

**IEEE INTERNATIONAL CONFERENCE AUTOMATICS AND INFORMATICS'2022 (ICAI'22),**

**6 - 8 October 2022, VARNA (Technical University – Varna) (Hybrid)**

<http://icai-conf.org>

## **CONFERENCE PROGRAM**

**THE GIVEN TIME IS ACCORDING TO THE BULGARIAN TIME ZONE - SOFIA UTC+3 HOURS**

**Thursday, October 6<sup>th</sup>**

**Stream 1 (Auditory Hall 114M)**

**10.00 - 10.15 WELCOME AND OPENING CEREMONY**

**Stream 1 (Auditory Hall 114M)**

**10.15 - 10:50 PLENARY SESSION (PS)**

**Chairman: Kosta Boshnakov**

**Integration of Decision Making and Control Systems**

**Mincho Hadjiski**

Bulgarian Academy of Sciences

**10.50 - 11:00 DISCUSSION**

<p style="text-align: center;"><b>Stream 1 (In attendance)</b> <b>(Track A – Hall 109TB)</b></p>	<p style="text-align: center;"><b>Stream 2 (Online)</b> <b>(Track B)</b></p>	<p style="text-align: center;"><b>Stream 3 (Online)</b> <b>(Track C)</b></p>
<p><b>11:00 – 12:30 SESSION A1</b></p> <p><b>“ARTIFICIAL INTELLIGENCE 1”</b></p> <p><b>Chairman: Ivaylo Penev</b></p> <p><b>1. Novel Model for Hospitalization Tracking based on Smart Contracts and IoT, Hristo Valchanov and Veneta Aleksieva (1250)</b></p> <p><b>2. Resilient Architecture Framework for Robotic Systems, Anton Hristozov, Eric Matson, John Gallagher, Marcus Rogers and Eric Dietz (4264)</b></p> <p><b>3. Comparative study of two on-line learnable neural approximators of a robot inverse kinematics, Zhivko Zhekov (9195)</b></p> <p><b>4. A Methodology for Estimation of Software Architectural Complexity in Publish-Subscribe Systems, Anton Hristozov and Eric Matson (1483)</b></p>	<p><b>11:00 – 12:30 SESSION B1</b></p> <p><b>“ARTIFICIAL INTELLIGENCE 2”</b></p> <p><b>Chairman: Gancho Vachkov</b></p> <p><b>1. Intelligent Logistics at Harvest Time in Grain Production, Vassil Sgurev, Lyubka Doukovska and Stanislav Drangajov (157)</b></p> <p><b>2. Using ontologies to support development of adaptive learning content, Tatyana Ivanova (5030)</b></p> <p><b>3. Compositional Machine Learning Method for Computer Security Incidents Response Taxonomy Classification, Veneta Yosifova (8609)</b></p> <p><b>4. Digital Twin Software Overview with Text Mining Techniques, Georgi Kolev, Viktoria Lozeva and Elena Koleva (6459)</b></p>	<p><b>11:00 – 12:30 SESSION C1</b></p> <p><b>“COMPUTER SCIENCE 1”</b></p> <p><b>Chairman: Petko Ruskov</b></p> <p><b>1. A framework of blockchain/IPFS-based platform for smart crop production, Ivan Popchev, Doukovska Lyubka and Irina Radeva (5204)</b></p> <p><b>2. An Algorithm for Generating All Subsets in Lexicographic Order, Valentin Bakoev (7540)</b></p> <p><b>3. Auditing blockchain smart contracts, Ivan Popchev, Irina Radeva and Veneta Velichkova (9644)</b></p> <p><b>4. Study of Received Signal Strength Indicator values of Bluetooth Low Energy in Test Environment and Simulation, Aydan Haka, Yordan Yordanov, Veneta Aleksieva and Hristo Valchanov (1394)</b></p>
<p><b>12:30 – 14:00 LUNCH</b></p>		

