



SACI 2022

**IEEE 16th International Symposium
on Applied Computational Intelligence
and Informatics**

PROCEEDINGS



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May 15–28, 2022**

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IEEE Hungary Section

May 25 (Wednesday)

Also Zoom access: <https://us06web.zoom.us/j/84641424299>
(EEST time zone)

8:00 – 12:30 and 14:00 – 16:00 **Registration**

Room A107

9:00 – 9:20 **Opening Ceremony**

Room A101

9:20 – 10:00 **Plenary Talk I**
Session chair: **Imre J. Rudas**

Room A101

74	Robert Kozma	Large-Scale Networks: From Intelligent Robotics to Emergency Response
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10:00 – 10:40 **Plenary Talk II**
Session chair: **Ciprian-Bogdan Chirila**

Room A101

73	László T. Kóczy	Discrete Bacterial Memetic Evolutionary Algorithms for Solving High Complexity Problems
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10:40 – 11:00 Coffee break

11:00 – 11:40 **Plenary Talk III**
Session chair: **Radu-Emil Precup**

Room A101, via Zoom

75	Dan Selisteanu	Wastewater Treatment Plants – Classical vs. Advanced and Intelligent Control Approaches
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11:40 – 12:20 **Plenary Talk IV**
Session chair: **Imre Felde**

Room A101, via Zoom

76	Rafael Colás	Predicting the Behaviour of Advanced High-Strength Steels by Mathematical Modelling
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12:20 – 14:00 Lunch

CP1

14: 15 – 16:00 [W1] Session on Systems Engineering, Intelligent Mechatronics and Intelligent Robotics

Room A101

Session chair: **Mihaela Codruta Ancuti**

61	Peter Kadar	Test Measurements of Small Scale Household Microgrid Operation
41	Ciprian Sorandaru, Sorin Musuroi, Mihaela Codruta Ancuti, Geza Mihai Erdodi, Alin Marius Stanciu and Razvan Ancuti	Considerations Regarding The Perturb And Observe Method To Control High-Power Wind Systems Operating At Variable Wind Speeds
80	László Horváth	Context Mediated Communication (CMC) in Research Project
79	György Molnár	Trends in Digital Education in Higher Education Today - Methodological and Technological Experiments and Good Practices
39	Dorin Bordeasu, Octavian Proştean, Cristian Vaşar and Ali Debeş	Load comparison between two controlling strategies for wind energy conversion system power-boosting
60	Miruna Maria Damian and Radu Emil Precup	Signal Preprocessing and Artifact Removal for Brain-Computer Interfaces
8	Balint Varga, Christopher Doer, Gert Trommer and Sören Hohmann	Validation of a Limit Ellipsis Controller for Rescue Drones

16:00 – 16:15 Coffee break

16:15 – 17:15 [W2] Special Session on PhD Student Research in Applied Informatics and Numerical Mathematics

Room A101

Organizer and session chair: **László Horváth**

68	Istvan Pintye, József Kovács and Róbert Lovas	Evolutionary approach for neural network based agents applied on time series data in the Cloud
34	Claudiu Voica, George Belgiu, Ioan Calin Gozman-Pop, Robert Parmanche, Andrei Bosancu and Liviu Bereteu	Theoretical, Numerical and Experimental Investigations of Overhang Effect on a Cutting Tool Natural Frequencies
20	Mohammed Mudabbiruddin and László Pokorádi	Markovian Model of Ageing Processes – Core Model
63	Kerecsen Szabó, Gergő Pintér and Imre Felde	Evaluating the Socioeconomic Status of a Large Social Event Attendees

17:15 – 18:00 [W3] Special Session Safety and Security Sciences

Room A101

Organizer and session chair: **Zoltán Rajnai**

31	Esmeralda Kadena, Lourdes Ruiz and Zoltán Rajnai	Behavioral Biometrics for more (dis) trust and security
77	Silvana Qose and Beatrix Fregan	A Review of Cyber Security and Blockchain
23	Malak Shatnawi and Rajnai Zoltan	Digital Transformation during COVID-19 and Its Impact on Transportation and Mobility

18:30 Welcome Reception

CP2

May 26 (Thursday)

Also Zoom access: <https://us06web.zoom.us/j/84641424299>
(EEST time zone)

