



14<sup>th</sup> International Science & Technical Conference

# AUTOMOTIVE SAFETY

24-26 APRIL 2024 | SANDOMIERZ (PL) | 2024 EDITION

## CONFERENCE PROGRAM

### ORGANIZERS

- ⇒ The Department of Automotive Engineering and Transport at the Faculty of Mechatronics and Mechanical Engineering of the Kielce University of Technology,
- ⇒ The Faculty of Transport of the Warsaw University of Technology,
- ⇒ The Department of Road and Urban Transport at the Faculty of Operation and Economics of Transport and Communications of the University of Žilina
- ⇒ The Łukasiewicz Automotive Industry Institute

### PARTNERS

- Ministry of Science and Higher Education Republic of Poland
- The project is supported by Polish Ministry of Science and Higher Education through the Excellent Science II programme
- KIELECKIE TOWARZYSTWO NAUKOWE

### MEDIA

[automotivesafetyconference.com](http://automotivesafetyconference.com)

Version 15/4/24

## TUESDAY

23 APRIL 2024

- 16<sup>00</sup> – 18<sup>00</sup> REGISTRATION OF PARTICIPANTS
- 18<sup>00</sup> BARBECUE DINNER

## WEDNESDAY

24 APRIL 2024

7<sup>00</sup> – 9<sup>00</sup> BREAKFAST

9<sup>00</sup> – 9<sup>30</sup> OPENING CEREMONIES

9<sup>30</sup> – 11<sup>00</sup>

### SESSION 1

- 9<sup>30</sup> – 10<sup>00</sup> **Bauder M., Langer R., Kubjatko T., Schweiger H.-G.**  
Post-Processing Kalman Filter Application for Improving the Cooperative Awareness Messages' Position Data Accuracy
- 10<sup>00</sup> – 10<sup>30</sup> **Langer R., Bauder M., Moghariya Ghanshyam T., Eckert M.C. G., Kubjatko T., Schweiger H.-G.**  
Testing and Validation of the Vehicle Front Camera Verification Method using External Stimulation
- 10<sup>30</sup> – 10<sup>45</sup> **Wach W., Kwieciński K.**  
On the linearity of the relationship between Equivalent Barrier Speed and residual crush in automobile collisions
- 10<sup>45</sup> – 11<sup>00</sup> **Putanowicz R., Wdowicz D., Bułka D.**  
Analysis of influence of occupant-vehicle interaction on dynamic simulation of road accidents using V-SIM program.

11<sup>00</sup> – 11<sup>10</sup> SPONSOR PRESENTATION - AVIONAUT

11<sup>10</sup> – 11<sup>30</sup> COFFEE BREAK

11<sup>30</sup> – 13<sup>00</sup>

### SESSION 2

- 11<sup>30</sup> – 12<sup>00</sup> **Fleck R., Schröder J., Brösdorf K.-D.; Kubjatko T.**  
Technical-experimental investigations to elucidation of insurance fraud
- 12<sup>00</sup> – 12<sup>30</sup> **Schröder J., Fleck R., Brösdorf K.-D., Kubjatko T.**  
Investigation and analysing of technical manipulations using forensic methods on vehicles
- 12<sup>30</sup> – 12<sup>45</sup> **Guzek M., Lozia Z.**  
The assistant system which supports the driver in potential collision situations when following another car
- 12<sup>45</sup> – 13<sup>00</sup> **Górniak W., Górniak A., Kowal M.**  
Biomechanical Analysis of Head and Neck Injuries in Frontal Oblique and Side Impact Collisions

13<sup>10</sup> – 13<sup>20</sup> SPONSOR PRESENTATION - MESCO

13<sup>30</sup> – 14<sup>50</sup> LUNCH

15<sup>00</sup> – 17<sup>30</sup>

### SESSION 3 "PRESENTATION OF YOUNGER RESEARCHERS"

- 15<sup>00</sup> – 15<sup>15</sup> **Bańkowski A., Jaśkiewicz M.**  
Overview of methods for head injuries during motorcyclist accidents
- 15<sup>15</sup> – 15<sup>30</sup> **Haberka K., Gruszczyński M., Jurecki R.**  
Analysis of drivers' reactions at pedestrian crossings – vehicle simulator studies
- 15<sup>30</sup> – 15<sup>45</sup> **Poliak M., Salamakhina E.**  
Research of the factors influencing the choice of modes of transport by consignor of goods in Slovak Republic and determining the importance of the safety factor in this process
- 15<sup>45</sup> – 16<sup>00</sup> **Gogoła M., Senko Š., Mikušová M.**  
Finding the correlation between transport infrastructure and the fatal accident rate of cyclists - an international perspective.
- 16<sup>00</sup> – 16<sup>15</sup> **Brzozowski M., Parczewski K.**  
Recognition of objects on the road by an autonomous vehicle in rainfall conditions
- 16<sup>15</sup> – 16<sup>30</sup> **Skuzza A., Szumska E., Jurecki R.**  
Fire safety of EVs – a review of homologation tests and empirical research