<b>14:00 – 15:30      SESSION A2</b>  <b>“CONTROL SYSTEMS 1”</b>  <b>Chairman: Nikola Nikolov</b>	<b>14:00 – 15:30      SESSION B2</b>  <b>“ARTIFICIAL INTELLIGENCE BASED TECHNOLOGIES 1”</b>  <b>Chairman: Atanas Atanassov</b>	<b>14:00 – 15:30      SESSION C2</b>  <b>“COMPUTER SCIENCE 2”</b>  <b>Chairman: Veneta Aleksieva</b>
<p><b>1. State Controller with Improved Response Speed for Linear Discrete SISO Systems</b>, Nikola Nikolov, Mariela Alexandrova, Rano Gaziyeva and Shakhnoza Ubaydullayeva (5392)</p> <p><b>2. A model - free method based on Laguerre series expansion for dynamic measurement improvement</b>, Tsonyo Slavov, Miroslava Baraharska and Ivan Markovsky (270)</p> <p><b>3. Application of a modulus and symmetrical optimum tuning methods for a cascade control system of a 2-joint planar robot</b>, Zhivko Zhekov (5461)</p> <p><b>4. Combined local system for joint purification of drinking water from iron and arsenic with limitation of the harmful substances level in rinse water</b>, Gancho Ganchev and Nikola Nikolov (2164)</p>	<p><b>1. Bimodal System for Facial Emotion Recognition Based on Deep Learning Neural Networks</b>, Dimitar Pilev, Atanas Atanassov and Fani Tomova (7384)</p> <p><b>2. Intelligent Real-Time Face Mask and Temperature Recognition Using Deep Learning on Raspberry Pi</b>, Oliver Simonoski, Izabela Mitreska and Ile Dimitrievski (2665)</p> <p><b>3. Validation and evaluation of models in the study of characteristic descriptors based on patients’ gender</b>, Ginka Marinova and Maya Todorova (4525)</p> <p><b>4. An Overview of some popular devices and technologies designed for blind and visually impaired people</b>, Tihomir Stefanov, Silvia Varbanova and Milena Stefanova (3537)</p>	<p><b>1. An improved approach of using data storage services in ASP.NET Core</b>, Daniel Damyanov, Zlatko Varbanov and Silviya Varbanova (7930)</p> <p><b>2. Repository Platform for RESTful Web Services</b>, Alexander Nikolov and Dessislava Petrova-Antonova (1565)</p> <p><b>3. Internet of Things–based pregnancy tracking and monitoring service</b>, Rosen Ivanov, Stanimir Yordanov and Dinko Dinev (2293)</p> <p><b>4. AutoCAD application for selecting the required materials for manufacturing machines and equipment from sheet material</b>, Aleksandrina Bankova, Stefan Tenev and Ismail Mehmedov Mehmedov (4131)</p>
<b>15:30 – 16:00 COFFEE BREAK</b>		

