**2nd International Conference on Smart Automation & Robotics for Future Industry**
**(SMARTINDUSTRY – 2025)**



**Lviv Polytechnic National University,
Ukraine**

**April 03-04, 2025, Lviv, Ukraine**
https://science.lpnu.ua/smartindustry-2025
https://dou.ua/calendar/52974/

# C O N F E R E N C E
# P R O G R A M M E

## Organisers



**Kingston University, London, United Kingdom**



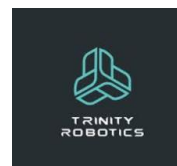**Lviv Polytechnic National University, Ukraine**



**Enterprise of «Electron» engineering corporation**



**Digital services company providing software product design and development services**



**Software Engineering & Product Development Services**



**Manufacturer of custom automated equipment**



**IT solutions provider in Ukraine and Europe**



**Commercial Cleaning Robotics Commercial Cleaning Robotics**



**Center For Professional Education And Personal Growth**



**National Academy of Sciences of Ukraine Institute for Safety Problems of Nuclear Power Plants**

# General SMARTINDUSTRY – 2025 Timetable

| April 03 | |
|---|---|
| 10.00 – 16.10<br><br>Kyiv time | **2nd International Symposium & Workshop on Cobots and Industrial Robots (CIR-2025)**<br>https://us06web.zoom.us/j/86525316161?pwd=JEx9nXDldQy61GPPS1Q8R8asFohSuZ.1<br><br>Lviv Polytechnic National University, S. Bandera, str. 12, Lviv, 79013, Ukraine |
| April 04 | |
| 10.00 – 17.15<br><br>Kyiv time | **2nd International Conference on Smart Automation & Robotics for Future Industry (SMARTINDUSTRY – 2025)**<br>https://us06web.zoom.us/j/86525316161?pwd=JEx9nXDldQy61GPPS1Q8R8asFohSuZ.1<br><br>Tech StartUp School, Akademika Kolessy st, 2, Lviv, Ukraine, 79000 |

TIME FOR PRESENTATIONS

Paper presentation – 7 min.
Discussions and questions – 5 min.



**SMARTINDUSTRY – 2025**

**2nd International Conference on
Smart Automation & Robotics for Future Industry**

# 2nd International Conference on
# Smart Automation & Robotics for Future Industry
## 2nd International Symposium & Workshop on Cobots and Industrial Robots
## (CIR-2025)
## April 3, Session 1

**Chaiperson: PhD Solomiia Liaskovska**

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|---|---|
| 09.00 – 10.00 | Registration |
| 10.00 – 10.05 | **Solomiia Liaskovska**, Organizing Committee Chairperson<br>*Intro speech* |
| 10.05 – 10.10 | **Prof. Natalia Shakhovska**, Director of Institute of Computer Science and Information Technologies at Lviv Polytechnic National University<br>*Welcome speech* |
| 10:10 – 10:15 | **Prof. Andy Augousti** Professor of Applied Physics and Instrumentation at Kingston University, London<br>*Welcome speech* |
| 10:15 – 10:25 | **Dr. Olga Duran**, Head of Department of Mechanical Engineering at Kingston University, London<br>*Welcome speech* |

## Business - Implementation of Smart Technologies: Advantages/Challenges

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|---|---|
| 10:25 – 10:35 | **Oleksand Starodub**, CEO (Spheros - Electron) Member of the Board (Electron PJSC)<br>*Implementation of Smart Manufacturing Methods: Advantages, and Challenges* |
| 10:35 – 10:50 | **Dr.-Ing., Markus Ciupek** \| Executive at Time&Space Ukraine, Entrepreneur & Investor<br>Impact of Smart Technologies on Enhancing Manual Assembly Processes |
| 10:50 – 11:05 | **Vlad Panin**, iFrameAI, USA |
| 11:05 – 11:20 | **David Nichols,** CEO at Qore Technologies<br>*IT Automation as a Way to Provide Modern Solutions to Customers Ready to Leverage Automation for Scaling Their Businesses, Reducing Costs, and Enhancing Customer Experience* |
| 11.20 – 11:35 | **Peyman Nazifi**, Voestalpine \| The voestalpine group is a globally leading technology group and offers top-quality products & system solutions<br>*Artificial Intelligence und Machine Learning in Robotics* |
| 11.35 – 11:50 | **Bohdan Sydor**, Dressx \| A global leader in AI styling<br>Fashion Industry: Existing Challenges and Opportunities in the AI Era |