8:00 – 12:45	Registration	Room A107
8:30 – 10:30	[T1] Session on Computational Intelligence Session chair: Edit Tóth-Laufer	Room A 106

5	Marina-Adriana Mercioni and Stefan Holban	Weather Forecasting using AI
38	László Lindenmaier, Szilard Aradi, Tamás Bécsi and István Ferenc Lövétei	MILP-Based Optimization of the Extended Real-Time Railway Traffic Management Problem
72	Mircea Trifan, Bogdan Ionescu and Dan Ionescu	A Deep Learning Method for Sentence Embeddings Based on Hadamard Matrix Encodings
56	Ciprian Orhei and Radu Vasiiu	Image sharpening using dilated filters
57	Bálint Kővári, Bálint Pelenczei and Tamás Bécsi	Monte Carlo Tree Search to Compare Reward Functions for Reinforcement Learning
70	Edit Tóth-Laufer and Ildar Batyrshin	Similarity-based Personalized Risk Calculation
78	Satya Chandrashekhar Ayyalasomayajula, Bogdan Ionescu, Mircea Trifan and Dan Ionescu	A Multimodal Deep Learning Approach to Emotion Detection and Identification
66	Adrian Bublea and Cătălin Daniel Căleanu	AutoML and Network Architecture Search for Gaze Estimation

10:30 – 10:45 Coffee break

10:45 – 12:30	[T2] Session on Informatics Session chair: Alexandru Topirceanu	Room A 106
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53	Omar Mohamed and Ciprian-Bogdan Chirila	Towards malware detection based on performance counters using deep learning classification models
26	Sebastian Mihai Ardelean and Mihai Udrescu	Circuit level implementation of the Reduced Quantum Genetic Algorithm using Qiskit
71	Melánia Puskás, Borbála Gergics and Dániel András Drexler	Parameter estimation from realistic experiment scenario using artificial neural networks
28	Petrsoara Golimba and Loredana Stanciu	Android Application to Support Communication Between Romanian Normal and Deaf Peoples
58	Eduard Gumbinger and Marius Marcu	NoSQL Performance Analysis in Android Apps
25	Alexandru Topirceanu and Mihai Udrescu	On cost-effective strategies for opinion diffusion in complex networks
64	Sara Imene Boucetta and Zsolt Csaba Johanyák	Survey on Security Attacks in Software Defined VANETs

10:45 – 12:30

[TP] E-poster Session

Session chairs: **Mihaela Codruta Ancuti, Adriana Albu, Miklós Mezei and Tamás Nógrádi**

Faculty Council Room at Ground Floor

44	Mihaela Codruta Ancuti, Ciprian Sorandaru, Sorin Musuroi, Geza Mihai Erdodi, Alin Marius Stanciu and Razvan Ancuti	Power Estimation Algorithm for High-Power Wind Turbines with Time Variable Wind Speed
54	Alexandru Rat, Cristina Stangaciu and Mihai Micea	Energy Consumption Analysis for Raspberry Pi Based Smart Mirrors and Proposed Solutions
55	Adela Neamtu, Dorin Simoiu, Andreea Raluca Ursu and Liviu Bereteu	Analysis of the Relaxation Effect by Vibrations on Some Rheological Models of Tissues
37	Ioan-Calin Gozman-Pop, Sorin Razvan Constantin, Andrei Bosancu, Eduard Nicusor Oanta, Costel Berce and Liviu Bereteu	Modal and Experimental Analysis of Satellites used for Side–Airbag System
42	Madalina Sofia Pasca, Bogdan Caruntu and Adriana Albu	A method for determining the analytical solution for Bagley Torvik equations with fractional derivatives

12:40 – 14:00

Lunch

CP1

15:00

DHC Ceremony

Rectorate Building (address: Piața Victoriei 2)

18:30

Banquet

Restaurant Universitar (address: Aleea FC Ripensia no. 1)

May 27 (Friday)

Today's presentations are via Zoom only

Please, join us at <https://us06web.zoom.us/j/84641424299> (EEST time zone)

