2025 IEEE 23rd World Symposium on Applied Machine **Intelligence and Informatics** (SAMI 2025)

Stara Lesna, Slovakia 23-25 January 2025



IEEE Catalog Number: CFP2508E-POD ISBN:

979-8-3503-7937-2

Copyright © 2025 by the Institute of Electrical and Electronics Engineers, Inc. All Rights Reserved

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

*** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.

 IEEE Catalog Number:
 CFP2508E-POD

 ISBN (Print-On-Demand):
 979-8-3503-7937-2

 ISBN (Online):
 979-8-3503-7936-5

ISSN: 2836-0834

Additional Copies of This Publication Are Available From:

Curran Associates, Inc 57 Morehouse Lane Red Hook, NY 12571 USA Phone: (845) 758-0400

Fax: (845) 758-2633

E-mail: curran@proceedings.com Web: www.proceedings.com



Table of Contents

/elcome	3
ommitees	5
riving the Future of Connected Autonomous Mobility with Advanced Al nd Multi-Modal Data Fusion	. 11
hallenges in Medical Device Research and Development - 20 Years of Work nd Cooperation in BioTechLab	. 13
xplaining Internal Representations in Deep Networks: Adversarial Vulnerability f Image Classifiers and Learning Sequential Tasks with Sparse Reward Igor Farkaš	. 15
rocess Injection and Migration Techniques	. 17
eature Selection Methods for Intrusion Detection Systems in IoT	. 23
omparison of Performance on MRT, MCT, PSVT and HSVT Spatial Ability Tests etween Paper and Desktop Display	. 29
Review of Multi-Objective and Multi-Task Federated Learning Approaches	. 35
enchmarking Cryptographic Protocols for (IoT) Malware Defence	. 41
lachine Learning in Learning Analytics Dashboards: A Systematic Literature Review	. 47
he Development History of Technical Teacher Training from 1950 to the Change of Regime	. 53
nteractive Proof Assistant Based on Floyd-Hoare Logic Samuel Novotný, William Steingartner, Katarína Sivá, Ján Perháč	. 59
Comparative Study of Intrusion Events in Different SIEM Systems	. 65
upporting the Pedagogical Assessment Process in Educational Institutions with ocial Background Data Analysis and WTCAi System Integration	. 71
esign of a Cost-efficient Uniaxial Solar Tracking	. 77

Modernization in the Importing Procedure of the Automotive Industry
Team Confidence and Trust during Group Tasks according to a Primary Research
The Environmental Impact of Tourism Actors from an Individual Perspective
How Generation Z Economics Students Think about Sustainability and the Environment
From the Rise of AI to Future Shock - State of the Art
Comparison of Manual and Al-assisted Labeling Techniques in Pixel-wise Instance Segmentation 115 Sándor Tarsoly, Péter Galambos, Artúr I. Károly
Using Convolutional and Capsule Neural Networks for Coeliac Disease Diagnosis
SetDQN: An Agent Number Invariant Reinforcement Learning Model using Set Transformers 129 Gabor Paczolay, Istvan Harmati
Optimizing Rail Traffic with Reinforcement Learning and Graph Attention Networks
TinyML for Computation-aware Transformer-based Anomaly Detection in Internal Combustion Systems
Solution of High-level Classification Task by Lowlevel Classifier in Vehicle Recognition Problem 147 Dávid Papp, Gábor Szűcs
Digital Parenthood: Manipulated Reality - the Impact of Social Media Algorithms on Young People's Worldview
Statistical Analysis-based Feature Selection for Anomaly Detection in AlS Dataset
Cloud-based cybersecurity and data management system for near Real-Time Monitoring and Alerting in Vehicle-SOC - a proof of concept
BiLSTM and BERT-Base-Multilingual-Cased Integration for Cyberbullying Detection: A Multi-Class Approach
Consumption of Technical Threat Intel Indicators
Simulation and Detection Methods of Specific 5G Attacks
The Role of Honeypots in Modern Cybersecurity Strategies
ETL Model for Pandemic Data Processing

