-ethanol**
Z Dimitrova, *PSA Groupe, Centre Technique de Vélizy, France*
- 17:20 **Driving strategy for minimal energy consumption of an ultra-energy-efficient vehicle in Shell Eco-marathon competition**
C Gechev and P Punov, *Technical University – Sofia, Bulgaria*

Section: Aeronautics

Friday, 11 September 2020

Hall 1

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

- 09:00 **Experimental study of the influence of the number of blades on the profile drag of UAV helicopter rotors in hover**
F Panayotov¹, I Dobrev², F Massouh², M Todorov¹, ¹*Technical University – Sofia, Bulgaria*, ²*Arts et Métiers ParisTech, France*
- 09:20 **Comparative study of the energy efficiency of diesel and hybrid powered light aircraft**
V Serbezov and M Nikolova, *Technical University – Sofia, Bulgaria*
- 09:40 **Sustainable design of the generative urban small wind turbine**
K Zawadzki, A Baszczyńska, M Stępień, A Fliszewska, S Molenda and M Pisarski, *Lodz University of Technology*
- 10:00 **Optimal sector modelling of airspace based on optimization algorithms**
T Todorov and S Simeonov, ¹*Technical University – Sofia, Bulgaria*
- 10:20 **Dynamics of air conflict resolution by heading maneuvering**
P Petrov and I Dimitrov, *Technical University – Sofia, Bulgaria*
- 10:40 **Propeller rotation speed measurement on a test stand by frequency analysis of torque-force sensor output**
V Serbezov, *Technical University – Sofia, Bulgaria*

Coffee Break

Section: Dynamics, Strength and Reliability of Vehicles

Friday, 11 September 2020

Hall 1

- Chairman:** Assoc. Prof. N. Nikolov, PhD, *Technical University – Sofia, Bulgaria*
- 11:30 **Functionally graded structural member with three longitudinal circular cylindrical cracks loaded in tension: a fracture analysis** (Online)
V Rizov, *University of Architecture, Civil Engineering and Geodesy, Sofia, Bulgaria*
- 11:50 **Theoretical analysis of fracture in non-linear elastic functionally graded beam of linearly changing height with three longitudinal cracks** (Online)
V Rizov, *University of Architecture, Civil Engineering and Geodesy, Sofia, Bulgaria*
- 12:10 **Load-bearing capacity evaluation of variously shaped steel-concrete slabs under short term loading** (Online)
G Vatulua, N Smolyanyuk, A Shevchenko, Y Orel and M Kovalov, *Ukrainian State University of Railway, Ukraine*
- 12:30 **Simulation of steel rod atmospheric corrosion by alternate immersion in salt solution**
V Tsonev, N Nikolov, K Penkov and Y Marcheva, *Technical University – Sofia, Bulgaria*
- 12:50 **Numerical investigation on the effects of the aerodynamic shading between the tower and the blade of wind turbine generator with horizontal axis**
J Genov and I Angelov, *Technical University – Sofia, Bulgaria*
- 13:10 **Mechanical properties of polymer material test pieces, derived by additive manufacturing**
K Nikolov and V Tsonev, *Technical University – Sofia, Bulgaria*

Lunch Break

Section: Railway Engineering and Technologies

Friday, 11 September 2020

Hall 1

- Chairman:** Assoc. Prof. S Slavchev, PhD, *Technical University – Sofia, Bulgaria*
- 14:00 **The crack resistance of reinforced-concrete sleepers with elastic rail fastening systems without base-plate** (Online)
A Plugin, S Miroshnichenko, O Lobiak, O Kalinin and D Plugin, *Ukrainian State University of Railway Transport, Ukraine*
- 14:20 **Increasing the safety operation of railway tanks in emergency situations by improving the design of boiler bottom protective elements** (Online)

P Šťastniak, J Gerlici and Kateryna Kravchenko, *University of Žilina, Slovak Republic*