## 11:50 - 13:00
## Robots exhibition | Coffee Break
## Scince - Scientific Methods in Real Smart Industry Projects
### Session 2

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|---|---|
| 13.00 – 13.15 | **Andrij Petlovannyy,** Global Logic \| digital services company providing software product design and development services<br><br>*Modeling of thermal processes in simulations for surgical robots* |
| 13:15 – 13:30 | **Roman Lysenko,** EPAM \| Software Engineering & Product Development Services<br><br>*Enhancing Adaptive Systems with Intelligent Agents in Microservice Architectures: Opportunities and Challenges* |
| 13:30 – 13:40 | **Nataliia Starostina**, CFO of It Planet Group \| IT solutions provider in Ukraine and Europe |
| 13.40 – 13.55 | **Svitlan Molodychenko**, CEO of Trinity Robotics<br><br>*Demining robot dogs (Unitree)* |
| 13.55 – 14.10 | **Maxim Saveliev** Senior PhD Researcher at Division of Nudear and Radiation Safety Institute for Safety Problems of Nuclear Power Plants, Natiional Academy of Sciences of Ukraine<br><br>*Robotics in Characterization of Radioactive Contamination under Post-Accidental Conditions at Unit 4 of Chornobyl NPP* |

## 14:10-15:00
## University excursion | Coffee Break
## Advancing Engineering Education for Smart Industry: A Comprehensive Approach
### April 3, Session 3

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|---|---|
| 15.00 – 15.05 | **Prof. Nataliia Melnykova,** Head of Artificial Intelligence Department, Lviv Polytechnic National University<br>*Intro speech* |
| 15.05 – 15.20 | **Prof. Oleh Stechkevych**, Doctor of Pedagogical Sciences, Senior Research Fellow, Associate Professor of the Department of Pedagogy and Innovative Education at the Lviv Polytechnic National University<br><br>*Google for Education Certified Trainer* |
| 15.20 – 15.35 | **PhD Nataliia Starodub**, Mentor center<br><br>*Advancing Engineering Education for Smart Industry: A Comprehensive Approach* |
| 15.35 – 15.50 | **Volodymyr Iyatsyshyn,** Founder and CEO at GeeksCode<br>*Why Academia and RnD should be friends* |
| 15.50 – 16.05 | **Eugene Zasoba,** CTO of Somatic<br>*Robotics student as a Formula 1 pilot* |

## Close ceremony

# 2nd International Conference on
## Smart Automation & Robotics for Future Industry
## (SMARTINDUSTRY – 2025)
## April 04

