SLOVENIAN CONFERENCE ON ARTIFICIAL INTELLIGENCE
SLOVENSKA KONFERENCA O UMETNI INTELIGENCI

Wednesday, 8th October 2025 / Sreda, 8. oktober 2025

Great Lecture Hall / Velika predavalnica

Link for online attendance / Povezava za spletno udeležbo:
https://zoom.us/j/98279535600

9:00 – 10:10	**Conference opening / Otvoritev konference** **Chair / Vodi: Matjaž Gams** • **Opening address / Pozdravni nagovor** **Mojca Štruc**, Director-general of the Digital Society Directorate of Republic of Slovenia / generalna direktorica Direktorata za digitalno družbo Republike Slovenije • **Keynote / Vabljeno predavanje:** **Eva Tuba** Automated Optimization and Machine Learning: Challenges and Opportunities in AI Research *Artificial Intelligence has reached a stage where automated methods are increasingly needed to manage its own complexity. Automated Machine Learning (AutoML) and Automated Optimization (AutoOPT) aim to reduce the human effort in tasks such as model design, hyperparameter tuning, and algorithm configuration, while enabling scalable and domain-independent applications. This talk will survey recent progress in automated approaches and discuss the challenges of balancing automation with performance, generalization, and interpretability. The presentation will connect ongoing advances with open research questions. The presenter is the ERA Chair Holder of the AutoLearn-SI project recently started at Jožef Stefan Institute.*
10:10 – 11:00	**Session A / Sekcija A** **Chair / Vodi: Jure Žabkar** • **Marko Bohanec, Uroš Rajkovič and Vladislav Rajkovič** Utilizing Large Language Models for Supporting Multi-Criteria Decision Modelling Method DEX • **Mariša Ratajec, Anton Gradišek and Nina Reščič** Mapping medical procedure codes using language models • **Junoš Lukan, Maori Inagawa and Mitja Lustrek** Extracting Structured Information About Food Loss and Waste Measurement Practices Using Large Language Models: A Feasibility Study
11:00 – 11:30	**Break / Odmor**

11:30 – 13:00	**Session B / Sekcija B** **Chair / Vodi: Maj Smerkol** • **Rok Rajher and Jure Žabkar** Automated Explainable Schizophrenia Assessment from Verbal-Fluency Audio • **Mila Marinković and Jure Žabkar** Eye-Tracking Explains Cognitive Test Performance in Schizophrenia • **Zoja Anžur, Gašper Slapničar and Mitja Luštrek** Thermal Camera-Based Cognitive Load Estimation: A Non-Invasive Approach • **Matej Jelenc, Miljana Shulajkovska, Rok Jurič and Anton Gradišek** Prediction of Root Canal Treatment Using Machine Learning • **Nina Reščič, Marko Jordan, Sebastjan Kramar, Ana Krstevska, Marcel Založnik, Lotte van der Jagt, Harm Op den Akker, Martijn Vastenburg, Valentina Di Giacomo, Elena Mancuso, Dario Fenoglio, Gabriele Dominici and Mitja Luštrek** SmartCHANGE Risk Prediction Tool: Next-Generation Risk Assessment for Children and Youth
13:00 – 14:00	**Lunch break / Odmor za kosilo**
14:00 – 15:30	**Session C / Sekcija C** **Chair / Vodi: Aljaž Osojnik** • **Estefanía Žugelj Tapia, Borut Kirn and Sašo Džeroski** Interpretable Predictive Clustering Tree for Post-Intubation Hypotension Assessment • **Blaž Dobravec and Jure Žabkar** Explaining Deep Reinforcement Learning Policy in Distribution Network Control • **Primoz Kocuvan, Vinko Longar and Rok Struna** Predictive Maintenance of Machines in LABtop Production Environment • **Vid Nemec, Gašper Slapničar and Mitja Luštrek** Data-Driven Evaluation of Truck Driving Performance with Statistical and Machine Learning Methods • **Alex Romanova** GNN Fusion of Voronoi Spatial Graphs and City–Year Temporal Graphs for Climate Analysis

