



**Wednesday, November 13<sup>th</sup>, 2024**

**Registration of participants**

08.00-12.00

Tatra Hotel – Registration point

**Conference opening**

09.15

**Plenary session – Invited lectures**

09.30-11.00

*Chair: William Steingartner*

Caterina Urban

*Formal Methods for Machine Learning*

Hanspeter Mössenböck

*Dynamic Compiler Optimizations in the Graal VM*

**Coffee break**

11.00-11.20

**Lunch**

13.00-14.00

**Regular sessions**

11.20-13.00 and 14.00-18.00

**Welcome Dinner**

19.00

**Wednesday, November 13<sup>th</sup>, 2024**

## **Session A**

### **E-Learning and Online Education**

11.20-13.00

*Chair: Paweł Kossecki*

11.20-11.40 Matuš Miklovič, Eduard Kuric, Pavol Baťalík and Ján Lang

*Transforming Community Q&A System Content into Learning Objects*

11.40-12.00 Neven Pintarić and Željka Tomasović

*Assessing the Quality of Digital Objects in the Context of Open Science*

12.00-12.20 Petr Šaloun, Tereza Simkova, Lukas Tomaszek, Milan Klement, Lucie Bryndová and William Steingartner

*Morning Circle Web Application for Children with Autistic Spectrum Disorder*

12.20-12.40 Davorka Radaković and William Steingartner

*Why Female Pupils Lose Interest in Stem Fields in High School with an Emphasis on Computer Science?*

12.40-13.00 Štefan Korečko, Branislav Sobota and Juraj Rudy

*Assessing Comprehension of Petri Nets Across Diverse Backgrounds: An Experimental Insight*

13.00-14.00 Lunch

### **Ethical Issues in Informatics**

14.20-15.20

*Chair: Sabina Szymboniak*

14.20-14.40 Milan Klement, Lucie Bryndová and Květoslav Bártek

*Computer gambling and its incidence in children and adolescents*

14.40-15.00 Machteld Combé and Neeltje Pavičić  
*Matching tech solutions to the needs of marginalised citizens*

15.00-15.20 William Steingartner, Darko Galinec and Vinko Zebić  
*Challenges of Application Programming Interfaces Security: A Conceptual Model in the Changing Cyber Defense Environment and Zero Trust Architecture*

15.20-15.40 Coffee break

## **Theoretical Computer Science**

15.40-18.20

*Chair: Peter Csaba Ölveczky*

15.40-16.00 Wolfgang Schreiner and William Steingartner  
*Semantics-Based Rapid Prototyping of a Machine Controller Language*

16.00-16.20 Gabor Sági  
*On the Expressive Power of First Order Logic Extended with the Betweenness Relation*

16.20-16.40 Samuel Novotný, William Steingartner and Ján Perháč  
*Another Empirical Proof of Transparent Intensional Logic's Expressive Power in the Field of Temporal Logical Systems*

16.40-17.00 Richard Jurko, Ján Perháč and Samuel Novotný  
*Type Checker for Simply Typed Lambda Calculus*

17.00-17.20 Elena Akik, Marko Vještica, Vladimir Dimitrieski, Milan Čeliković and Sonja Ristić  
*Prototype of Domain-Specific Language for Uniform Access to Vector Databases*

17.20-17.40 Jaroslav Drozd, Pavol Bat'álik and Ján Lang  
*Efficiency of Algorithms and Input Processing Methods in Slovak Text Data Retrieval*



17.40-18.00 Václav Skála

*A New Projective Point-in-Convex Polygon Test with  $O(\log N)$  Complexity*

**Wednesday, November 13<sup>th</sup>, 2024**

**Session B**

**Emerging Technologies**

11.20-13.00

*Chair: Michal Kvet*

11.20-11.40 Veronika Sedláková, Radovan Hudák, Norbert Ferenčík and Peter Kneppo

*Development and Prototyping of an Arduino UNO System for Studying Light Effects on Mesenchymal Stem Cell*

11.40-12.00 Ondrej Kainz, Miroslav Michalko, Miroslav Murin, Ivana Nováková, Tomáš Frankovič, Tomáš Tóth and Ervín Šimko

*Autonomous Control of an UAV in a Virtual Environment Using Machine Learning and Pathfinding*

12.00-12.20 Michal Kubaščík, Ján Šumský, Andrej Tupý and Tomáš Bača

*OTA firmware updates on ESP32 based microcontrollers*

12.20-12.40 Tomáš Balint, Jozef Živčák, Miroslav Kohan, Norbert Ferenčík and Petra Kolembusová

*Analysis of samples printed using additive FFF technology from recycled and non-recycled polymer-based filament*

