

2021 IEEE 19th World Symposium on Applied Machine Intelligence and Informatics (SAMI 2021)

**Herl'any, Slovakia
21 – 23 January 2021**



**IEEE Catalog Number: CFP2108E-POD
ISBN: 978-1-7281-8054-0**

**Copyright © 2021 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:	CFP2108E-POD
ISBN (Print-On-Demand):	978-1-7281-8054-0
ISBN (Online):	978-1-7281-8053-3

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

Welcome	3
Commitees	4
Additive Manufacturing in Medicine and Tissue Engineering	11
<i>Radovan Hudak, Marek Schnitzer, Jozef Zivcak</i>	
Using Digital Technologies in the Measurement of Health Outcomes	13
<i>Zs. Zrubka, M. Péntek</i>	
Petri net implementation in programmable logic controllers: methodology for development and validation	15
<i>Igor Azkarate Fernández, Juan Carlos Mugarza Cortabarría and Luka Eciolaza Echeverría</i>	
A Real Time Artificial Intelligent System for Tennis Swing Classification	21
<i>Kevin Ma</i>	
The online learning from the students' perspective	27
<i>Judit Módné Takács, Monika Pogatsnik</i>	
Measurement of Water Consumption based on Image Processing	33
<i>Ondrej Kainz, Matus Dujava, Rastislav Petija, Miroslav Michalko, Frantisek Jakab</i>	
Curiosity-Driven Reinforced Learning of Undesired Actions in Autonomous Intelligent Agents	39
<i>Christopher Rosser and Khalid Abed</i>	
A Validation Approach for Deep Reinforcement Learning of a Robotic Arm in a 3D Simulated Environment	43
<i>Monica Gruosso, Nicola Capece, Ugo Erra, Flavio Biancospino</i>	
Two-Stage Sequence Model for Maximum Throughput in Cluster Tools	49
<i>Taehee Jeong, Kunj Parikh, Raymond Chau, Chung Ho Huang, Henry Chan, Hyeran Jeon</i>	
Testing of SLAM methods in the Matlab environment	55
<i>Michal Mihálik, Marián Hruboš, Aleš Janota</i>	
AR video presentation using 3D LiDAR information for operator support in mobile robot teleoperation	59
<i>Kae Doki, Kenya Suzuki, Akihiro Torii, Suguru Mototani, Yuki Funabora, Shinji Doki</i>	
KALEM - a writing aid for patients with upper limb tremor	65
<i>Branko Štefanovič, Monika Michalíková, Lucia Bednarčíková, Teodor Tóth, Radovan Hudák, Jozef Živčák</i>	
Modelling and implementation of Single Line Diagram data in IEC 61850 environment	71
<i>Dănuț Adrian Poștovei, Constantin Bulac, Ion Triștiu, Balduino Camachi, Nicolae Anton</i>	
Clear-View: A dataset for missing data in Remote Sensing Images	77
<i>Abhijeet Bhattacharya, Tanmay Baweja</i>	
A Baseline Assessment Method of UAV Swarm Resilience Based on Complex Networks	83
<i>Qin Sun, Hongxu Li, Yingchao Zhang, Yuxian Xie, Chengyu Liu</i>	
Production, additive printing and mechanical testing of PLA/PHB material with different concentrations of TAC emollient	87
<i>Tomáš Balint, Alena Findrik Balogová, Radovan Hudák, Jozef Živčák, Marek Schnitzer, Jozef Feranc</i>	
Keyframes retrieval for robust long-term visual localization in changing conditions	93
<i>Youssef Bouaziz, Eric Royer, Guillaume Bresson, Michel Dhome</i>	
Transfer and Visualization of the Data in Intelligent Environment	101
<i>Jakub Palsa, Martin Havrilla</i>	
Semantic Reasoning from Model-Agnostic Explanations	105
<i>Timen Stepisnik Perdih, Nada Lavrac, Blaz Skrlj</i>	
Application of Reinforcement Learning to a Mining System	111
<i>Aline Xavier Fidencio, Tobias Glasmachers, Daniele Naro</i>	