16 <sup>30</sup> –16 <sup>45</sup>	<b>Szczur R., Borucka A.</b> Micromobility - Issues and Challenges regarding Road Traffic Safety.
16 <sup>45</sup> –17 <sup>00</sup>	<b>Dobaj K.</b> Analysis of the possibility of selecting data ranges from operational braking processes for real-time diagnostics of the braking system
17 <sup>00</sup> –17 <sup>15</sup>	<b>Podosek K., Jaśkiewicz M., Zuska A.</b> The impact of vertical vibrations on a motorcyclist in various road conditions
17 <sup>15</sup> –17 <sup>30</sup>	<b>Gajda O., Gidlewski M., Jackowski J., Ziubiński M.</b> Transporting a child facing in the direction of travel backward - is it safe in terms of rear-end collisions?
17 <sup>30</sup> –17 <sup>45</sup>	<b>Grabski P., Frej D.</b> Analysis of vertical accelerations on the rotational base of a child seat

**17<sup>45</sup>– 18<sup>00</sup> COFFEE BREAK**

**18<sup>00</sup> – 19<sup>50</sup>**

**4 SESSION – SHORT\***

**1 SECTION**

ID paper	
18 <sup>00</sup> –18 <sup>08</sup>	1.1 <b>Kurczyński D.</b> The two-stroke engine is a chance for the automotive industry
18 <sup>08</sup> –18 <sup>16</sup>	1.2 <b>Kubiak P., Bogusławski G. Kopania J.M.</b> Experimental studies of gasoline engine noise with injector failure
18 <sup>16</sup> –18 <sup>24</sup>	1.3 <b>Okruh Ł, Dombrowski P., Jasiński P., Zarzycki K.</b> Energy absorbing structures for use in vehicles using an ultra-strong aluminum alloy AlMgSi(Cu)
18 <sup>24</sup> –18 <sup>30</sup>	1.4 <b>Turboś F., Madziara S., Koneczny P., Kubiak P., Mrowicki A., Stajuda Ł., Levchenko D., Siczek K., Pečman J., Šarkan B., Ližbetinová L. L'upták V.</b> Innovative Precrash Velocity Calculation for Forward-Facing Collisions Using Gaussian Process Regression and Modern Vehicle Data
18 <sup>30</sup> –18 <sup>38</sup>	1.5 <b>Abramowski M., Fundowicz P., Sar H., Reński A., Brukalski M.</b> Impact of Acceleration Style on Vehicle Emissions and Perspectives for Improvement through Transportation Engineering Solutions
18 <sup>38</sup> –18 <sup>46</sup>	1.6 <b>Górniak A., Górniak W.</b> Simulation analysis of semi-trailer steered wheels control algorithm
18 <sup>46</sup> –18 <sup>54</sup>	1.7 <b>Šarkan B, Loman M., Kováčová N., Strmenská L.</b> Biomechanical analysis of head and neck injury severity in lateral, frontal-oblique, and rear-oblique vehicle collisions
18 <sup>54</sup> –19 <sup>02</sup>	1.8 <b>Šarkan B., Kováčová N., Loman M.</b> Calculation of exhaust gas emissions produced by the operation of trucks in a specific transport company
19 <sup>02</sup> –19 <sup>10</sup>	1.9 <b>Šarkan B., Kováčová N., Loman M.</b> The influence of the technical state of the electronic control of the fuel mixture preparation of a spark ignition engine on the production of selected exhaust gas components
19 <sup>10</sup> –19 <sup>18</sup>	1.10 <b>Gryszczuk A., Gryszczuk P., Podkowski K., Sitnik L., Spirydowicz A.</b> Design and numerical analyses of the EVAN vehicle, EAGLE platform and EVACT system
19 <sup>18</sup> –19 <sup>26</sup>	1.11 <b>Frej D., Jaśkiewicz M., Gidlewski M.J., Górniak A., Poliak M., Hajduk I.E., Caban J., Stopka O., Tarnapowicz D.</b> Comparative Analysis of Head Movement of KPSIT Dummy during Collision at 20 km/h
19 <sup>26</sup> –19 <sup>34</sup>	1.12 <b>Zuska A., Kurczyński D.</b> Analysis of the possibility of using an acceleration sensor and a speed sensor to test the braking process parameters of N1 and N3 type cars
19 <sup>34</sup> –19 <sup>42</sup>	1.13 <b>Dobaj K., Szczypiński-Sala W.</b> The on-board diagnostic method of the ABS/ESP actuators using the self-organizing map
19 <sup>42</sup> –19 <sup>50</sup>	1.14 <b>Łagowski P.</b> A system for measuring fast-variable quantities in a compression-ignition engine with a CR power system