15:30 – 16:00	**Break / Odmor**
16:00 – 17:00	**Session D – student papers / Sekcija D – študentski prisevki** **Chair / Vodi: Bogdan Filipič** • **Anna-Katharina Herke** Leveraging AI in Melanoma Skin Cancer Diagnosis: Human Expertise vs. Machine Precision • **Nina Rechberger** AI-Enabled Dynamic Spectrum Sharing in the Telecommunication Sector – Technical Aspects and Legal Challenges • **Žiga Kolar, Thibault Comte, Yanny Hassani, Hugues Louvancour and Matjaž Gams** Machine Learning for Cutting Tool Wear Detection: A Multi-Dataset Benchmark Study Toward Predictive Maintenance
17:00 – 17:15	**Break / Odmor**
17:15–18:45	**Special session Beyond Human Art / Posebna sekcija Onkraj človeške umetnosti** **Chair / Vodi: Denis Trček** • **Penousal Machado** Lecture on evolutionary art / Predavanje o evolucijski umetnosti • **Oskar Slabe, Nejc Trampuž in Matej Mihevc** Discussion on AI and art/ Pogovor umetni inteligenci in umetnosti *This session will focus on art in the age of flourishing generative artificial intelligence. The session will be opened with a short online lecture by Prof. Penousal Machado, who often lectures on evolutionary computation, visualization, and art, and whose works have been presented, for example, in Wired magazine and the Museum of Modern Art, New York (MoMA). The second part of the event will be a discussion with young Slovenian artists who use artificial intelligence in their work. Oskar Slabe, Nejc Trampuž, and Matej Mihevc will take part to discuss the opportunities and challenges that (generative) artificial intelligence brings for art and artists*

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https://zoom.us/j/98214582843

9:00 – 10:00

Special session on Slovenian AI Factory (SLAIF) / Posebna sekcija o Slovenski tovarni umetne inteligence

Chair / Vodi: Mitja Luštrek

- **Sašo Džeroski**

Artificial Intelligence for Science and Society: From Innovation to Infrastructure

AI has moved from being a niche research curiosity to becoming an indispensable component of modern science and a foundational element of digital infrastructure. The talk will explore two interrelated perspectives on AI's role in the immediate future. First, I will give an overview of our work in developing AI methods specifically suited for scientific discovery. These include approaches for explainable machine learning that balance predictive accuracy with scientific insight; strategies for learning from limited data, including semi-supervised learning and foundation models; and the role of ontologies and semantic technologies in supporting open, reproducible science by formalising and sharing scientific knowledge, data, and computational artefacts. Second, I will discuss AI as a national-scale infrastructure through the lens of SLAIF, which I coordinate technically. SLAIF will provide computing resources, tools, and expertise to a wide spectrum of users, from researchers to public institutions and industry. By integrating AI into the very fabric of scientific and societal operations, we are moving towards a future where AI is as essential and ubiquitous as electricity or the internet. I will argue that the transition from AI as innovation to AI as infrastructure is not just a technological evolution. It is a societal transformation. As such, it requires thoughtful design, broad accessibility, and deep collaboration between science, policy, and practice.

- **Gašper Slapničar**

From Pixels and Tokens to Heartbeats and Brainwaves: Foundation Models for Sensor Data

In this talk we will take a look at how the "foundation model" paradigm that transformed computer vision and NLP is now crossing a critical threshold into sensor signals. In many sensor-based data, long-range temporal structure, noise, and heterogeneity – as evident in biosignals, such as PPG, ECG, EEG and others – demand pretraining at population scale and careful alignment to clinically meaningful semantics. We will review some examples of early wearable-focused pretraining (e.g., large self-supervised models on consumer PPG/ECG/EEG) that showed strong scaling and performance on a variety of problems, paving the way for truly general use of such models on any downstream task. Recently a new generation of hybrid sensor-language models that explicitly couple raw time-series to natural language, enabled intuitive signal "understanding", as exemplified by Google's SensorLM, trained to "speak" the language of sensors. This shift reframes biosignal understanding as a language-grounded modeling problem, opening pathways for safer adaptation, clinical validation, and transparent interaction with both practitioners and non-experts.

10:00 – 11:00	**Session A / Sekcija A** **Chair / Vodi: Marcel Založnik** • **Žan Ambrožič, Lorenzo Bianco, Rok Šturm, David Susič, Maj Smerkol and Anton Gradišek** Detecting Pollinators from Stem Vibrations Using a Neural Network • **Ryo Yagi, David Susič, Maj Smerkol, Miha Finžgar and Anton Gradišek** Development of a Lightweight Model for Detecting Solitary-Bee Buzz Using Pruning and Quantization for Edge Deployment • **David Susič, Maria Luisa Buchaillot, Miguel Crozzoli, Calum Builder, Sevasti Maistrou, Anton Gradišek and Dragana Vukašinović** Towards Anomaly Detection in Forest Biodiversity Monitoring: A Pilot Study with Variational Autoencoders
11:00 – 11:30	**Break / Odmor**
11:30 – 12:15	**Session B / Sekcija B** **Chair / Vodi: Gašper Slapničar** • **Jordan Cork, Andrejaana Andova, Pavel Krömer, Tea Tušar and Bogdan Filipič** Landscape-Aware Selection of Constraint Handling Techniques in Mulitobjective Optimisation • **Fatemeh Azad and Matjaž Kukar: A Critical Perspective on MNAR Data** Imputation, Generation, and the Path Toward a Unified Framework **Best paper award presentation /** **Podelitev nagrade za najboljši prispevek**