

**SCYR 2026**  
**26th Scientific Conference of Young Researchers**  
**17 April 2026**

organized by Faculty of Electrical Engineering and Informatics  
Technical University of Košice, Congress Centre TUKE

# Conference Programme

Version: 14 April 2026



*The conference organizers reserve the right to modify or make minor adjustments to the program at any time.*



# Organizers and Sponsors



TECHNICAL UNIVERSITY OF KOŠICE  
Faculty of Electrical Engineering  
and Informatics



# Section 1: Electrical Engineering and Physical Engineering of Advanced Materials

## University Congress Centre, Lecture Room 1

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

**Technical Assistant:** Ing. Peter Šofranko – Dept. of Electrical Engineering and Mechatronics  
[peter.sofranko@tuke.sk](mailto:peter.sofranko@tuke.sk)

Time	Author	Paper Title	ID
9:00	František Margita	Weather-Based Spatial Dynamic Line Rating of Overhead Transmission Lines Using a CIGRE 601 Thermal Model	4
9:06	Tomáš Basarik	Decoupling Control of Five-Port MMAB Converter Based on the Newton-Raphson Method	41
9:12	Ardian Hyseni	Convolutional NN and Benford's Law in Electricity Network Anomaly Detection	50
9:18	Daniel Gordan	Pushing PSFB technology to 500 kHz: What is gained and what is lost?	42
9:24	Antónia Kováčová	Sparse Wars - Return of Donoho	56
9:30	Tadeáš Kmecik	Analysis, Identification, Modeling and AI-Based Compensation of Cogging Torque	60
9:36	Marek Bobček	Shadow Layer Protection: A Software-Defined Superstructure for Resilient Smart Grid Infrastructure	68
9:42	Peter Nemergut	Sb-Based Solders for Large-Area Joints in Power Electronics: Reflow Profile Optimization	31
9:48	Richard Král	Towards Affordable Wearable 3D LiDAR Navigation Assistance: Scanner Design and Calibration	57
9:54	Miroslav Jusko	Analog Frontend for Measuring Bioimpedance	36
10:00	Matej Hric	Possibilities of Using Digital Twin for Flying Shears	58
<b>Short Coffee Break</b>			
10:15	Jerguš Ševce	Reconstructive Approach for Wearable Blood Pressure Monitoring	9
10:21	Erik Podracký	Optimization of mild-hybrid drive: An Overview	1

10:27	Vladimír Szomosi	Impact of V2G on Smart Grid	14
10:33	Matej Vaľko	Temperature and Pressure Effects on Breakdown in Nanofluids	26
10:39	Filip Mahdal	A Review of Ultra-Wideband Antennas on Paper-Based Substrates	33
10:45	Samuel Onufer	Switching Field and Magnetoelastic Properties of Amorphous kGlass-Coated Microwires	47
10:51	Roland Molnár	Bidirectional DC/DC Converters: An Overview	44
10:57	Ľubomír Pallaj	Machine Learning Approaches for Partial Discharges Classification in High-Voltage Equipment	51
11:03	Norbert Rešovský	Solid-State Transformers in AC-Fed Locomotives: Overview and Future Developments	69
11:09	Miroslav Komorník	Analysis of Monitoring Internal Forces in SingleLap Adhesive Joints Using Magnetic Microwire Sensors	65
11:15	Peter Šofranko	Sensorless PMSM Control via High-Frequency Signal Injection: Principles and Methods	46

## Section 2: Artificial Intelligence and Related Topics

### University Congress Centre, Lecture Room 2

**Chairmen:** Assoc. Prof. Peter Papcun, PhD. – **Head of the committee** (FEEI TUKE)  
Assoc. Prof. Stanislav Ondáš, PhD. (FEEI TUKE)  
Assoc. Prof. Martin Sarnovský, PhD. (FEEI TUKE)  
Ing. Juraj Bujňák, PhD. (Siemens Healthineers)  
Ing. Martin Čertický, PhD. (Caterpillar Slovakia)

**Technical Assistant:** Ing. Juraj Kováč – Dept. of Computer Networks

[juraj.kovac.3@tuke.sk](mailto:juraj.kovac.3@tuke.sk)