ID paper

**2 SECTION**

18 <sup>00</sup> –18 <sup>08</sup>	2.1 <b>Maj M., Gil L., Kasperek D., Dmowski A.</b> Comparison of time and inference efficiency of current and adjacent lines detection algorithms in the safety of autonomous vehicles
18 <sup>08</sup> –18 <sup>16</sup>	2.2 <b>Borucka A., Byleń S.</b> Safety of transport processes in tactical operations
18 <sup>16</sup> –18 <sup>24</sup>	2.3 <b>Turoboś F., Koneczny P., Mrowicki A., Madziara S., Stajuda Ł., Šarkan B., Kubiak P., Levchenko D., Meisner N.</b> Gaussian Process Regression as a precrash velocity determination method—subcompact vehicle class
18 <sup>24</sup> –18 <sup>30</sup>	2.4 <b>Zitrický V., Pálková A., Nedeliaková E.</b> Integration of passengers with reduced mobility into the railway system
18 <sup>30</sup> –18 <sup>38</sup>	2.5 <b>Benčo D., Kubasáková I.</b> Legislative analysis for autonomous vehicles
18 <sup>38</sup> –18 <sup>46</sup>	2.6 <b>Jaroń A., Borucka A.</b> Analysis of the results of traffic intensity measurements on the example of a selected road section in the Silesian Voivodeship
18 <sup>46</sup> –18 <sup>54</sup>	2.7 <b>Turek M., Kalupová B., Cempírek V., Tůmová K.</b> Electromobility and the environment
18 <sup>54</sup> –19 <sup>02</sup>	2.8 <b>Kurczyński D., Zuska A.</b>

19 <sup>02</sup> –19 <sup>10</sup>	2.9	The use of acceleration and speed sensors for experimental research of the influence of water flowing on asphalt on selected traction properties of a minibus car <b>Caban J., Seńko J., Nowak R., Wróbel T., Koziak S., Podkowski K.</b>
19 <sup>10</sup> –19 <sup>18</sup>	2.10	Analysis of the body structure design of an electric city bus <b>Dindorf R.</b>
19 <sup>18</sup> –19 <sup>26</sup>	2.11	Functional Safety of the Hydraulic Drive Control System of a Tracked Undercarriage. <b>Čulík K., Kalašová A.</b>
19 <sup>26</sup> –19 <sup>34</sup>	2.12	Comparison of the Capacity and Efficiency of a Turbo-Roundabout and a Single-Lane Roundabout <b>Szumaska E.M., Skuza A., Jurecki R.</b>
19 <sup>34</sup> –19 <sup>42</sup>	2.13	Comparative analysis of emissions from electric and conventional vehicles in Poland: Insights into energy generation and Euro standards <b>Szwajkowski P., Kijania K., Durau M., Klimowicz K.</b>
19 <sup>42</sup> –19 <sup>50</sup>	2.14	Analysis of emergency braking and avoidance maneuvers by an autonomous car in selected road conditions <b>Abramowski M., Fundowicz P., Sar H., Reński A., Brukalski M., Rokicki K.</b>
		Determining tyre adhesion characteristics based on the road tests of automobile