Leveraging Phone Numbers for Spam detection in Online Social Networks	119
<i>Rohit Jere, Anant Pandey, Manvi Singh, Mandar Ganjapurkar</i>	
Lightweight Deep Learning Model for Detection of Copy-move Image Forgery with Post-processed Attacks	125
<i>Muhammad Naveed Abbas, Mohammad Samar Ansari, Mamoon Naveed Asghar, Nadia Kanwal, Terry O'Neill, Brian Lee</i>	
Overview Article: Bioreactors Designed for 3D Bioprinted Tissue and Process Parameters	131
<i>Norbert Ferencik, Radovan Hudak, Viktoria Rajtukova, Miroslav Kohan, Tomas Breskovic, Jozef Zivcak</i>	
Supervised Operational Change Point Detection using Ensemble Long-Short Term Memory in a Multicomponent Industrial System	135
<i>Ashit Gupta, Vishnu Swaroopji Masampally, Vishal Jadhav, Anirudh Deodhar, Venkataramana Runkana</i>	
Using Class Activation Maps on Deep Neural Networks to Localise Waste Classifications	143
<i>Andrea Abela, Thomas Gatt</i>	
Multi-Class Detection of Laparoscopic Instruments for the Intelligent Box-Trainer System Using Faster R-CNN Architecture	149
<i>Fatemeh Rashidi Fathabadi, Janos L. Grantner, Saad A Shebrain, Ikhlas Abdel-Qader</i>	
Extended gateway model for OPC UA/IoT device integration	155
<i>Peter Peniak, Emília Bubeníková, Alžbeta Kanáliková</i>	
Psychophysiological modelling of trust in technology: Comparative analysis of algorithm ensemble methods	161
<i>Ighoyota Ben. Ajenaghughrure, Sónia Cláudia Da Costa Sousa, David Iamas</i>	
Improved Word Representations Via Summed Target and Context Embeddings	169
<i>Nancy Fulda, Nathaniel Robinson</i>	
Influence of the Cell Temperature on the Performance of a Dye Sensitized Solar Cell	175
<i>Zoltán Varga, Ervin Rácz</i>	
Style-Specific Turkish Pop Music Composition with CNN and LSTM Network	181
<i>Senem Tanberk, Dilek Bilgin Tükel</i>	
The Virtual Classroom: A New Cyber Physical System	187
<i>J. I. Olszewska</i>	
Compiler Module of Abstract Machine Code for Formal Semantics Course	193
<i>William Steingartner</i>	
Implementation of CNN based COVID-19 classification model from CT images	201
<i>Atakan Kaya, Kubilay Ataş, Indrit Myderrizi</i>	
Text Classifications Learned from Language Model Hidden Layers	207
<i>Nathaniel Robinson, Zachary Brown, Timothy Sitze, Nancy Fulda</i>	
Multi-degree-of-freedom joint nonlinear motion control with considering the friction effect	211
<i>Jiashuai Yang, Guoyuan Zhang, Liewen Wang, Jie Wang, Hao Wang</i>	
A comparative study of conventional and CNN-based implementations of facial recognition on Raspberry-Pi	217
<i>Kota Nakajima, Vasily Moshnyaga, Koji Hashimoto</i>	
Interactive monitoring of Electronic Circuits with Embedded Microcontroller	223
<i>Gyorgy Gyorok</i>	
A Portable BVM-based Emergency Mechanical Ventilator	229
<i>Jozef Zivcak, Michal Kelemen, Ivan Virgala, Peter Marcinko, Peter Tuleja, Marek Sukop, Erik Prada, Martin Varga, Jan Ligus, Filip Filakovsky</i>	
Parsing via Regular Expressions	235
<i>David Magyar, Sandor Szenasi</i>	

Influence of Heat Treatment on Dental Prostheses Produced by Additive Technology	239
<i>Viktória Rajtúková, Ľuboš Chromý, Alena Findrik Balogová, Gabriela Ižaríková, Andrea Sinčák Konečná, Radovan Hudák</i>	
Deep convolutional neural network for detection of pathological speech	245
<i>Lukas Vavrek, Mate Hires, Dinesh Kumar, Peter Drotar</i>	
Clothoid-based Trajectory Following Approach for Self-driving vehicles.	251
<i>Ernő Horváth, Claudiu Radu Pozna</i>	
Fake news detection in Slovak language using deep learning techniques	255
<i>Kludia Ivancova, Martin Sarnovsky and Viera Maslej-Kresnakova</i>	
Towards Granular Knowledge Structures: Comparison of Different Approaches.	261
<i>Florian Stalder, Alexander Denzler, Luca Mazzola</i>	
Pilot study: Measurement of mechanical load using a glass-coated microwire for implantology applications	267
<i>Miroslav Kohan, Rastislav Varga, Radovan Hudák, Marek Schnitzer, Norbert Ferencík, Gabriela Dancáková, Samuel Lancoš</i>	
Slip Control by Identifying the Magnetic Field of the Elements of an Asynchronous Motor	273
<i>Jozef Novotňák, Milan Oravec, Ján Hijj, Daniel Jurč</i>	
Predicting Bank Return on Equity (ROE) using Neural Networks	279
<i>Tolgay Balci, Hasan Ogul</i>	
Efficient Neural Architecture Search for Long Short-Term Memory Networks.	287
<i>Hamdi Abed, Bálint Gyires-Tóth</i>	
Kinematics of Delta-type Parallel Robot Mechanisms via Screw Theory: A tutorial paper	293
<i>László Szucs, Péter Galambos, Dániel András Drexler</i>	
A Framework for Lecture Video Segmentation from Extracted Speech Content	299
<i>Dipesh Chand, Hasan Oğul</i>	
Tag recommendation model using feature learning via word embedding	305
<i>Maryam Khanian Najafabadi, Madhavan a/I Balan Nair, Azlinah Mohamed</i>	
Q-Networks with Dynamically Loaded Biases for Personalization	311
<i>Jan Magyar, Peter Sincak</i>	
Incremental Parameter Estimation of Stochastic State-Based Models	317
<i>Robert Lipp, Guido Dartmann, Lejla Fazlic, Thomas Vollmer, Stefan Winter, Arne Peine, Lukas Martin, Anke Schmeink</i>	
External Auditors' Assessments of Cyber-Security Risks	323
<i>Tran Nguen Bao Ngo, Andrea Tick</i>	
Predictive Analytics for Default of Credit Card Clients	329
<i>Alžbeta Bačová, František Babič</i>	
Measuring the morpho-syntactic ambiguity using the edit distance functions.	335
<i>Peter Bednár</i>	
Investigation of Novel Thrust Parameters to Variable Geometry Turbojet Engines	339
<i>Karoly Beneda</i>	
Representation of Dense Volume Datasets Using Pointerless Sparse Voxel Octrees With Variable and Fixed-Length Encoding	343
<i>Branislav Madoš, Norbert Ádám, Martin Štancel</i>	
Algorithms of Machine Learning in Recognition of Trolls in Online Space	349
<i>Kristína Machová, Michal Porezaný, Miroslava Hreškova</i>	
Diversity in Ensemble Model for Classification of Data Streams with Concept Drift	355
<i>Michal Kolarik, Martin Sarnovsky, Jan Paralic</i>	

