## 2020 IEEE 14th International Symposium on Applied Computational Intelligence and Informatics (SACI 2020)

Timisoara, Romania 21 – 23 May 2020



**IEEE Catalog Number:** 

**ISBN:** 

CFP2045C-POD 978-1-7281-7378-8

## Copyright © 2020 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:
 CFP2045C-POD

 ISBN (Print-On-Demand):
 978-1-7281-7378-8

 ISBN (Online):
 978-1-7281-7377-1

## **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**

Welcome	3
Committees	4
Unsupervised learning based mining of academic data sets for students' performance analysis	11
Liana Maria Crivei, Gabriela Czibula, George Ciubotariu, Mariana Dindelegan Babes-Bolyai University, Cluj-Napoca, Romania	
Extending BigTim Distributed Clustering Platform to Support Mobile Devices	17
Using self-organizing maps as unsupervised learning models for meteorological data mining Andrei Mihai Babes-Bolyai University, Cluj-Napoca, Romania	23
Multi-Staged Training of Deep Neural Networks for Micro-Expression Recognition  Sergiu Cosmin Nistor  Babes-Bolyai University, Cluj-Napoca, Romania	29
ASTERICS: Projection-based Classification of EEG with Asymmetric Loss Linear Regression and Genetic Algorithm Krisztian Buza Eövös Loránd Unviersity (ELTE), Budapest, Hungary	35
Babes-Bolyai University, Cluj Napoca, Romania  Network-based clustering of book genres based on the connection between books bought together  Dalina Muntea, Madalina Giurgiu, Alexandru Topirceanu  Politehnica University Timisoara, Timisoara, Romania	41
Modelling of accidents for four lane non-urban highways using artificial neural networks technique	47
Frequency Domain Design of Controllers for Lighting Process  Alexandra-Bianca Borlea, Radu-Emil Precup, Ioan-Daniel Borlea, Alexandru Nicolae Dragus  Politehnica Univ. Timisoara, Timisoara, Romania	53
A Theory Approach Logic Model: Preventing Dehydration Symptoms Using Reduced Alcohol Intake (RAI) Logic Model Ogbolu Melvin Omone, Aniko Szarvak, Miklós Kozlovszky, Abdallah Benhamida Óbuda University, Budapest, Hungary	59
Control of maneuvering fixed wing UAVs	65
The Differences in Hydration and Dehydration Status: Physiological Characteristics in Students	71

Modeling of mixed data for Poisson prediction	77
Matej Petrous*, **, Evzenie Uglickich**	
*Czech Technical University, Prague, Czech Republic	
**Czech Academy of Sciences, Prague, Czech Republic	
Consideration about the stability and performance of a minimum variance control system	83
Ioan Filip, Iosif Szeidert, Octavian Prostean, Cristian Vasar	
Politehnica University of Timisoara, Timisoara, Romania	
The evolution and challenges of modern Distributed Control Systems	89
Dănuț Adrian Poștovei, Constantin Bulac, Ion Triștiu, Balduino Camachi	
University Politehnica of Bucharest, Bucharest, Romania	
Warning Solution for Medication Administration	95
Monica-Lavinia NEDELCEA, Adriana ALBU	
Politehnica University Timisoara, Timisoara, Romania	
A comparative study on using unsupervised learning based data analysis techniques for breast cancer detection	99
Stefan Nitica, Gabriela Czibula and Vlad-Ioan Tomescu	
Babes-Bolyai University, Romania	
Understanding the Impact of Mutable Global State on the Defect Proneness of Object-Oriented Systems	. 105
Cosmin Marsavina	
University Politehnica of Timisoara, Romania	
CV SimP: An approach for predicting proteins' structural similarity using one-shot learning	. 111
Mihai Teletin and Gabriela Czibula	
Babes-Bolyai University, Cluj-Napoca, Romania	
XNow: A deep learning technique for nowcasting based on radar products' values prediction	. 117
Ioana Angela Socaci, Gabriela Czibula, Vlad-Sebastian Ionescu and Andrei Mihai	
Babes-Bolyai University, Cluj-Napoca, Romania	
Efficient iris segmentation and pupil detection for visagisme applications	. 123
lleni Tudor-Alexandru	
Babes-Bolyai University, Cluj-Napoca, Romania	
FoRConvD: An approach for food recognition on mobile devices using convolutional neural networks and depth maps	. 129
Vlad-loan Tomescu	
Babes-Bolyai University, Cluj-Napoca, Romania	
Analysing protein dynamics using machine learning based generative models	. 135
Alexandra-loana Albu and Gabriela Czibula	
Babes-Bolyai University, Cluj-Napoca, Romania	
Towards Preschoolers' Automatic Satisfaction Assessment. An Experience Report	. 141
Adriana-Mihaela Guran, Grigoreta-Sofia Cojocar, Alexandra Turian	
Babes <sub>s</sub> -Bolyai University, Cluj-Napoca, Romania	
Traffic micro-simulation as a validation tool for developing genetic algorithms for green wave optimization	. 147
Alexandru Iovanovici, Dacian Avramoni, Anca-Maria Moscovici, Lucian Prodan	
Politehnica University Timisoara, Romania	
Machine learning methods in Smartphone-Based Activity Recognition	. 153
Istvan Pintye	
Institute for Computer Science and Control (SZTAKI), Hungary	
Óbuda University, Budapest, Hungary	