12.40-13.00 Max Sauer, Jonas Thessen and Simone Braun

*Digital Sovereignty: Requirements of Digital Identity Wallets in E-Commerce*

13.00-14.00 Lunch

## **Smart Cities and Urban Technologies**

14.20-15.20

*Chair: Petr Šaloun*

14.20-14.40 Michal Janovec, Jozef Papán and Michal Hraška

*Review of security threats and existing solutions for securing WSNs*

14.40-15.00 Martin Antl, Emilia Pietrikova and Peter Poór

*Intelligent Urban Traffic Management Systems - Takeaways from Martin City*

15.00-15.20 Viktor Beneš, Miroslav Svítek, Alžbeta Michalíková and Miroslav Melicherčík

*Investigating the impact of meteorological and traffic flow conditions on emissions*

15.20-15.40 Coffee break

## **Artificial Intelligence and Machine Learning**

15.40-18.00

*Chair: Davorka Radaković*

15.40-16.00 Peter Krammer, Ondrej Habala and Ladislav Hluchý

*Anomaly Detection Method Using Statistical Distribution Identification*

16.00-16.20 Martin Pozdílěk and Alena Pozdílková

*Phonetic Analysis of Queen Elizabeth's Christmas Messages*

16.20-16.40 Dejana Gladić, Jelena Petrovački, Srđan Sladojević, Marko Arsenović and Sonja Ristić

*IDS-based Machine Learning Model Specific for Secure Data Transmission within the Frame of IoT Network Infrastructure*

16.40-17.00 Andrea Galadíková and Branislav Časnocha

*Using simulated annealing for personnel assignment in railway nodes*

17.00-17.20 Nora Pireci Sejdiu, Nikola Rendeovski and Blagoj Risteovski

*AI Revolutionising 5G and Next-Generation Networks*



17.20-17.40 Dmytro Kovalenko and Dušan Marcek

*Integrating Advanced Neural Network Technologies: A New Opportunity for Economic Time Series Forecasting*

17.40-18.00 Md. Rajaul Karim, Mm Mahbubul Syeed, Kaniz Fatema, Shakhawat Hossain, Razib Hayat Khan and Mohammad Faisal Uddin

*AnxPred: A Hybrid CNN-SVM Model with XAI to Predict Anxiety among University Students*

**Wednesday, November 13<sup>th</sup>, 2024**

## **Session C**

### **Software Engineering**

11.20-13.00

*Chair: Wolfgang Schreiner*

11.20-11.40 Patrícia Járosiová and Sergej Chodarev

*The Impact of Unit Test Quality on Software Development: Controlled Experiment*

11.40-12.00 Konrad Nadobny

*Applying enterprise architecture modeling to identify technical dependencies in context of transforming legacy system landscapes*

12.00-12.20 Gábor Tóthvári, Kristóf Umann and Zoltán Porkoláb

*Finding bugs on tagged unions mismatches*

12.20-12.40 Martin Mazuch, Alexander Brezani and Jozef Kostolny

*Spherical Graph Layout for Force-Directed Algorithms*

12.40-13.00 Michal Mrena, Patrik Rusnak and Miroslav Kvassay

*Algorithms for Computation of Topological Measures Based on Binary Decision Diagrams*

13.00-14.00 Lunch

### **Software Engineering**

14.20-15.20

*Chair: Hanspeter Mössenböck*

14.20-14.40 Michal Mrena, Michal Varga and Miroslav Kvassay

*Comparison of the Approaches to the Traversal of a Binary Tree Structure Using Iterators*



14.40-15.00 Michal Rozsival, Aleš Smrčka and Tomáš Vojnar  
*Automated Testing of Reliability of Networked Systems*

15.00-15.20 Petr John, Kristýna Zaklová, Juraj Lazúr, Jiří Hynek and Tomáš Hruška  
*A Self-Hosted Approach to Automatic CI/CD Using Open-Source Tools on Low-Power Devices*

15.20-15.40 Coffee break

## **Digital Health and Telemedicine**

15.40-16.40

*Chair: Gabriela Nečasová*

15.40-16.00 Michal Kubaščík, Ján Šumský, Andrej Tupý and Tomáš Bača  
*6-channel band for advanced myoelectric signal analysis*

16.00-16.20 Marek Klimo, Miroslav Kvassay and Nika Kvassayova  
*Development of Male Skeletal 3D Model for Applications in Medicine*

16.20-16.40 Qiaolin Zhang, Hairong Chen and István Bíró  
*Effects of different schemes of hallux valgus osteotomy on the stress based on computer digital simulation*