<b>16:00 – 18:00      SESSION A3</b> <b>“COMPUTER TECHNOLOGIES 1”</b> <b>Chairman: Hristo Valchanov</b>	<b>16:00 – 18:00      SESSION B3</b> <b>“ARTIFICIAL INTELLIGENCE BASED TECHNOLOGIES 2”</b> <b>Chairman: Gancho Vachkov</b>	<b>16:00 – 18:00      SESSION C3</b> <b>“DATA PROCESSING 1”</b> <b>Chairman: Radoslav Yoshinov</b>
<p><b>1. Comparison of compiler efficiency with SSE and AVX instructions</b>, Maria Pashinska-Gadzheva (2663)</p> <p><b>2. Performance Study of MySQL and MongoDB for IoT Data Processing and Storage</b>, Tsvetelina Mladenova and Irena Valova (4011)</p> <p><b>3. Android Application Prototype to Study Text Reading Speed and Comprehension</b>, Tsvetozar Georgiev (1847)</p> <p><b>4. Bitcoin Price Prediction using Long Short Term Memory Neural Networks</b>, Soudeh Javadimasoudian, Nisha Gowda, Paras M. Kathuria and Talha Ali Khan (6292)</p> <p><b>5. Measuring the effectiveness of blockchain smart contracts</b>, Alexander Panayotov and Petko Ruskov (2794)</p>	<p><b>1. Recycling Rate in Europe: Econometric Modeling and dART Clustering Analysis</b>, Reni Pantcheva and George Mengov (6294)</p> <p><b>2. Bot Development for Intelligent Automation in ERP Systems</b>, Radoslav Hrishev and Stela Stoykova (9309)</p> <p><b>3. Personal Assistant Supporting Diagnosis of Livestock Poisoning</b>, Veneta Komsalova, Stanimir Stoyanov, Lyubka Doukovska, Ivan Stoyanov and Stoyan Cherecharov (6521)</p> <p><b>4. Automated Music Generation using Deep Learning</b>, Shikhar Bhardwaj, Shalmiya Mundeth Salim, Talha Ali Khan and Soudeh Javadi Masoudian (4655)</p> <p><b>5. Study of the characteristics, capabilities and efficiency of a system for intelligent management of the power supply of a resort complex</b>, Desislava Delcheva (9191)</p>	<p><b>1. Increasing the Accuracy of Pulsar’s Period Measurement by Chinese Remainder Theorem</b>, Vladimir Ivanov, Ivan Garvanov, Nikolay Ivanov, Magdalena Garvanova, Genka Torres and Nikola Petrov (9711)</p> <p><b>2. A Survey of Data Quality and Processing of Information in Innovative Smart Devices</b>, Daniel Denev and Tsvetoslav Tsankov (7129)</p> <p><b>3. Statistical analysis of data using LabVIEW</b>, Vladimira Gančovska and Ivanka Krasteva (6738)</p> <p><b>4. Converting color to grayscale image using LabVIEW</b>, Vladimira Gančovska and Ivanka Krasteva (9186)</p>
<b>18:30 COCKTAIL in the HYK gallery</b>		

**Friday, October 7<sup>th</sup>**

<b>Stream 1 (In attendance)</b> <b>(Track A– Hall 109TB)</b>	<b>Stream 2 (Online)</b> <b>(Track B)</b>	<b>Stream 3 (Online)</b> <b>(Track C)</b>
<p><b>10:30 – 12:00      SESSION A4</b></p> <p><b>“ARTIFICIAL INTELLIGENCE 3”</b></p> <p><b>Chairman: Ventsislav Nikolov</b></p>	<p><b>10:30 – 12:00      SESSION B4</b></p> <p><b>“CONTROL THEORY”</b></p> <p><b>Chairman: Alexandra Grancharova</b></p>	<p><b>10:30 – 12:00      SESSION C4</b></p> <p><b>“DATA PROCESSING 2”</b></p> <p><b>Chairman: Valeri Mladenov</b></p>
<p><b>1. Using Machine Learning Algorithms to Improve Education Process</b>, Vladimir Jotsov, Zuhra Abdiakhmetova, Nurassyl Kerimbayev, Aidana Berdaly and Laura Zhumakhan (4490)</p> <p><b>2. Using the innovative I-learning platform in the education system</b>, Nurassyl Kerimbayev, Gulnar Madyarova, Madina Bolyskhanova, Galina Tkach, Ivan Garvanov and Zhanat Umirzakova (4154)</p> <p><b>3. Evaluation of cost-sensitive machine learning methods for default credit prediction</b>, Yanka Aleksandrova and Mariya Armyanova (7040)</p> <p><b>4. State Of Charge Estimation in Lithium-Ion Batteries via Machine Learning</b>, Viktor Mashkov, Milena Karova and Ivaylo Penev (5349)</p>	<p><b>1. Distributed Model Predictive Control of Time-Delay Systems: Application to a Series of Chemical Reactors</b>, Alexandra Grancharova, Sorin Olaru and Ivana Valkova (9943)</p> <p><b>2. Adaptive Metaheuristic Moth-Flame Optimized Droop Control Method for DC Microgrids</b>, Elvin Yusubov and Lala Bekirova (6587)</p> <p><b>3. Industrial Bound Design and Application of Fuzzy Logic PID Controller for Liquid level in Carbonisation Column</b>, Snejana Yordanova, Milen Slavov, Georgi Prokopiev and Desislava Delicheva (5449)</p> <p><b>4. Robust Control of Electro-Hydraulic Servo System</b>, Stanimir Yordanov, Georgi Mihalev and Krasimir Ormandzhiev (4137)</p>	<p><b>1. Biosignal measurements for Neurophysiological tests aimed to determine new beverage responses</b>, Stilyan Georgiev, Stanimir Andonov, Georgi Tsenov and Valeri Mladenov (1647)</p> <p><b>2. Complete Experimental Set with a Period Meter</b>, Desislava Mihaylova, Svilen Stoyanov and Asparuh Atanasov (2277)</p> <p><b>3. Network Design for Gathering Data in Manufacturing Process</b>, Antoniy Petrov and Albena Taneva (6904)</p> <p><b>4. Process Inspection and Data Collection for Manufacturing</b>, Antoniy Petrov and Albena Taneva (2973)</p>
<p><b>12:00 – 13:30 LUNCH</b></p>		

