

SCYR 2025

25th Scientific Conference of Young Researchers

11 April 2025

organized by Faculty of Electrical Engineering and Informatics
Technical University of Košice

Conference Programme

- 8:30 – 08:55** **Opening Session**
(University Congress Centre, Technical University of Košice, Letná 9,
Košice, floor no. 0, room between Main building entrance and Aula
Maxima entrance)
- 09:00 – 11:25** Parallel Sessions with presentations:
- Session 1: Electrical Engineering and Physical Engineering**
 (ŠKODA Room, Main TUKE building, 2nd floor)
- Session 2: Artificial Intelligence and Related Topics**
 (University Congress Centre, Room 1)
- Session 3: Computer Science and Software Engineering**
 (University Congress Centre, Room 2)
- 11:30 – 12:30** **Lunch**
(University Congress Centre)
- 12:30 – 13:30** **Conference Awards & Closing Ceremony, Joint Photo Session**
(University Congress Centre)

Conference Sponsors



Section 1: Electrical Engineering and Physical Engineering of Advanced Materials

Room ŠKODA, 2nd floor

Chairmen: Assoc. Prof. Ing. Marek Pástor, PhD. – Head of the committee (FEI TUKE)
 Prof. RNDr. Vladimír Lisý, DrSc. (FEI TUKE)
 Assoc. Prof. Ing. Jaroslav Džmura, PhD. (FEI TUKE)
 Ing. Ján Šepeľa (BSH Drives and Pumps)
 Ing. Alexander Revák (Magna Electronics Slovakia)

Technical Assistant: Ing. Matej Hric

Time	Name	Paper	Paper ID
9:00	Matej Hric	Digital twin of mechatronic system: An Overview	31
9:07	Miroslav Jusko	Overview of Sensors for Biosignal Measurement	12
9:14	Kristián Eliáš	Research on the Possibilities of Increasing the Integration of Renewable Energy Sources into the Electric Power System	18
9:21	Július Šimčák	Dynamic Allocation of Electric Power Capacities	19
9:28	Daniel Gordan	Achieving Maximum Efficiency: Critical Factors for Optimizing Phase-Shifted Full-Bridge (PSFB) Converter	56
9:35	Peter Nemergut	Power Module Packaging Technology Trends	24
9:42	Martin Eliáš	Effect of Magnetic Anisotropies on the Properties of Magnetic Microwires	27
9:49	Kamil Ševc	Photovoltaic Systems and Their Influence on Power System Management	39
Short Cofee Break			
10:10	Lukáš Pancurák	Experimental Validation of Direct Speed Predictive Control	54
10:17	Kristián Glajc	High-Speed Imaging of Streamer Propagation in Nano-Functionalized Transformer Oils	49
10:24	Antónia Kováčová	Sparse Wars: Nyquist Strikes Back	9
10:31	Tomáš Basarik	Decoupling Control of TAB Converter	10
10:38	Simona Saparová	Effect of Halloysite Content on the Quality and Mechanical Properties of Thermoplastic Starch-based Material	20
10:45	Daniel Marcin	Hardware Construction of Capacitor-Based Active Cell Balancer	25
10:52	Leoš Ondriš	Thermal Stability of Thermoplastic Starch Blends with Lignin	53

10:59	Dmytro Miakota	Structural Transitions in Ferronematics Under Electric and Magnetic Fields	26
11:06	Tadeáš Kmecik	Analysis of Improvement Possibilities for Sensorless Control of a BLDC Motor Using AI	5
11:13	Kristina Zolochevska	Shielding Properties and Radiation Modification of Magnetic Nanoparticle-functionalized Textiles	50

Section 2: Artificial Intelligence and Related Topics

University Congress Centre, Room 1

Chairmen: Assoc. Prof. Ing. František Babič, PhD. – Head of the committee (FEI TUKE)
Ing. Juraj Bujňák, PhD. (Siemens Healthineers)
Ing. Martin Čertický, PhD. (Caterpillar Slovakia)
Assoc. Prof. Eva Chovancová, PhD. (FEI TUKE)
Assoc. Prof. Stanislav Ondáš, PhD. (FEI TUKE)
Assoc. Prof. Matúš Pleva, PhD. (FEI TUKE)