## **Cybersecurity**

16.40-18.00

*Chair: Petr Veigend*

16.40-17.00 Sabina Szymoniak and Kacper Foks  
*Role of Open Source Intelligence Methods in Cybersecurity*

17.00-17.20 Marek Šimon, Ladislav Huraj and Dominik Hrinkino  
*Home Assistant platform under DDoS attacks for IPv4 and IPv6 networks*

17.20-17.40 Olga Siedlecka-Lamch  
*Blockchain-Enabled Data Model for Medical Diagnoses: Supporting Physician Collaboration*



17.40-18.00 Dawid Witczak and Sabina Szymoniak  
*A Survey on IoT-Based Monitoring and Control Technologies*

**Thursday, November 14<sup>th</sup>, 2024**

**Plenary session – Invited lectures**

08.00-9.45

*Chair: William Steingartner*

Valentino Vranić

*Drama and Software Patterns*

Peter Csaba Ölveczky

*Design and Validation of Cloud Transaction Systems using Formal Methods*

**Workshop – Parallel activity**

09.00-9.45

Aleksandra Vranić and Valentino Vranić

*Understanding Design Patterns Through Drama Metaphors*

**Coffee break**

9.45-10.00

**Regular sessions**

10.00-12.20

**Lunch**

12.30

**Trips**

13.15 Trip A – *Museum of Liptov Village in Pribylina*

Trip B – *Museum in Poprad*

**Banquet**

19.00

**Thursday, November 14<sup>th</sup>, 2024**

## **Session A**

### **Computer Vision and Image Processing**

10.00-10.40

*Chair: Adam Dudáš*

10.00-10.20 Jakub Oravec, Ľuboš Ovseník, Zuzana Liščinská and Samuel Andrejčík

*Evaluating Statistical Properties of Keys in Image Encryption Algorithms*

10.20-10.40 Radek Matoušek

*Accurate contactless measurement of triangular objects composed of 3D point clouds of low quality and unclear rotation*

### **Applied Informatics**

10.40-12.20

*Chair: Olga Siedlecka-Lamch*

10.40-11.00 Mariusz Przybylik and Paweł Kossecki

*Key criteria for making decisions by prosumers to use the technology for power balancing in households*

11.00-11.20 Paweł Kossecki and Magdalena Teclaw

*Application of Business Intelligence Tools for the Purposes of Comparability Analysis in Transfer Pricing*

11.20-11.40 Marek Kvet

*Uniformly Deployed Sets in Discrete Optimization: Theory and Applications*

11.40-12.00 Petr Veigend, Gabriela Nečasová and Václav Šátek

*Taylor series based numerical integration method for solution of nonlinear problems with division*

12.00-12.20 Patrik Voštinár and Michal Šrobár

*Development of games using eye tracking devices*

**Thursday, November 14<sup>th</sup>, 2024**

**Session B**

**Artificial Intelligence and Machine Learning**

10.00-12.00

*Chair: Valentino Vranić*

10.00-10.20 Adrian Vulpe-Grigorasi, Zvetelina Kren, Djordje Slijepčević, Roman Schmied and Vanessa Leung

*Attention performance classification based on eye tracking and machine learning*

10.20-10.40 Matej Ondov, Tomáš Kormaník and Jaroslav Porubán

*A personalized education chatbot for the novice programmers in action*

10.40-11.00 Patrik Müller and Bogdan Walek

*Comparison of basic recommendation methods for Czech news articles*

11.00-11.20 Bianka Modrovičová and Adam Dudáš

*Cubic Graph Property Dataset for Machine Learning Models*

11.20-11.40 Miroslav Melicherčík, Alžbeta Michalíková and Vladimír Siládi

*Level of Service classifications within the Smart City concept using Artificial Intelligence tools*

11.40-12.00 Linda Blahova, Monika Svecova, Katarina Dubayova and Jozef Kostolny

*Analysis of Experimental Dataset for Potential Application in Non-Invasive Cancer Diagnosis*



**Thursday, November 14<sup>th</sup>, 2024**

**Satellite event – Workshop on Environmental Data Analysis**

08.15-12.20

*General Chair: Michal Kvet*

08.20-08.40 Robert Leskovar, Alenka Brezavšček and Alenka Baggia  
*Transforming and Analysing Oceanographic Data with Oracle Analytics Cloud: Insights from the World Ocean Database*

08.40-09.00 Filip Majerik and Monika Borkovcova  
*Verify the Effectiveness of the Intelligent Data Layer on Different Hardware Configurations*

09.00-09.20 Marek Kvet, Michal Kvet, Zuzana Žillová and Erik Malina  
*Information System for Crime Monitoring in Europe*