ID paper

**3 SECTION**

18 <sup>00</sup> –18 <sup>08</sup>	3.1	<b>Herc K., Borucka A., Kostur-Balcerzak K.</b> Modern Solutions and Automation in Ground Handling at Airports
18 <sup>08</sup> –18 <sup>16</sup>	3.2	<b>Gajda O., Gidlewski M., Jackowski J., Ziubiński M.</b> Carrying a child rear-facing - is it safe in the event of a collision with the rear of a passenger car?
18 <sup>16</sup> –18 <sup>24</sup>	3.3	<b>Hrudkay K., Čulík K., Kalašová A.</b> Sensor data based city center logistics for transport planning and public service systems
18 <sup>24</sup> –18 <sup>30</sup>	3.4	<b>Kądziołka T.</b> Transport and storage of selected industrial waste
18 <sup>30</sup> –18 <sup>38</sup>	3.5	<b>Konečný V., Jonasíková D., Zuzaniak M.</b> Performance research in road freight transport and logistics in the Slovak Republic and in selected countries
18 <sup>38</sup> –18 <sup>46</sup>	3.6	<b>Zuzaniak M., Konečný V., Jonasíková D.</b> Study of selected positive externalities from road freight transport using cluster and correlation analysis
18 <sup>46</sup> –18 <sup>54</sup>	3.7	<b>Hlatká M., Stopka O., Kolařík P.</b> Proposal of the risk assessment model of vehicle construction systems' safety under the conditions of Industry 4.0
18 <sup>54</sup> –19 <sup>02</sup>	3.8	<b>Kodym O., Kavka L., Hrouda M., Neradilová H.</b> Internet of Things in Automotive Safety
19 <sup>02</sup> –19 <sup>10</sup>	3.9	<b>Kalašová A., Čulík K., Hrudkay K.</b> Perception of Intelligent technologies by Road Users
19 <sup>10</sup> –19 <sup>18</sup>	3.10	<b>Gašparík J., Stokłosa J., Jaśkiewicz M., Bulková Z., Frej D.</b> Measures for increasing safety at level crossings of road communication and railway lines
19 <sup>18</sup> –19 <sup>26</sup>	3.11	<b>Chaba R.</b> Municipal telematics and the idea of a smart city. Intelligent Transport System in modern waste management.
19 <sup>26</sup> –19 <sup>34</sup>	3.12	<b>Piłatowicz R, Luty W., Zdanowicz P.</b> Simulation and experimental assessment of the impact of load balancing system for tandem axles on the vehicle structural safety
19 <sup>34</sup> –19 <sup>42</sup>	3.13	<b>Gidlewski M., Jemioł L., Żardecki D., Zielonka K.</b> Methodology for developing an automatic truck control system during a sudden lane change
19 <sup>42</sup> –19 <sup>50</sup>	3.14	<b>Sterniczuk D., Zaklika W., Kozłowski M.</b> Identification tests of the electromagnetic environment of modern vehicles as part of the assessment of their functional safety

**20<sup>30</sup>****GALA DINNER****THURSDAY****25 APRIL 2024****7<sup>00</sup> – 9<sup>00</sup> BREAKFAST****9<sup>00</sup> – 10<sup>30</sup>****SESSION 5**

9 <sup>00</sup> –9 <sup>15</sup>	<b>Kowalski S.</b> An example of how to improve safety at selected pedestrian crossings
9 <sup>15</sup> –9 <sup>30</sup>	<b>Olejnik K.</b> Analysis and evaluation of the provision of the act on pedestrian crossings on tram tracks
9 <sup>30</sup> –9 <sup>45</sup>	<b>Woś P., Dindorf R.</b> Improving driving comfort and vibration control in vehicles by implementing semi-active seat suspension systems
9 <sup>45</sup> –10 <sup>00</sup>	<b>Żmuda M., Jackowski J.</b> Non-pneumatic tires - analysis of its structure and selected properties
10 <sup>00</sup> –10 <sup>15</sup>	<b>Abramowski M., Fundowicz P., Sar H., Kacprzycki Ł., Brukalski M.</b> Simulation of anti-lock brake system in Matlab/Simulink environment
10 <sup>15</sup> –10 <sup>30</sup>	<b>Dębowski A., Pusty T., Zdanowicz P., Podosek K.</b> Evaluation of the response time of the motorcycle braking system

**10<sup>30</sup>–10<sup>40</sup> SPONSOR PRESENTATION - EC TEST SYSTEMS****10<sup>40</sup>–11<sup>00</sup> COFFEE BREAK**

**11<sup>00</sup>–13<sup>00</sup>****SESSION 6**11<sup>00</sup>–11<sup>15</sup>**Gidlewski M., Jemioł L., Dąbrowski F., Kochanek H.**

The age of passenger car drivers and the risk of accidents

11<sup>15</sup>–11<sup>30</sup>**Turboś F., Konieczny P., Mrowicki A., Madziara S., Stajuda Ł., Šarkan B. Kubiak P., Levchenko D., Meisner N.**

Gaussian Process Regression as a precrash velocity determination method–subcompact vehicle class

11<sup>30</sup>–11<sup>45</sup>**Jackowski J., Radzimierski M.**

A test stand for testing the loads acting on a cyclist during a collision

11<sup>45</sup>–12<sup>00</sup>**Poliak M., Čulík K., Salamakhina E.**

Research on the Impact of the Front Brake Light on Pedestrian Safety

12<sup>00</sup>–12<sup>15</sup>**Dindorf R.**

A study of the damping performance of a hydropneumatic suspension strut designed to ensure safe off-Road driving

12<sup>15</sup>–12<sup>30</sup>**Głąb I., Wszolek T.**

Applying model-based research in noise reduction of Electric Power Steering (EPS) systems in electric vehicles

12<sup>30</sup>–12<sup>45</sup>**Franiasz J., Nakielski M., Machniewicz T.**

Applicability of „steer-by-wire” steering systems in terms of worm gear reliability

12<sup>45</sup>–13<sup>00</sup>**Ziubiński M., Prochowski L.**

How to determine the vehicle's body side deformation characteristic and what results from it?