Technical Assistant: Ing. Viliam Balara

Time	Name	Paper	Paper ID
9:10	Viliam Balara	Multimodal Detection of Toxic Behavior in Social Media	43
9:17	Jozef Badár	Artificial Intelligence in Routing for Mobile Multi-Hop Networks in 6G: A Comprehensive Review	17
9:24	Kristián Sopkovič	Data Augmentation with Large Language Models for Minority Languages: A Review	36
9:31	Miroslav Imrich	Optimizing Wireless Robotics Using NeRF and RIS	22
9:38	Lukáš Tomaščík	Current Trends in Modeling and Simulation of Complex Physical Systems with Neural Networks	3
9:45	František Kurimský	Electricity Price Prediction: Overview, Data Analysis and Future Research	47
9:52	Richard Král	Design and Implementation of a Device for Supporting the Visually Impaired with a Focus on Spatial Orientation	13
Short Coffee Break			
10:10	Miroslav Murin	Phishing Vishing and Deepfake Attacks in the Context of Emerging Cyber Threats	46
10:17	Eva Kupcova	Applications of Homomorphic Encryption in Biometric Data Protection	28
10:24	Maroš Krupáš	Human-Machine Collaboration and Artificial Intelligence in Industry 5.0	42
10:31	Ľubomír Urblík	Exploring the Potential of Docker for Edge AI and IoT Applications	44
10:38	Lenka Kališková	Analysis of Multiple Machine Learning Approaches in Astrophysics	51
10:45	Róbert Rauch	Split Computing and Early Exiting for Computer Vision Tasks in Autonomous Vehicles	33
10:52	Ladislav Hric	Object Detection Systems for Unmanned Aerial Vehicles	2

Section 3: Computer Science, Software Engineering and Related Topics

University Congress Centre, Room 2

Chairmen: Assoc. Prof. Emíla Pietriková, PhD. – Head of the committee (FEI TUKE)
 Ing. Tibor Gujdán (FPT Slovakia)
 Assoc. Prof. Peter Papcun, PhD. (FEI TUKE)
 Assoc. Prof. Ing. Peter Feciľak, PhD. (FEI TUKE)
 Assoc. Prog. Ján Papaj, PhD. (FEI TUKE)

Technical Assistant: Ing. Nikola Geciová

Time	Name	Paper	Paper ID
9:10	Marek Horváth	Programmer Identification Based on Source Code Stylometric Analysis and Behavioral Biometrics	6
9:17	Nikola Geciová	Optimization of Discrete-event Systems	8
9:24	Lenka Bubeňková	Cybersecurity Awareness Through Gamification	34
9:31	Jaroslav Marko	Intrusion Detection Systems and Attack Graphs	29
9:38	Renáta Rusnáková	Solving Optimization and Search Problems Using D-Wave Systems' Quantum Annealer	14
9:45	Dominika Líšková	Modelling and Analysis of Cyber-Physical Systems	15
9:52	Tomáš Buček	Automated Knowledge Evaluation in Software Engineering Disciplines	35
Short Coffee break			
10:10	Erika Abigail Katonová	Innovations and perspectives in Software-Defined Networking	48
10:17	Ivana Nováková	Advanced Physical Approaches to Presenting Physical Phenomena Using AR	56
10:24	Samuel Novotný	Implementation Potential of Transparent Intensional Logic in Multi-Agent System Communication	37
10:31	Miroslava Matejová	Use of XAI Methods and Its Evaluation in Various Domains	30
10:38	Peter Pekarčík	Implementation of PQC algorithm for IoT devices	7
10:45	Martin Nguyen	Correlation Between AMS-02 Data and Space Weather Parameters for Machine Learning Prediction	23
10:52	Tomáš Kormaník	Towards IoT Education Evolution	4