- 14:40 **The loading on the carrying structure of a flat wagon under transportation of military equipment conducting fire** (Online)
O Fomin, G Vatulua and A Lovska, *Ukrainian State University of Railway Transport, Ukraine*
- 15:00 **The research into the dynamic loading on the carrying structure of a flat wagon of lower center of gravity under conducting fire** (Online)
O Fomin, A Lovska, M Pavliuchenkov and S Sova, *Ukrainian State University of Railway Transport, Ukraine*
- 15:20 **Comparative strength analysis of the railway bogie Y25Ls-K**
V Maznichki, *Technical University – Sofia, Bulgaria*

Coffee Break

Section: Transport Infra-Structure / Transport Management and Logistics

Friday, 11 September 2020

Hall 1

Chairman: Assoc. Prof. T. Zhelyazov, PhD, *Technical University – Sofia, Bulgaria*

- 16:30 **Comparative analysis of acoustic efficiency of classical and sonic crystals noise barriers** (Online)
E Gieva, I Ruskova, K Nedelchev and I Kralov, *Technical University – Sofia, Bulgaria*
- 16:50 **Numerical investigation of the mechanical behaviour of a structural element containing a self-healing agent**
T Zhelyazov and R Ivanov, *Technical University – Sofia, Bulgaria*
- 17:10 **Development of a method for studying the influence of the time reserve value on the reliability of the train schedule based on the epidemiological SIR model** (Online)
S Panchenko, A Prokhorchenko, O Dekarchuk, D Gurin, D Mkrtychian and V Matsiuk, *Ukrainian State University of Railway Transport, Ukraine*
- 17:30 **Investigation of the operation of taxi traffic in emergency conditions**
D Grozev, I Georgiev and D Georgiev, *“Angel Kanchev” University of Ruse, Bulgaria*
- 17:50 **Lifelong learning and digital technologies of the transport operators in a Bulgarian context** (Online)
Petya Fileva, *University of National and World Economy, Bulgaria*

PROGRAM

Section: Information Technologies in Transport / Green Transport

Saturday, 12 September 2020

Hall 1

Chairman: Prof. D. Gotseva, PhD, *Technical University – Sofia, Bulgaria*

09:00 **Electromagnetic analysis of a contactless charging station for electric vehicles** (Online)
N Hinov, N Madzharov and D Grozdanov, *Technical University – Sofia, Bulgaria*

09:20 **Comparative study of selected cryptocurrency**
O Nakov, D Gotseva and Y Tomov, *Technical University – Sofia, Bulgaria*

09:40 **Investigation of the impact of cyber attacks on communication and information systems using specialized software for simulations and modeling**
V Radkov¹, D Vassileva², D Valcheva² and V Aleksandrova²,
¹*Technical University – Sofia, Bulgaria*, ²*“G. S. Rakovski” National Defence College*

10:00 **Application of aerial photogrammetry for research and study of road junctions from the street network** (Online)
V Madjarski and Iliyan Damyanov, *Technical University – Sofia, Bulgaria*

10:20 **Parameters of quantitative assessment of the mentality of drivers** (Online)
V Madjarski, *Technical University – Sofia, Bulgaria*

Coffee Break

Section: Internal Combustion Engines

Saturday, 12 September 2020

Hall 1

Chairman: Assoc. Prof. P. Punov, PhD, *Technical University – Sofia, Bulgaria*

11:30 **Study of hydrogen gaseous fuel influence on the thermal condition of a diesel engine**
E Dimitrov, M Peychev, Ph Michaylov and S Pantchev, *Technical University – Sofia, Bulgaria*

11:50 **Operation of diesel engine with fuels treated with nanoparticle additives**

Z Ivanov¹, V Mihaylov¹, L Sitnik² and Z Sroka², ¹*Technical University of Varna, Bulgaria*, ²*Wroclaw University of Science and Technology, Poland*