Procedural Content Generator of a Polygonal Surface Models of Trees
Public Roads Management and Visualisation
Development of a MATLAB Application for Simulating the SEIQRD Pandemic Spread Model
Anomaly Detection in Blockchain Network using Unsupervised Learning
Simplifying Education of Reactive Programming Concepts Using Comparative Application
Procedural Content Generator for Generating a 3D Graphical Representation of the River Model
Updatable Corpus of Compiled Java Projects with Dependencies
A Preliminary Study on the Adoption of Self-service Technologies of Hungarian Cinemagoers 243 Judit Szűcs, Krisztián Németh, Tibor Guzsvinecz
QUBO Formulation of the Shortest Path Algorithm and its Evaluation on a Quantum Annealer
Testing of Asymmetric Cryptographic Authentication Protocols for Vehicle Communication
Valued Neighborhood Search for Determination of Pareto-Optimal Solutions
Data Analysis - Aggregate Function Performance
JSON Processing and Error Correction in SQL Functions
Improving Cybersecurity in Hospital Information Systems through Anonymization Techniques
How BBR Improves the Quality of Live TV Streaming Experience
Glance at Quantum Innovations in Crop Pest and Disease Detection: Bridging Physics and Agriculture
The 3D Visualization of Digitalized Pathological Serial Sections on a Native Resolution
Control-Oriented Model for Energy-Efficient Electric Vehicle
OUbot: The Design and Development of an Underwater Vehicle
Advancements and Future Directions in Retinal Image Analysis Using Deep Learning

Machine Learning Techniques for Data Validation in Wide Area Measurement Systems
Microgrids Energy Demand Optimization: Towards Solar Sustainability in Lebanon and the Region 321 Haytham M. Dbouk, Layal Attieh
Deep Learning Methods for Multilingual Classification of Business Documents
Exploring GPT-Generated Variations in C Programming Assignments
Concept Drift Influenced by Topic Change in Data Streams from Social Media
Notes on the Performance Evaluation of Adversarial Examples
Use of Modern, Diagnostic and Treatment Modalities in the Treatment of Malignant Dieseases of the Breast with the Application of Compensators in Radiotherapy
The Use of CBCT Imaging in the Irradiation of Prostate Cancer
Enhancing NetVLAD based localization with Gaussian Splat
Visual Detection and Identification of UAVs by YOLO Networks
Modular Path-Following Control Architecture for Unmanned Ground Vehicles in ROS 2 Environment 371 Ádám Szabó, Dániel Károly Doba, Árpád Fehér and Szilárd Aradi
Comparison of Track Management Strategies in Automotive Track-to-Track Fusion Algorithms
Automated Landing of a Drone on a Moving Vehicle Using Computer Vision
Training T5 Models for Grammatical Error Detection in Slovak: Impact of Dataset Size
The Predictive Model for an Intelligent Maintenance System
Code Reuse and Good Clones in Programming Education
Effects of Online Learning Environments to the Academic Performance of Students
Modeling Remaining Service Life and Structural Health Monitoring of Roads with Machine Learning and Deep Learning
Dynamic Mode Decomposition Approach for Binary Motor Imagery EEG Signal Classification
EEG-Based Mental States Prediction of Driver. 429 Amit Kumar Dwivedi. Om Prakash Verma. Sachin Taran

Anca-Adriana Petcuț-Lasc, Valentina-Emilia Bălaș, Flavius-Maxim Petcuț, Raul Rotar, Daniel Alexuță
Harnessing IIoT and Industry 4.0 Paradigms for Advanced Energy Consumption Forecasting Using Ensemble Learning Techniques
Model of Research for Engineering Related Investigations
Integration of Human Localization into Augmented Reality Applications
Cybersecurity Challenges in the Power Sector: Analysing Attacks on Electrical Grids and Substations
Al Adoption in Finnish SMEs: Key Findings from Al Consultancy at a European Digital Innovation Hub
Al Implementation Capability Assessment and Development Planning: Towards a Tool for SMEs 47 Dmitry Kudryavtsev, Teemu Moilanen, Elisa Laatikainen, Umair Ali Khan
Environmentally Conscious Consumer Behavior in Generation Z - Trends and Motivations
Comparison of Different Machine Learning Algorithms for Stock Price Prediction
Path Overlap Detection and Property Graph Construction from TCX Data for Advanced Analysis
Synergies between Fuzzy Signatures and Hypergraphs
Cost-effectiveness Analysis of Optimized Chemotherapy Treatments
Noise Reduction and Precision Enhancement: Data Smooting Techniques for Dye-Sensitized Solar Cell Measurement Data
Enhancing Sensorless Start-Up in PMSM: Analysis and Optimization of Open-Loop Technique for Smooth Transitions
Analyzing EV Users' Charging Patterns for Estimating Session Parameters and Optimizing Load Management
Advancing Scientific Text Classification: Fine-Tuned Models with Dataset Expansion and Hard-Voting 52 Zhyar Rzgar K Rostam, Gábor Kertész
A Parameter Selection Strategy for the Generalized Fuzzy-Possibilistic c-means Algorithm 53: Mirtill-Boglárka Naghi, Levente Kovács, László Szilágyi,
Information Technology Solutions in the Romanian Tree Inventory Research: A Review
Authors' Index