Software Modernization Using Machine Learning Techniques	361
<i>Norbert Somogyi, Gabor Kovesdan</i>	
Towards the Understanding of Black Box Neural Classifier	367
<i>Ivan Cik, Andrindrasana David Rasamoelina, Marian Mach, Peter Sincak</i>	
Developing an Autonomous Valet Parking System in Simulated Environment.	373
<i>Gábor G. Varga, András Kondákor and Márton Antal</i>	
Explaining Deep Neural Network using Layer-wise Relevance Propagation and Integrated Gradients	381
<i>Ivan Cik, Andrindrasana David Rasamoelina, Marian Mach, Peter Sincak</i>	
Hybrid Object Detection Using Domain-specific Datasets.	387
<i>Martin Štancel, Branislav Madoš, Martin Chovanec, Peter Baláž</i>	
Improving the activity recognition using GMAF and transfer learning in post-stroke rehabilitation assessment	391
<i>Issam Boukhennoufa, Xiaojun Zhai, Klaus D. McDonald-Maier, Victor Utti, Jo Jackson</i>	
The Impact of Braille Systems on Advanced Mathematical Geometry	399
<i>Ogbolu Melvin Omone, Zsíros Tímea, Miklós Kozlovsky</i>	
Distance estimation using mono camera at different altitudes and pitch angles	405
<i>Nurgeldy Praliyev, Viktor Remeli, Zsolt Szalay</i>	
Gender domain adaptation for automatic speech recognition	413
<i>Artem Sokolov, Andrey V. Savchenko</i>	
Usage of RAPTOR for travel time minimizing journey planner	419
<i>Jaromir Sulc, Katerina Sulcova</i>	
Algorithm for on-line calendar text generation in public transport	425
<i>Jaromir Sulc, Katerina Sulcova</i>	
The Basic Application of Biostatistics to Biomedical Science Using R Programming	431
<i>Ogbolu Melvin Omone, Levente Kovács, Miklós Kozlovsky</i>	
A UAV Skydog as a Platform for a Research and a Development of Advanced Control Systems	437
<i>J. Leško, D. Megyesi, Š. Karaffa, M. Hlinková, R. Andoga and R. Bréda</i>	
Parameter identification of a tumor model using artificial neural networks	443
<i>Melania Puskas, Daniel Andras Drexler</i>	
Different triplet sampling techniques for lossless triplet loss on metric similarity learning	449
<i>Gabor Kertesz</i>	
Segmentation of Brain Tissues from Infant MRI Records Using Machine Learning Techniques	455
<i>Bela Suranyi, Levente Kovacs, Laszlo Szilagyi</i>	
Key-Value Pair Searching System via Tesseract OCR and Post Processing	461
<i>Áron Zoltán Kaló, Miklós László Sipos</i>	
AI supported Corporate Governance.	465
<i>Katalin Szenes, Bence Tureczki</i>	
Automatic Segmentation of Brain Tumor Parts from MRI Data Using a Random Forest Classifier	471
<i>Szabolcs Csaholczi, Levente Kovacs, Laszlo Szilagyi</i>	
Occlusion Handling in Generic Object Detection: A Review.	477
<i>Kaziwa Saleh, Sándor Szénási, Zoltán Vámosy</i>	
Speeding up the Reduced Gradient Method for Constrained Optimization.	485
<i>Hazem Issa, József K. Tar</i>	
Data engineering case-study in digitalized manufacturing	491
<i>István Pölöskei</i>	

Resilience Interpretations of Small and Medium-sized Enterprises and its Analytical Approaches – Literature Review495
Ferenc Tolner, Gyorgy Eigner and Balazs Barta

Model Centered Engineering in Wide Context501
László Horváth

Authors Index.507