**Chairperson: PhD Solomiia Liaskovska**

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|---|---|
| 09.30 - 10.00 | *Registration* Tech StartUp School *I* Zoom Link |
| 10.00 – 10.05 | Solomiia Liaskovska, Organizing Committee Chairperson<br>*Intro speach* |
| 10.05 – 10.10 | Natalia Shakhovska, Director of Institute of Computer Science and Information Technologies at Lviv Polytechnic National University<br>*Welcome speech* |
| 10.10 – 10.15 | Olga Duran, Head of Department of Mechanical Engineering at Kingston University, London<br>*Welcome speech* |
| 10:15 – 10:20 | Andy Augousti, Professor of Applied Physics and Instrumentation at Kingston University, London<br>*Welcome speech* |
| 10:20 – 10:25 | Nilgün (Dogan) Baydoğan, Professor at Istanbul Technical University, Energy Institute, Istanbul, Türkiye<br>*Welcome speech* |
| 10:25 – 10:40 | Yurii Kryvenchuk, Rostyslav Stupnytskyi, Andriy Shevchuk, Beata Kushka and Iryna Shevchuk<br>*UAV detection with YOLO on a standalone Raspberry Pi 5 system* |
| 10:40 – 10.55 | Arturo Martínez García, Gloria Pérez, Antonio LaTorre, Lorena Cruz, Santiago Muelas and José María Peña<br>*Catalogue of construction materials for Zero Emission Buildings design based on Artificial Intelligence* |
| 10.55 – 11.10 | Alexandr Trunov<br>*Development of a model selection tool based on numerical set analysis for rehabilitation using robotic technologies* |
| 11.10 – 11.25 | Oleksandr Petrovskyi and Yevgen Martyn<br>*Staged Integration of Recurrent Soft Actor-Critic for Bioreactor Control* |
| 11:25 – 11:40 | Victor Sineglazov and Kyrylo Lesohorskyi<br>*Intelligent Hybrid Mobile Robotic Landmine Detection System* |
| 11:40 – 11:55 | Roman Feniak and Yaroslav Vyklyuk<br>*AI-Enhanced Software Architecture Assessment for Cyber-Resilient Industrial Automation Systems* |
| 11.55 – 12.10 | Roman Voliansky, Nina Volianska and Aji Prasetya Wibawa<br>*Interval Mackey-Glass System in the Bipolar Coordinates* |
| 11.30 – 11.40 | Ostap Kuzyk, Oleksandr Prydatko, Andriy Kuzyk and Nazarii Burak<br>*Improving the Streaming Image Quality with LiDAR* |
| 11.40 – 11.50 | Bohdan Dokhniak and Viktor Khavalko<br>*Smart Automation and AI-Driven Optimization in Transport Networks: A Paradigm Shift Towards Sustainable and Efficient Mobility* |
| 11.50 – 12.00 | COFFEE BREAK |
| 12.00 – 12.15 | Yurii Kryvenchuk, Ruslan Doroschuk, Roksolana Sundeha and Volodymyr Shymanskyi<br>*The system of automatic greenhouse care and its informational model* |

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| 12.15 – 12.30 | Valerii Nedilenko, Elena Nyemkova, Mikolaj Karpinski, Yuriy Lakh and Pawel Sawicki<br>*INNOVATIVE METHODS OF CYBER PROTECTION OF INFORMATION SYSTEM FOR A SMART HOUSE* |
| 12.30 – 12.45 | Vitaliy Korendiy, Oleksandr Kachur, Andy Augousti, Olena Lanets, Mykhailo Pylyp and Roman Karpyn<br>*Development and optimization of a pantograph-based robotic gripper for industrial applications* |
| 12.45 – 13.00 | Volodymyr Matsko, Solomiya Lyaskovska and Alexander Starodub<br>*Impact of text preprocessing on effectiveness of document classification by Graph Neural Networks* |
| 13.00 – 13.15 | Alberto Borboni, Luca Ragno and Fabio Zanoletti<br>*Toward Empathetic Human–Robot Interaction: A Multimodal Framework Integrating Psychological Profiling and Emotion Recognition* |
| 13.15 – 13.30 | Pavlo Bratiuk and Leonid Ozirkovskyi<br>*Resolving the issue of incorrect use of the averaging formula for calculating the power of conduction current pulses and how this is relevant to robotics* |
| 13.30 – 13.45 | Alexandr Trunov, Volodymyr Boiko, Yurii Dymytrov, Alexander Pozdnyikov, Hennadii Tereshenko and Volodymyr Mytrokhin<br>*The formulation and solution of the problem of constructing optimal trajectory as a means of eliminating socio-legal contradictions in the realization of unmanned robotic systems* |
| 13.45 – 14.00 | Hlib Shchur and Iryna Dumyn<br>*Usage of Intermediate Fusion of Multimodal Data for Dangerous Objects Enhanced Detection* |
| 14.00 – 14.15 | Taras Cherna and Tetiana Shestakevych<br>*Optimization and Post-Optimization Analysis of the Personnel Structure of Local Self-Government Bodies to Improve the Reintegration of Veterans* |
| 14.15 – 14.30 | Dmytro Dovhal, Natalia Myronova and Anzhelika Parkhomenko<br>*Research on Object Recognition Approaches for Mobile Platforms with Limited Resources* |
| 14.30 – 14.40 | COFFEE BREAK |
| 14.40 – 14.55 | Illia Boryndo and Victor Sineglazov<br>*Multicriteria structural-parametric synthesis of optimal hybrid CNN structure for image processing* |
| 14.55 – 15.10 | Zoriana Dvulit, Liana Maznyk, Kyrylo Maznyk, Lesia Brych, Mariia-Mariana Dvulit, Natalia Iwaszczuk and Aleksander Iwaszczuk<br>*Using Digital Twin (DT) Technology for Workforce Demand Forecasting in the Post-War Reconstruction of Ukraine* |
| 15.10 – 15.25 | Deniz Hande Aydın and Nilgün Baydoğan<br>*Comparative Investigation of the Radiation Attenuation Coefficient of MWCNT and Magnetic Nanoparticle-Reinforced PMMA* |
| 15.25 – 15.40 | Andrii Oliinyk, Maksym Zhmutskyi, Tetiana Kolpakova, Yevgeny Gofman and Matviy Ilyashenko<br>*Blockchain Integration into Digital Twins for Secure and Autonomous Production Systems* |
| 15.40 – 15.55 | Maryna Molchanova, Volodymyr Didur, Olexander Mazurets, Olena Sobko and Oksana Zakharkevich<br>*Method for Construction and Demolition Waste Classification Using Two-Factor Neural Network Image Analysis* |