**13<sup>00</sup>–13<sup>20</sup>****SPONSOR PRESENTATIONS - EC ENGINEERING - HUMANETICS - ESI****13<sup>30</sup>–14<sup>30</sup>****LUNCH****15<sup>00</sup>–19<sup>00</sup>****CRUISE ON THE SANDOMIERZ****19<sup>30</sup>****DINNER****FRIDAY****26 APRIL 2024****7<sup>00</sup>– 9<sup>00</sup>****BREAKFAST****9<sup>00</sup>– 10<sup>45</sup>****SESSION 7**9<sup>00</sup>– 9<sup>15</sup>**Borucka A., Guzanek P., Sobecki G.**

Autonomous Vehicles – Opportunities and Threats

9<sup>15</sup>– 9<sup>30</sup>**Olejnik K.**

Analysis and evaluation of the provision of giving precedence to a pedestrian at a crosswalk on a roadway

9<sup>30</sup>– 9<sup>45</sup>**Ziubiński M., Sz wajkowski P., Prochowski L., Matur T., Osiński O., Zielonka K., Jackowski J.**

The impact of a driving trajectory planning algorithm selection on avoiding a suddenly appearing obstacle by an automated vehicle

9<sup>45</sup>–10<sup>00</sup>**Posuniak P., Jackowski J., Zielonka K.**

Experimental study on crashworthiness of cutting-type energy absorber for rear under run protective devices

10<sup>00</sup>–10<sup>15</sup>**Więckowski D.**

Using logistic mapping to determine the size of the set of autonomous cars in the monitored area

**Frej D.**10<sup>15</sup>–10<sup>30</sup>

The Influence of Changing the Reclining Angle of a Passenger Car Seat on the Trajectory of Movement of a 50th Percentile Male Dummy's Head

10<sup>30</sup>– 10<sup>45</sup>**Wach K., Walczak S.**

Experimental verification of dummy impact simulation in V-Sim 5.0 software

**10<sup>45</sup>–10<sup>55</sup>****SPONSOR PRESENTATION - FORCEPOOL****10<sup>55</sup>– 11<sup>10</sup>****COFFEE BREAK****11<sup>10</sup>– 12<sup>55</sup>****SESSION 8**11<sup>10</sup>–11<sup>25</sup>**Jančár A., Ondruš J., Macurová L., Caban J.**

Alternative devices for measuring the braking characteristics of vehicles

11<sup>25</sup>–11<sup>40</sup>**Tarkowski S., Rybicka I.**

Avoiding an obstacle with a motorcycle - experimental research

11<sup>40</sup>–11<sup>55</sup>**Żardecki D., Dębowski A.**

Sensitivity analysis of the suspension system dynamics model

11<sup>55</sup>–12<sup>10</sup>**Ślaski G., Kupiec J.**

Field observation of the time gap acceptance from an oncoming vehicle when turning left

12<sup>10</sup>–12<sup>25</sup>**Dombrowski P., Jasiński P., Okruch Ł.**

Comparative analysis of the use of classic and light materials in the construction of energy-absorbing structures in vehicles

12<sup>25</sup>– 12<sup>40</sup>**Abramowski M., Fundowicz P., Sar H., Brukalski M.**

Analysis of the braking process for curvilinear motion of automobile

12<sup>40</sup>–12<sup>55</sup>**Dąbrowski F., Grzejszczyk Z, Rzymkowski C., Wiśniewski P.**

Frontal impact energy absorbers for passenger car

**12<sup>55</sup>****CLOSING CEREMONIES****13<sup>00</sup>****LUNCH**

\*) Important notice for Short Session 4 presenters:

Please prepare your presentation (poster) according to the template available on the Conference website.



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**DOFINANSOWANO ZE ŚRODKÓW  
BUDŻETU PAŃSTWA**

**DOSKONAŁA NAUKA II**

Nazwa zadania: „International  
Technical Conference on  
Automotive Safety”

**DOFINANSOWANIE**

**84 000 zł**

**CAŁKOWITA WARTOŚĆ**

**94 000 zł**