<b>13:30 – 15:00      SESSION A5</b> <b>“SYGNAL PROCESSING”</b> <b>Chairman: Nikolay Kostov</b>	<b>13:30 – 15:00      SESSION B5</b> <b>“CONTROL SYSTEMS 2”</b> <b>Chairman: Nikola Shakev</b>	<b>13:30 – 15:00      SESSION C5</b> <b>“OPTIMIZATION”</b> <b>Chairman: Idilia Bachkova</b>
<p><b>1. List of Selected Number of Optimal Solutions of the Assignment Problem by Time Criterion</b>, Lasko Laskov and Marin Marinov (7510)</p> <p><b>2. SONG Adaptive Delta Modulation Processing of PPG Signals with Motion Artifacts</b>, Nikolay Kostov, Hristo Zhivomirov, Boris Nikolov and Stela Kostadinova (920)</p> <p><b>3. Quadcopter’s telemetry parameters and their recursive estimates</b>, Ivan Grigorov, Dian Dzhibarov and Nasko Atanasov (8861)</p> <p><b>4. Investigating the possibility of monitoring the drying in the upper soil layer by means of a drone in the Dobruja region</b>, Asparuh Atanasov, Radko Mihaylov and Gallina Mihova (1941)</p>	<p><b>1. Intelligent Robotic Process Automation for Small and Medium-sized Enterprises</b>, Radoslav Hrishev, Stela Stoykova and Nikola Shakev (2280)</p> <p><b>2. Overview of Industrial Communcation in Process Automation</b>, Nikola Petkov and Anton Naumov (1159)</p> <p><b>3. Use of Elements and Algorithms of Intelligent Support in the Automation of Technologies for Control and Quality Management of Bulk Materials</b>, Polvon Kalandarov, Shakhnoza Ubaydulayeva, Rano Gaziyeva, Nikola Nikolov and Mariela Aleksandrova (3182)</p> <p><b>4. IEC/EN 62264 multi-dimensional scheduling approach using ISO 22400 Key Performance Indicators</b>, Plamen Vasilev (5472)</p>	<p><b>1. Multi-Objective Optimisation of Urban Design Using a Genetic Algorithm</b>, Stoyan Boyukliyski, Dessislava Petrova-Antonova, Emil Hristov and Kristiyan Hristov (1312)</p> <p><b>2. An Efficiency of Third Party Genetic Algorithms Software Libraries in Mobile Distributed Computing for Financial Time Series Forecasting</b>, Gergana Mateeva, Dimitar Parvanov, Ioan Dimitrov, Iliyan Iliev and Todor Balabanov (1930)</p> <p><b>3. Metaheuristic Maximum Power Point Tracking for PV systems under Partial Shading Conditions</b>, Elvin Yusubov and Lala Bekirova (760)</p> <p><b>4. Finding the minimum number of disks of fixed radius needed to cover a set of points in the plane by MaxiMinMax approach</b>, Stefan Panov, Svetlana Panova and Atanas Garbev (8798)</p>
<p><b>15:00 – 15:30 COFFEE BREAK</b></p>		