12:10 **Experimental study of the flame propagation of gaseous fuel based mixture using optical visualization**
R Hristov, S Stefanov and R Dimitrov, *Technical University of Varna, Bulgaria*

12:30 **Creating and research a method of automotive engine control unit for achieving different operating modes using software modification**
N Nikolov and D Gotseva, *Technical University – Sofia, Bulgaria*

12:50 **Combustion process in a diesel engine operating in HCCI mode: Case study of exhaust gas recirculation effect**
S Mihalkov and P Punov, *Technical University – Sofia, Bulgaria*

13:10 **Analysis of the effect of gas fuels on the performance of compression ignition engines operating in dual-fuel mode** (Online)
A Tashev, *Technical University – Sofia, Bulgaria*

Lunch Break

Section: Automotive Engineering and Technologies

Saturday, 12 September 2020

Hall 1

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

14:00 **Energy demand assessment for long term operation of hybrid electric vehicles** (Online)
L Sitnik², Z Ivanov¹ and Z Sroka², ¹*Technical University of Varna, Bulgaria*, ²*Wroclaw University of Science and Technology, Poland*

14:20 **Random vibration endurance test of automotive component using virtual prototyping** (Online)
G Todorov and K Kamberov, *Technical University – Sofia, Bulgaria*

14:40 **Determination the yaw moment of inertia of an SUV in the laboratory condition** (Online)
D Yashchenko, O Timkov, I Samburenko and V Hladchenko, *National Transport University, Ukraine*

15:00 **Service for optimization of charging stations selection for electric vehicles users during long distances drives: time-cost tradeoff** (Online)
J Hassler, Z Dimitrova, M Petit and Ph Dessante, *PSA Groupe, Centre Technique de Vélizy, France*

15:20 **Experimental investigation of the motorcycle braking properties when riding on different road surfaces** (Online)
D Barta, J Dižo, M Blatnický and J Vaňko, *University of Žilina, Slovak Republic*

15:40 **Investigation of power split schemes for the modern hybrid cars transmissions**
B Gigov and E Dimitrov, *Technical University – Sofia, Bulgaria*

Coffe Break

Section: Automotive Engineering and Technologies

Saturday, 12 September 2020

Hall 1

Chairman: Assoc. Prof. P. Punov, PhD, *Technical University – Sofia, Bulgaria*

16:30 **Efficiency of automotive electric supercharging compressors**
P Podevin¹, C Périllon¹, M Deligant², P Punov³, Adrian Clenci⁴, G. de La Bourdonnaye⁵, ¹*Le Cnam, Conservatoire national des arts et métiers, Paris, France*, ²*Arts et Métiers ParisTech, Paris, France*, ³*Technical University – Sofia, Bulgaria*, ⁴*University of Pitesti, Romania*, ⁵*Valeo, Cergy-Pontoise, France*

16:50 **A study on characteristics of vacuum solenoid valves**
S Stoyanov and V Mihaylov, *Technical University of Varna, Bulgaria*

17:10 **Comparison between Model Predictive (MPC) and Model Reference Adaptive Controllers (MRAC) for Electrohydraulic Steering System Implemented as Real-Time Simulink® Program**
A Mitov, J Kravec, T Slavov and I Angelov, *Technical University – Sofia, Bulgaria*

17:30 **Numerical study of the vibrational behaviour of a motorcycle at different castor angle**
S Hesapchieva, *Technical University – Sofia, Bulgaria*

17:50 **Experimental study of motorcycle trim while braking**
S Hesapchieva, D Hlebarski, G Yanachkov, E Dimitrov and Z Georgiev, *Technical University – Sofia, Bulgaria*

18:10 **Study on regenerative braking modes of a small electric car**
N Pavlov¹, V Dimitrov² and B Gigov¹, ¹*Technical University – Sofia, Bulgaria*, ²*Todor Kableshkov University of Transport*