Time	Author	Paper Title	ID
9:00	Matúš Dopiriak	Adaptive Sensor Fusion for Semantic Corner Case Detection Using Agentic AI	30
9:06	Martin Nguyen	Automated Detection of Aurora Borealis in Mid-Latitudes Using Public Camera Networks	35
9:12	Viliam Balara	Detection of AI-Generated Essays	16
9:18	Miroslav Murin	A Multimodal Deep Learning Framework for Detecting Hoaxes and Fake Images in the Digital Environment	38
9:24	Sylvia Maťašová	Research and Development of Artificial Intelligence for Indexing and Structuring Medical Data	25
9:30	Jozef Badár	Artificial Intelligence for Routing in 6G Mobile Multi-Hop Networks: A Progress Report and Comparative Study	5
9:36	Zuzana Liščinská	Hybrid FSO/RF Link Management Using RSSI Prediction and Reinforcement Learning	19
9:42	Ladislav Hric	Augmentation method for robust UAV-based Military Object Detection	3
9:48	Kristián Sopkovič	Morphological and Syntactic Analysis of Synthetic Questions Generated by LLM Models for Slovak Wikipedia	62
9:54	Michal Stromko	Autonomous Knowledge Synthesis: Multi-Agent Methodology for Systematic Scientific Literature Analysis	13
10:00	Peter Demeter	Multimodality of Transformer-Based Models for Toxicity Detection in Online Games and Social Networks	21
<b>Short Coffee Break</b>			
10:20	Chris Uličný	Joint Split Computing and Early Exiting for Adaptive Transformer Inference in Vehicular Edge Environments	23
10:26	Simona Chovancová	Challenges and Future Directions for Explainable AI in Medical Imaging	24
10:32	Samuel Fodor	Deep learning methods for natural language processing	39
10:38	Michaela Leľová	Multi-Agent Reinforcement Learning in Energy Markets: State and Outlook	43

10:44	Branislav Setlák	Computer Vision Foundation Models in Medical Imaging	52
10:50	Alex Krempaský	Large Language Models in Energy Commodity Trading	49
10:56	Sebastián Hreško	Dysarthric Speech Detection in Parkinson's Disease Patients Using Foundation Models and Domain Generalization Techniques	55
11:00	Juraj Kováč	Current State and Innovative Concepts in Technological Support for Diagnosis and Therapy of Speech and Hearing Disorders	20

## Section 3: Computer Science, Software Engineering and Related Topics

**Meeting Room of FEEI, 2nd floor of TUKE Main Building**

**Chairmen:** Assoc. Prof. Matúš Pleva, PhD. – **Head of the committee** (FEEI TUKE)  
 Assoc. Prof. Emília Pietriková, PhD. (FEEI TUKE)  
 Assoc. Prof. Norbert Ádam, PhD. (FEEI TUKE)  
 Assoc. Prof. Ing. Peter Feciľak, PhD. (FEEI TUKE)  
 Ing. Tibor Gujdán (FPT Slovakia)

**Technical Assistant:** Ing. Daniel Šolc – Dept. of Computers and Informatics  
[daniel.solc@tuke.sk](mailto:daniel.solc@tuke.sk)

Time	Author	Paper Title	ID
9:00	Ivana Nováková	Bayesian Multi Sensor AMP-vSLAM for Robust Industrial AR	29
9:06	Eva Kupcová	Privacy-Preserving Biometric Authentication Using Advanced Cryptographic Techniques	8
9:12	Tomáš Buček	Quantifying Student Contributions in Collaborative Programming Projects Through Advanced Git-Based Metrics	40
9:18	Marek Horváth	Decomposing the Programmer Attribution Problem in Educational Source Code	45
9:24	Erika Katonová	Dynamic Routing QoS-Guaranteed Software Defined Network Architecture	63
9:30	Tomáš Kormaník	Analysis of IoT Landscape in Education	66
9:36	Samuel Novotný	Transparent Intensional Logic from a Programming Language Perspective	67
9:42	Renáta Rusnáková	Quantum Annealing in Traffic Management & Quantum-ML Synergy	6
9:48	Jaroslav Marko	Multi-Metric Patch Prioritization for Small Networks Using Attack-Graph Context	27
9:54	Dominika Líšková	Contribution to Modelling and Analysis of Cyber-physical Systems within the Framework of the ALICE Detector Control System	59
10:00	Peter Popřík	Towards Procedural Generation of Degraded Content Using Hierarchical Data Structures	54
<b>Short Coffee Break</b>			
10:20	Dušan Čatloch	Malware Threat Detection Using Machine Learning Methods	7
10:26	Svitlana Syzranova	A Survey of Anomaly Detection Techniques for Distributed IT Systems	22
10:32	Timotej Sobota	Advanced XR Technologies, their Implementation Environments, and Applications	28

10:38	Monika Kohútová	State Representation in Domain-Specific Languages: A Review of Semantic Models	34
10:44	Tomáš Danko	Efficient Hardware Acceleration of Deep Neural Networks: A Review	2
10:50	Nazarii Herasymchuk	Using visualizations to increase teaching effectiveness in the field of algorithms and data structures	37
10:56	Daniel Šolc	Scene Understanding and Corner-Case Handling in Autonomous Driving: A Review	10

*The conference organizers reserve the right to modify or make minor adjustments to the program at any time.*