<p><b>15:30 – 16:10      SESSION A6</b></p> <p><b>“ADVANCED ELECTRICAL DRIVE”</b></p> <p><b>Chairman: Nikolay Djarov</b></p>	<p><b>15:30 – 17:00      SESSION B6</b></p> <p><b>“CONTROL SYSTEMS 3”</b></p> <p><b>Chairman: Kosta Boshnakov</b></p>	<p><b>15:30 – 16:30      SESSION C6</b></p> <p><b>“COMPUTER TECHNOLOGIES 2”</b></p> <p><b>Chairman: Ivan Kurtev</b></p>
<p><b>1. Synchronous Reference Frame Theory Control for Current Harmonics Suppression in Ship Power System Using Shunt Active Power Filter</b>, Dimitar Tsvetanov, Nikolay Djarov, Zhivko Grozdev and Julia Djarova (8100)</p> <p><b>2. Comparative Analysis of Conventional Methods for Braking a Three-phase Induction Motor and Research on Efficient Combinations of Methods for Efficient Braking Process</b>, Plamen Bahov and Mariela Alexandrova (2210)</p>	<p><b>1. Towards Achieving Thermal Comfort through Physiologically Cloud based controlled HVAC System</b>, Isibor Kennedy Ihianle, Pedro Machado, Kayode Owa and David Ada Adama (745)</p> <p><b>2. Model for determining of optimal ultrasonic sensors measurement zone</b>, Hristo Kilifarev and Delyan Genkov (4554)</p> <p><b>3. Energy management system based on wireless sensor networks and power line communications</b>, Azhar-Husain Omar, Reza Malekian and Dijana Capeska Bogatinoska (1808)</p> <p><b>4. Design, Manufacture and Control of the Prosthetic Hand with 3D Printer</b>, Arbnor Pajaziti, Genta Rexha, Xhevahir Bajrami, Edvin Rustemi, Jozef Kola and Mehmet Zeqiraj (2547)</p>	<p><b>1. Possibilities for visual programming in robotics via node-red</b>, Atanas Garbev (7868)</p> <p><b>2. Video lectures management system</b>, Delyan Genkov, Tsvetan Raykov and Hristo Kilifarev (6152)</p> <p><b>3. Educational technology integrating the project and problem-based approach in technical disciplines for the formation of creativity and creative thinking in engineering students</b>, Maya Stoeva, Petko Stoev and Denis Chikurtev (6183)</p> <p><b>16:30 – 18:00      SESSION C7</b></p> <p><b>“APPLICATIONS”</b></p> <p><b>Chairman: Nencho Deliiski</b></p>

**1. An Approach for Computing the Average Moisture Content in Batches of Wood Materials Subjected to Thermal Treatment,** Mincho Hadjiski, Nencho Deliiski, Pavlin Vitchev and Dimitar Angelski (1539)

**2. Parallel Distributed Compensation for the Control of Processes in Anaerobic Organic Wastewater Treatment,** Desislava Stoitseva-Delicheva and Snejana Yordanova (1292)

**3. LoRa Application for Food Monitoring – LYUTENITSA,** Krassimir Kolbe, Rositsa Maksimova and Atanas Kostadinov (2039)

**4. Positioning intermodal terminals optimally along a railway line using the train differential equation of motion,** Stoyo Todorov, Vladimir Popov and Matey Iliev (8250)

**18:15 – 18:30 CLOSING CEREMONY - Stream 1 (Online)**