Investigation of the Fill Factors for a DSSC Solar Cell on the Basis of Module Temperature Using Different Artificial Irradiations	150
Ervin Rácz, Zoltán Varga	133
Ét vill Nacz, Zoltali Valga Óbuda University, Budapest, Hungary	
De de des Constantes CAPE Mar Constitute Marie and the Theorem	445
Deductive Synthesis of Min-Max-Sort Using Multisets in Theorema	165
West University, Timisoara, Romania	
Tudor Jebelean Johannes Kepler University, Linz, Austria	
Assisting Radiologists Through Automatic Cardiothoracic Ratio Calculation	173
Bogdan Bercean, Stefan Iarca, Andrei Tenescu, Cristian Avramescu, Sebastian Fuicu	
Politehnica University of Timisoara, Romania	
Evaluation of air quality variability in Timişoara, Romania	179
lasmina Gruicin, Marian-Emanuel Ionașcu and Mircea Popa	
University Politehnica of Timișoara, Romania	
Ensembling Routing Algorithms	183
ZhenHao Wu, Rafael Falcon, Voicu Groza and Emil Petriu	
University of Ottawa, Ottawa, Canada	
Dynamics of the Wind Power Plants at Small Wind Speeds	197
Emilia Dobrin, Mihaela-Codruta Ancuti, Sorin Musuroi, Ciprian Sorandaru, Razvan Ancuti, Meda Alexandra Lazar	10/
University Politehnica Timisoara, Romania	
Layered LDPC decoder in-order message access scheduling: a case study	193
Oana Boncalo, Alexandru Amaricai	
University Politehnica Timisoara, Timisoara, Romania	
The use of peak over threshold methods to characterise blood glucose curves	199
Mátyás Szigeti, Tamás Ferenci, Levente Kovács	
Óbuda University, Budapest, Hungary	
Wind Power Plants Operation at Variable Wind Speeds	205
Ciprian Carstea, Florin Butaru, Mihaela-Codruta Ancuti, Sorin Musuroi, Antheia Deacu, Mircea Babaita, Alin Marius Stanciu	203
University Politehnica Timisoara, Romania	
Models of Two-Wheeled Mobile Robots with Experimental Validation	211
Denis Komor, Raul-Cristian Roman, Radu-Emil Precup, Radu-Codrut David, Ion Pamfilii	
Politehnica Univ. Timisoara, Timisoara, Romania	
Mathematical Formalism of Sequential Automaton with Parallel Branches used in Industrial Automation	217
Dan Ungureanu-Anghel, Raul Robu, Octavian Prostean	
"Politehnica" University of Timisoara, Romania	
Tackling Actuator Saturation in Fixed Point Iteration-based Adaptive Control	221
Hazem Issa, József K. Tar	22 1
Óbuda University, Budapest, Hungary	
Investigation of the Efficiency of Conversion of Directed Cranks to 2 CAT Ducklanes	227
Investigation of the Efficiency of Conversion of Directed Graphs to 3-SAT Problems	22/
Gábor Kusper, Csaba Biró, Tamás Balla	
Eszterházy Károly University, Eger, Hungary	
A Workspace Mapping Software Tool for Generalized Triangle Parallel Robots	235
László Szűcs, Péter Galambos	
Óbuda University, Budapest, Hungary	

Examining the Efficiency of Magnetometers in Movement Classification Systems	241
Peter Sarcevic	
University of Szeged, Szeged, Hungary	
A Control Loop-based Algorithm for Operational Transformation	247
Cristian Gadea, Bogdan Ionescu, Dan Ionescu	
University of Ottawa, Ottawa, Ontario, Canada	
Self-driving vehicles: current status of development and technical challenges to overcome	255
Sergiu Coicheci, Ioan Filip	
Politehnica University of Timisoara, Timisoara, Romania	
Research Configuration of Engineering Modeling Platform	261
László Horváth	
Óbuda University, Budapest, Hungary	
Authors' Index	267