

II SCIENTIFIC AND TECHNICAL CONFERENCE

AUTONOMOUS VEHICLES

— challenges and opportunities for the economy and national defence

CONFERENCE PROGRAM

Day I — 27 November 2024

08:00–10:00 Participant registration
10:00–11:50 Opening Session
Welcome to guests:
Witold Luty — Director, Łukasiewicz-PIMOT
Michał Ceremuga — Director, WITPiS
Welcome addresses by honorary guests
Presentation of the institutes:
Witold Luty — Director, Łukasiewicz-PIMOT
Michał Ceremuga — Director, WITPiS
Inaugural presentations:
Artur Dubrawski — Carnegie Mellon University
Col. Tomasz Zaremba — Department of Innovation,
Ministry of National Defence
Coffee break

11:50–12:00

12:00–13:00 Session I — Poster & Technology

POSTERS

- Maciej Osiewicz (Łukasiewicz — Institute of Aviation): Challenges of unmanned aerial systems in autonomous transport.
 - Paweł Harnatkiewicz (KOMES / Military Institute of Armoured and Automotive Technology): Effect of the Rainflow method parameters on cycle-count calculation and extraction of variable-amplitude load-history components in field operational measurements of special vehicles.
 - Leszek Musik (KOMES / Military Institute of Armoured and Automotive Technology): Field tests as the basis for determining loads for immediate and fatigue-strength calculations of a subframe supporting a military special-purpose vehicle adapted for civilian use.
 - Arkadiusz Załęski (Silesian University of Technology): Parametric optimisation of a linear ball bearing with four-point contact in a steer-by-wire steering column using a genetic algorithm.
 - Artur Moradewicz (Łukasiewicz — Institute of Electrical Engineering): Integrated drive system cooperating with an inductive wireless power-supply system.
 - Patryk Dombrowski (Łukasiewicz — Automotive Industry Institute): Implementation of driving functions in autonomous vehicles.
 - Michał Nowicki (Poznan University of Technology): Autonomy of space rovers.
 - Michał Wendeker (Autonomy Now sp. z o.o.): New generation of autonomous systems — overview of AI systems developed in Automotive.
 - Krzysztof Podkowski (SIMCREATEC): Modular EAGLE platform as a basis for building special-purpose, including autonomous and remotely controlled, vehicles.
 - Jarosław Stepień (WiRan sp. z o.o.): Radar and optical sensors on vehicles.
 - Dariusz Bułka (CYBID sp. z o.o. sp. k.): Rail-vehicle automation — technical aspects of prototype tram control.
 - Andrzej Dębowski (Military University of Technology): Scale vehicles as a tool for testing algorithms of highly automated vehicles.
 - Rafał Kurianowicz (Łukasiewicz — EMAG Institute): Role and tasks of the Łukasiewicz — EMAG Institute.
- #### VEHICLE TECHNOLOGY DEMONSTRATIONS
- Łukasiewicz — Automotive Industry Institute: Research platform for testing vehicle automation systems.
 - Łukasiewicz — Automotive Industry Institute: PAWO Autonomous Operational Support Platform.
 - Military Institute of Armoured and Automotive Technology: KUNA.
 - STEKOP S.A. and Military Institute of Armoured and Automotive Technology: TAERO.
 - SIMCREATEC: eVan.
 - Łukasiewicz — Industrial Research Institute for Automation and Measurements PIAP: PIAP HUNTER and PIAP IBIS.
 - Aptiv Services Poland S.A.: Demonstration/test vehicle — BMW iX xDrive40.

13:00–14:00 Lunch break

14:00–15:40 Session II — Plenary

(moderator: Dr hab. Eng. Prof. IES Wojciech Wach)

- Wojciech Wach (Institute of Forensic Research, Kraków): Challenges in reconstructing road accidents in the era of advanced automation.
- Jakub Faryś (Polish Automotive Industry Association): Autonomous vehicles — expectations versus reality.
- Sławomir Lewandowski (Ministry of Infrastructure): Formal and organisational conditions for implementing road automation in Poland.
- Michał Burtowy (Michał Burtowy Law Firm): What do we know about the legal aspects of vehicle traffic automation?
- Jakub Makowski (Łukasiewicz — Automotive Industry Institute): Driving automation systems in the light of type-approval testing.
- Michał Wróblewski (Łukasiewicz — Institute of Innovation and Technology ITECH): Are Poles afraid of autonomous cars? Results of quantitative and qualitative research on social acceptance of the technology.
- Marcin Koziarz (Municipal Office in Jaworzno): The City of Jaworzno's path towards automated transport.

