

2024 IEEE 3rd Conference on Information Technology and Data Science (CITDS 2024)

**Debrecen, Hungary
26-28 August 2024**



**IEEE Catalog Number: CFP24BS6-POD
ISBN: 979-8-3503-8789-6**

**Copyright © 2024 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:	CFP24BS6-POD
ISBN (Print-On-Demand):	979-8-3503-8789-6
ISBN (Online):	979-8-3503-8788-9

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

CURRAN ASSOCIATES INC.
proceedings
.com

Table of Contents

Preface	iii
Committees	v
Modelling and visualization of spatial data: A case study of COVID-19 data in Maine, USA.....	1
<i>Ismail H. Abdi</i>	
Availability modeling in Software Architecture	6
<i>Tamas Bartok, Ferenc Hejja and Gergely Kocsis</i>	
On properties of feasibility in non-standard Heyting arithmetic	12
<i>Péter Battyányi</i>	
A Framework and a Theoretical Model to Integrate Internet-of-Things with Human Behavior in Teams	14
<i>Alex Doboli</i>	
Further Keyword Generation Experiment in Hungarian with Fine-tuning PULI Llumix 32K Model ..	20
<i>Réka Dodé and Zijian Győző Yang</i>	
Analysis of different Indoor Environment for the Terahertz propagation	25
<i>Nagma Elburki and Affes Sofiene</i>	
Transforming Erlang Server Applications	30
<i>Zsófia Erdei, István Bozó and Melinda Tóth</i>	
Impact of Random Number Generation Methods Usage on Swarm Intelligence Algorithms for Energy Optimization in Wireless Sensor Networks	36
<i>Levente Filep and Zoltan Gal</i>	
Application of digital twins for connected, cooperative and automated mobility	44
<i>Alexandru Forrai, Amit Gali and Ion Barosan</i>	
Model-based neural networks for thermographic image reconstruction	51
<i>Gergő Galiger, Nazila Azadi, Bernhard Lehner, Mario Huemer and Péter Kovács</i>	
Applying Hybrid Forecasting Model SARIMA-SVR for Daily Energy Consumption Data	57
<i>Herry Kartika Gandhi</i>	
Application of different option numbers in Thurstone motivated models	63
<i>László Gyarmati, Csaba Mihálykó and Éva Orbán-Mihálykó</i>	
A stacked ensemble model to identify Bangla religious hate comments	69
<i>Md. Nahid Hasan, Raiyan Azim, Mahmudul Hasan and Md. Monarul Islam</i>	
Training Embedding Models for Hungarian.....	75
<i>Péter Hatvani and Zijian Győző Yang</i>	
A comparative study of pre-trained models in breast ultrasound image segmentation	81
<i>Dhafer G. Honi, Mohammed Nsaif, Laszlo Szathmary and Szilvia Szeghalmy</i>	

Machine Learning Classification Approach for Refractive Index Prediction of D-Shape Plasmonic Biosensor	87
<i>Nazrul Islam, Md. Nahid Hasan, Mia Mohammad Shoaib Hasan, Imam Hossain Shibly, Mohammad Abu Yousuf and Md. Zia Uddin</i>	
Yule-Walker estimation of periodic INAR signals	93
<i>Márton Ispány</i>	
Decidability, Interpolation, Amalgamation - A Case Study from Algebra through Logic to Computer Science	101
<i>Sándor Jenei</i>	
Next Generation of Assessment Evaluation System for IT Configuration Challenges	102
<i>Tamás Kádek and Piroska Biró</i>	
Prediction Uncertainty and Node Usefulness in Shallow Unattributed Graph Neural Networks for Explainability	107
<i>Richárd Kiss and Gábor Szűcs</i>	
Forecasting Roll Rate for Sensor Plausibility Check in Off-Road Vehicle Conditions	113
<i>János Kontos, László Bódis and Ágnes Vathy-Fogarassy</i>	
Non-cooperative Polymorphic P systems	119
<i>Anna Kuczik</i>	
Requirement Specification of an Information Bank	121
<i>Gábor Kusper, Gyula Erdei and Attila Szekeres</i>	
Designing prompts and creating cleaned scientific text for Retrieval Augmented Generation for more precise responses from generative large language models	123
<i>Róbert Lakatos, Eszter Klára Urbán, Zoltán János Szabó, János Pozsga, Eszter Csernai and András Hajdu</i>	
Improving Machine Translation Capabilities by Fine-Tuning Large Language Models and Prompt Engineering with Domain-Specific Data	129
<i>László János Laki and Zijian Győző Yang</i>	
Machine Learning-Based Fine-Tuning for Accented Speech Recognition in Trinidad and Tobago	134
<i>Shaquille Jared De Lancy and Koffka Khan</i>	
Consistency and inconsistency in the case of a stochastic paired comparison model	140
<i>Csaba Mihálykó, Éva Orbán-Mihálykó and László Gyarmati</i>	
SAWE: Signature-based Aggregated Window Embedding for Unsupervised Time Series Segment Clustering	146
<i>Marcell Németh and Gábor Szűcs</i>	
Evaluating RNN Models for Multi-Step Traffic Matrix Prediction	152
<i>Mohammed Nsaif, Gergely Kovásznai, Hasanein D. Rjeib, Ali Malik and Ruairí de Fréin</i>	
Investigating the influence of hyperparameters on the optimal time-series prediction ability of generative large language models	158
<i>Arpad Pandý, Róbert Lakatos, Péter Pollner, Eszter Csernai and András Hajdu</i>	