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| 15.55 – 16.10 | Oleh Pihnastyi, Victoriya Usik and Georgii Kozhevnikov<br>*An analysis of training of a multilayer perceptron for calculating the flow parameters of a conveyor* |
| 16.10 – 16.25 | Vasyl Lytvyn, Ivan Peleshchak, Yurii Futryk, Roman Peleshchak and Andriy Khudyy and Andriy Senyk<br>*An intelligent system for forecasting time series based on a neural network with LSTM-blocks* |
| 16.25 – 16.40 | Roman Kaminsky, Solomiia Liaskovska<br>*Identifying Trends in Non-Stationary Time Series: Comparison of Sliding Window Smoothing Methods* |
| 16.40 – 16.55 | Yaroslav Matviychuk<br>*Improvement of the mathematical models reduction principle by group elements deletion* |
| 16.55 – 17.10 | Hilal Macun Elmali, Nilgün Baydoğan<br>*A theoretical study: radiation shielding features of polymer materials* |

## Close ceremony

# INTERNATIONAL PROGRAM COMMITTEE

## Program Committee Chair

Nataliia Shakhovska, Lviv Polytechnic National University, Ukraine
Andy Augousti, Kingston University, United Kingdom
Olga Duran, Kingston University, United Kingdom

## Program Committee Members

Winfried Auzinger, Vienna University of Technology, Austria

Oleh Barezsky, West Ukrainian National University, Ukraine

Olexander Barmak, Khmelnytskyi National University, Ukraine

Yevgeniy Bodyanskiy, Kharkiv National University of Radio Electronics, Ukraine

Alberto Borboni, University of Brescia, Italy

Jaime Campos, Linnaeus University, Sweden

Ivanna Dronyuk, Jan Dlugosz University in Częstochowa, Poland

Tetiana Hovorushchenko, Khmelnytskyi National University, Ukraine

Ivan Izonin, Lviv Polytechnic National University, Ukraine

Vyacheslav Kharchenko, National Aerospace University KhAI, Ukraine

Iurii Krak, Taras Shevchenko National University of Kyiv, Ukraine

Evgeniy Lavrov, Sumy State University, Ukraine

Solomiya Liaskovska, Lviv Polytechnic National University, Ukraine

Volodymyr Lytvynenko, Kherson National Technical University, Ukraine

Nataliia Melnykova, Lviv Polytechnic National University, Ukraine

Oksana Mulesa, Prešovská univerzita v Prešove, Slovakia

Leszek Rutkowski, AGH University of Science and Technology, Poland

Marco Schmidt, Wurzburg University, Germany

Sergey Subbotin, National University "Zaporizhzhia Polytechnic", Ukraine

Vitaliy Yakovyna, Lviv Polytechnic National University, Ukraine

Mikolaj Karpinski, University of the National Education Commission, Poland