15:40–15:50 Coffee break

15:50–17:30 Session III — Plenary

(moderator: Dr hab. Eng. Prof. — as listed in the original program)

- Grzegorz Ślaski (Poznan University of Technology): Evolution of the role of test tracks in the development of ADAS and CAV systems: examples, challenges, assessment methods and indicators.
- Konrad Małek (Łukasiewicz — Automotive Industry Institute): Autonomy system for unmanned ground vehicles: dual-use in civilian and military applications.
- Michał Polończyk (Autonomous Systems sp. z o.o.): Technology in an autonomous system.
- Patryk Sz wajkowski (Łukasiewicz — Automotive Industry Institute): Road mapping and creation of road-scenario databases for AI models used by automated vehicles to detect obstacles.
- Piotr Bando (Aptiv Services Poland S.A.): The autonomous car's laser eye — challenges and advantages of infrared Vertical Cavity Surface Emitting Laser technology for optical object-tracking systems.
- Michał Nowicki (Poznan University of Technology): New autonomy scenarios for unconventional vehicles using the open-source Autoware software.
- Maciej Dryjański (AVL Software and Functions GmbH, Poland): Technologies and Solutions for Next Generation Military Mobility.

17:30–17:40 Coffee break

17:40–19:20 Session IV — Plenary

(moderator: Prof. Dr hab. Eng. Bogdan Zóltowski)

- Tomasz Pusty (Military Institute of Armoured and Automotive Technology): Sinusoidal steering-wheel excitation as a method for assessing the technical condition of an autonomous vehicle.
- Marcin Wróblewski (CHEMA sp. z o.o. / Military Institute of Armoured and Automotive Technology): Topologies of communication networks for unmanned ground vehicles.
- Patryk Płochocki (Military Institute of Armoured and Automotive Technology): Vehicle Reliability Analysis System as a tool supporting the operation of manned and unmanned military vehicles.
- Marek Nowakowski (Military Institute of Armoured and Automotive Technology): Unmanned vehicle navigation under GPS interference.
- Włodzimierz Kupicz (Military Institute of Armoured and Automotive Technology): Modern equipment and infrastructure for testing unmanned and autonomous vehicles at the Vehicle Research Laboratory.
- Sebastian Jakubowski (Huta Stalowa Wola S.A.): Level 3 autonomy in tracked military vehicles: architecture of a system based on data fusion for military applications.
- Rafał Więckowski (Łukasiewicz — PIAP): Functional testing of the PIAP HUNTER robot during FEX-24.

19:20–20:00 Break

20:00–02:00 Gala dinner

Day II — 28 November 2024

10:00–11:40 Session V — Plenary

(moderator: Prof. Dr hab. Eng. Dariusz Zardecki)

- Dariusz Zardecki (Military University of Technology): Automatic steering of a car in the context of control theory.
- Katarzyna Kijania (Łukasiewicz — Automotive Industry Institute): Effectiveness of autonomous-platform localisation under conditions of limited GNSS.
- Marian Janusz Łopatka (Military University of Technology): Tactical logistics-support platforms.
- Anna Kalbarczyk (Warsaw University of Technology): Innovative surveillance systems for unmanned platforms.
- Mateusz Ziubiński (Military University of Technology): Technology, research and applications of unmanned ground vehicles.
- Daniel Sterniczuk (Łukasiewicz — Automotive Industry Institute): Electromagnetic safety of automated vehicles.
- Janusz Będkowski (Institute of Fundamental Technological Research, Polish Academy of Sciences): Open hardware and open source for creating an environment map for unmanned ground vehicles.

11:40–11:50 Coffee break

11:50–13:45 Session VI — Industry & Promotion

(moderator: Dr hab. Eng. Mariusz Wesłowski)

- Eliza Kotowska (AVL List GmbH, Polish Representative Office): AVL Driveline Test Systems for HD applications.
- Er. Eng. Lipiński (GPS.PL Er. Eng. Lipiński): Navigation in dense urban areas and under GNSS interference. Components for determining a vehicle's geographic position and spatial orientation in the GPS.PL offering.
- Paulina Woroniecka (Łukasiewicz — Institute of Aviation): Łukasiewicz-ILOT capabilities in transport autonomy.
- Piotr Gawęcki (EC TEST Systems sp. z o.o.): Measurement systems offered by EC TEST Systems, used in autonomous-vehicle testing.
- Krzysztof Kulesza (STEKOP S.A.): Unmanned vehicles in difficult terrain.
- Leszek Musik and Paweł Harnatkiewicz (KOMES / Military Institute of Armoured and Automotive Technology): KOMES as an answer to the need for specialised numerical analyses and accredited testing of vehicles and equipment.
- Tomasz Krakówka (Łukasiewicz — PIAP): Łukasiewicz-PIAP mobile robots.
- Krzysztof Królikowski (Forcepol): Forcepol technologies and systems for unmanned ground vehicles.
- Krzysztof Podkowski (SIMCREATEC): Multifunctional, modular, autonomous off-road electric vehicle — design assumptions, application, construction, testing and simulations.

13:45–14:00 Summary and closing of the conference

Witold Luty — Director, Łukasiewicz-PIMOT
Michał Ceremuga — Director, WITPiS

14:00–15:00 Lunch