Design of the Simulation Analysis Tool for Wireless Sensor Network	164
<i>Peter Polgar, Levente Filep and Zoltan Gal</i>	
Smart RANSAC: A Robust Approach.....	170
<i>Vinayak Raju and Chetana Pujari</i>	
Valid Decoding in Gaussian Mixture Models	175
<i>Branislav Rudic, Markus Pichler-Scheder and Dmitry Efrosinin</i>	
Harnessing Large Language Models: Fine-tuned BERT for Detecting Charismatic Leadership Tactics in Natural Language.....	181
<i>Yasser Saeid, Felix Neubürger, Stefanie Krügl, Helena Hüster, Thomas Kopinski and Ralf Lanwehr</i>	
A ConvNeXt V2 Approach to Document Image Analysis: Enhancing High-Accuracy Classification .	187
<i>Md Saiful Islam Sajol, A S M Jahid Hasan, Md Shazid Islam and Md Saydur Rahman</i>	
Emotion recognition based on facial gestures and Convolutional Neural Networks.....	193
<i>Francisco Emiliano Sanchez-Callejas, Irving A. Cruz-Albarran and Luis A. Morales-Hernandez</i>	
ECG Data Classification With Privacy Preservation in the IoT Context	199
<i>Codruta Maria Serban, Gheorghe Sebestyen and Anca Hangan</i>	
Automatic Analysis of Thermal Images to Detect Hot Spot Regions.....	205
<i>Norbert Serban and Balazs Harangi</i>	
A speed detection method for BLDC motor.....	211
<i>Fehmi Sevilmiş, Ali Sait Özer and Hulusi Karaca</i>	
Predicting Engineering Students' Employability using Data Mining Classification Techniques	216
<i>Maria Elisa Linda Taeza-Cruz, Mohammed Muneerali, Badria Hamed Al Ruqishi and Bernard Guzman Cruz</i>	
Analysis of the B5G/6G Communication Power Entropy Patterns Based on Generative AI Methods ..	223
<i>Djamila Talbi and Zoltan Gal</i>	
Using Speech Data to Automatically Characterize Team Effectiveness to Optimize Power Distribution in Internet-of-Things Applications	229
<i>Gnaneswar Villuri and Alex Doboli</i>	
Towards machine learning based text categorization in the financial domain	235
<i>Frederic Voigt, Jose Alcaez Calero, Keshav Dahal, Qi Wang, Kai von Luck and Peer Stelldinger</i>	
Winner prediction model for basketball matches based on statistical data of teams, players, and line-ups.....	241
<i>Chanin Witheesawas and Suphakant Phimoltares</i>	
The First Instruct-Following Large Language Models for Hungarian	247
<i>Zijian Győző Yang, Réka Dodé, Gergő Ferenczi, Péter Hatvani, Enikő Héja, Gábor Madarász, Noémi Ligeti-Nagy, Bence Sárossy, Zsófia Szaniszló, Tamás Váradi, Tamás Verebélyi and Gábor Prószéky</i>	
Purpose of mobility data usage and risk assessment: POSMO ethical data market case	253
<i>Olena Yatsenko</i>	
Author Index	259