8:00 – 9:45

[F1] Session on Computational Intelligence

Session chair: Cătălin Daniel Căleanu

10	Shintaro Hashimoto, Haruhiko Higuchi and Naoki Ishihama	Research on sufficiency and plausibility for AI applied to real task
27	Ioan Lucan Orășan, Ciprian Seiculescu and Cătălin Daniel Căleanu	Benchmarking TensorFlow Lite Quantization Algorithms for Deep Neural Networks
29	Ioan Cristian Schuszter and Marius Cioca	Towards Efficient Prediction of Computing Resource Usage Using Deep Learning Techniques
33	Tamara Žuvela, Sara Lazarević, Sofija Djordjević, Marko Arsenović and Srdjan Sladojević	Cryptocurrency Price Prediction Using Machine Learning
35	Peter Bednar, Martin Sarnovsky and Juliana Ivancakova	Semantic automatization of the data-analytical processes
59	Bogdan Ilie Sighencea, Rareș Ion Stanciu and Cătălin Daniel Căleanu	Pedestrian Trajectory Prediction in Graph Representation using Convolutional Neural Networks
65	Peter Smatana, Tomas Sabol, Jan Hreno, Peter Bednar and Michaela Smatanova	New Ways of Exploring Connections Between Cultural Heritage Objects

9:50 – 11:05

[F2] Session on Intelligent Mechatronics

Session chair: Vlad Muresan

6	Delia Moga and Ioan Filip	Role of Artificial Intelligence Techniques in Active Safety using Image Processing for Autonomous Driving Vehicles
32	Roxana Motorga, Vlad Muresan, Mihail Abrudean, Iulia Clitan and Mihaela Unguresan	IMC control strategy for the 13C Isotope Separation Process using a fractional order controller
36	Cezara-Liliana Rat, Octavian Prostean, Ioan Filip and Catalin Ichim-Burlacu	Boost Converter Modeling and Control based on its role within a Microgrid
45	Cristina-Maria Stancioi, Vlad Muresan, Mihai Abrudean, Iulia Clitan, Mihaela-Ligia Unguresan and Olimpia Bunta	Image Segmentation based System for Computing the Shifting of a Tooth
62	Flavius-Catalin Paulescu and Radu-Emil Precup	Fuzzy Models for a Two-Wheeled Self-Balancing Robot

11:10 – 12:40

[F3] Session on Systems Engineering and Informatics

Session chair: Gheorghe-Daniel Andreescu

19	Gábor Lukács and Tamás Bartha	Conception of a formal model-based methodology to support railway engineers in the specification and verification of interlocking systems
30	Yuxian Xie, Chengyu Liu, Hongxu Li, Yuzhi Wang and Yingchao Zhang	Research on resilience process model of space-based communication network based on OPM
43	Gheorghe-Daniel Andreescu and Razvan Petcu	Sensorless Control of PMSM Based on Active Flux Observer and MRAS Stator Resistance Identification
11	Antonio Luputi, Marius Babescu and Horia Ciocarlie	Dependence Between Power from the Electric Generator and Variable Wind Speed
40	Jan Hreno, Gabriel Lukac and Michaela Smatanova	Parallel Data and Information Visualization
3	Daniyar Nurmukhamet and Andrea Tick	Implementing ERP through the Use of Mobile Technologies: A Case Study

12:40 - 14:00

Break

14:00 – 15:30

[F4] Special Session on PhD Student Research in Applied Informatics and Numerical Mathematics

Organizer and session chair: László Horváth

17	Awudu Atinga, Amensisa Wirtu and József K. Tar	Adaptive Receding Horizon Control For Nonlinear Systems Exemplified by Two Coupled van der Pol Oscillators
48	Ferenc Tolner, György Eigner and Balázs Barta	Economic Cohesion Perspectives of the EU member Regions: A Non-parametric Approach
69	Katalin Ferencz, József Domokos and Levente Kovács	A statistical approach to time series sensor data evaluation using Apache Spark modules
67	Janos Czere, Laszlo Gulacsi, Zsombor Zrubka and Marta Pentek	Quality assessment of clinical trials with artificial intelligence based chatbots in healthcare: points to consider in the protocol development for a systematic literature review

50	Zoltan Varga and Dr. Ervin Racz	A Numerical Model and a Code Development for Photogeneration Rate Calculation for a Dye Sensitized Solar Cell
24	Hazem Issa and József K. Tar	Comparison of Various Noise Filtering Techniques in Strongly Nonlinear Adaptive Control

Thank you for your participation!

See you next year again!