09.20-09.40 Michal Kvet  
*Comparative Study of Various Function Definitions Used in Oracle SQL Dialect*

09.40-10.00 Ivan Pastierik  
*Deploying Oracle Machine Learning AutoML Models for Oracle APEX Analytics*

10.00-10.20 Miroslav Potočár and Michal Kvet  
*Data-driven decision-making options for less tech-savvy users*

10.20-10.40 Tomáš Brandejský and Jan Merta  
*Versatile Function GPA*

10.40-11.00 Jan Merta and Tomáš Brandejský  
*Use of two-layer genetic programming for multidimensional symbolic regression*



11.00-11.20 Alenka Baggia, Alenka Brezavšček and Robert Leskovar  
*Enhancing Environmental Data Insights with Oracle Analytics Cloud*

11.20-11.40 Diana Mudrinić and Ivan Šoda  
*The Rise of Generative Artificial Intelligence in Business*

11.40-12.00 Filip Majerik and Monika Borkovcova  
*Performance Testing of Intelligent Data Layer*

12.00-12.20 Ondřej Rozinek  
*A Similarity Space Approach to the 1/3-2/3 Conjecture in Partially Ordered Sets*



**Friday, November 15<sup>th</sup>, 2024**

**Regular sessions**

09.00-10.40

**Conference closing**

10.45

**Lunch**

11.00



**Friday, November 15<sup>th</sup>, 2024**

**Session A: Software Engineering**

09.00-10.40

*Chair: Miroslaw Kurkowsk*

09.00-09.20 Piotr Plebański, Anna Kelm and Robert Kłopotek  
*Mitigating Execution Divergence in GPGPU Computing through Dynamic Data Remapping*

09.20-09.40 Jarmila Škrinárová and Adrián Hamada  
*Modeling Effective IoT Task Scheduling in a Simulated Edge and Fog Cloud Environment*

09.40-10.00 Peter Sedlacek and Patrik Rusnak  
*Architecture Design of Software Solution for Reliability Analysis*

10.00-10.20 Marek Horváth, Vladyslav Sakhnenko and Filip Gurbál  
*Comparison of scalability and performance in Microservices and Monolithic Architectures*

10.20-10.40 Blaženka Divjak, Barbi Svetec, Petra Vondra and Darko Grabar  
*Automating the Comparison of Learning Design and Delivery Using Course Scaffolding in Moodle*

**Friday, November 15<sup>th</sup>, 2024**

**Session B: Applied Informatics**

09.00-10.40

*Chair: Caterina Urban*

09.00-09.20 Krzysztof Szmigielski, Mirosław Kurkowski and Bogusław Gozdecki

*Timed properties of cryptographic security protocols – simulation approach*

09.20-09.40 Artur Soboń, Mirosław Kurkowski and Sylwia Stachowiak

*ChaCha20 Cipher Cryptanalysis through SAT Problem Solving*

09.40-10.00 Branislav Sobota, Štefan Korečko and Alexandra Javorská

*Iconic-Text Education Method Utilization in a Virtual School*

10.00-10.20 Štefan Korečko, Branislav Sobota, Peter Nehila, Damián Chmura

*Architecture, Enhancements and Perspective of the L-NeRVEn Virtual Environment for Neurorehabilitation*

10.20-10.40 Branislav Sobota, Štefan Korečko and Richard Grec  
*XR Technologies-Based Experimental Therapy System for Visual Enhancement of Patient's Brain Associations*

**Friday, November 15<sup>th</sup>, 2024**

**Session C: Artificial Intelligence and Machine Learning**

09.00-10.40

*Chair: Alžbeta Michalíková*

09.00-09.20 Lenka Bubeňková, Emília Pietriková and Marcel Vološin  
*Clone Detection Techniques and Tools in Software Engineering*

09.20-09.40 Kalina Juszczak-Janiszewska, Rafal Zapłata and  
Mirosław Kurkowski  
*Airborne laser scanning data and deep learning in the detection of archaeological features*

09.40-10.00 Anna Kelm, Piotr Plebański and Robert Kłopotek  
*Impact of Deep Learning-Based Text Feature Extraction Methods on Binary Classification Quality of Customer Service Call Transcripts*

10.00-10.20 Adam Dudáš and Michal Vagač  
*Diagnostic Analysis Approach to Correlation Maps Through Large Language Models*

10.20-10.40 Jannatim Maisha, Muhammad Azmain Mahtab, Farhana Hossain Swarnali, Tamanna Tabassum and Md. Tanvir Rouf Shawon  
*Safeguarding Music Artists Through Machine Learning Based Singer Classification*



*Notes:*