2023 IEEE International Conference on Industrial Technology

Tuesday, 4 April 2023

08:00-08:15	*Sago* **Opening**
08:15-09:15	*Sago* **Invited Speaker**
09:15-10:15	*Sago* **Panel 1**
10:15-10:45	*Level 3 Coffee Area* **Coffee break**
10:45-12:30	*Meyer* **Cybersecurity in Industrial Applications** **Utilising the capabilities of next-generation PLC controllers for ICSs protection from cyber threats** *Marko Slunjski, Damir Sumina* **An Intrusion Detection System Dataset for a Multi-Agent Cyber-Physical Conveyor System** *Gustavo Funchal, Farzana Zahid, Victória Melo, Matthew Kuo, Tiago Pedrosa, Roopak Sinha, Fernando De la Prieta, Paulo Leitao* **Informed Deep Learning for Anomaly Detection in Cyber-Physical Systems** *Victor Cobilean, Harindra Mavikumbure, Chathurika Wickramasinghe, Daniel Marino, Milos Manic* **A Deep Multi-Modal Cyber-Attack Detection in Industrial Control Systems** *Sepideh Bahadoripour, Hadis Karimipour, Ethan MacDonald* **Blockchain-based Electricity Market Agent-Based Modeling and Simulation** *Ameni Boumaiza* **Comparing Different Sequences of Pruning Algorithms for Hybrid Pruning** *Pragnesh Thaker* **Technology-enabled agriculture advancements** *Sachin Vishwakarma, Aartee Chimate, Dhananjay Salunke, Prasenjit Bhavathankar*
	Sunburst **Cloud Computing, Big Data and Software Engineering** **PlastOPol: A Collaborative Data-driven Solution for Marine Litter Detection and Monitoring** *Jincheng Liu, Di Wu, Christina Hellevik, Hao Wang* **ChatGPT and Generative AI Guidelines for Addressing Academic Integrity and Augmenting Pre-Existing Chatbots** *Daswin de Silva, Nishan Mills, Mona El-Ayoubi, Milos Manic, Damminda Alahakoon* **A Blockchain based Framework for Secure and Decentralized Energy Trading in a Community** *Saurabh Sachdeva, Latif Fatehaj, Stefan Tan, Joel James, Oluwaseyi Ajayi, Tarek Saadawi* **Building Manufacturing Deep Learning Models with Minimal and Imbalanced Training Data Using Domain Adaptation and Data Augmentation** *Adrian Shuai Li, Elisa Bertino, Rih-Teng Wu, Ting-Yan Wu* **Accelerated Geophysical Inversion for Airborne Transient Electromagnetic Data Using GPU** *Nengyi Fu* **Mining for Popular Trends from Big TED Talk Data** *Carson Leung* **Mining Big Healthcare Data to Predict Long COVID Cases** *Carson Leung*

Tuesday, 4 April 2023

	Sago **Workshop VISION 2030**
12:30-13:45	*Citron* **Lunch**
13:45-15:30	*Meyer* **Industrial Automation, Communication and Networking** **Reflection-based Prototyping Framework for OPC UA Servers for Companion Specifications** *Moritz Walker, Christian von Arnim, Michael Neubauer, Armin Lechler, Oliver Riedel, Alexander Verl* **Virtual Cable: Beam-Direction Converter for IoT Communications inside a Motor** *Daisuke Kobuchi, Keisuke Manabe, Yuta Fuchigami, Yoshiaki Narusue, Hiroyuki Morikawa* **Artificial Intelligence Data-Driven Petri nets Approach for Virtualizing Digital Twins** *Alexandre Oliveira Júnior, José Luis Calvo Rolle, Paulo Leitao* **Industry 4.0-compliant Digitalization of a Re-configurable and Flexible Laser Cutter Module within a Digital Factory** *Khedr Kanaan, Jeffrey Wermann, Martin Alejandro Bär, Armando Walter Colombo* **Development of Electrical Cabinet Prototypes Based on Technology of Laminated Conductors** *Josipa Stegi rMarija Odak, Igor Erceg, Damir Sumina, Elvedin Top Ö v‘* **Literature Survey on Manufacturing Shop Floor Performance Measurements: Frameworks, Models, and Categorizations** *Abdul Rehan Khan Mohammed, JIAYI ZHANG, Benjamin Silverstone, Bilal Ahmad*
	Sunburst **Power Systems and Smart Grids** **Local Energy Marketplace Agents-based Analysis** *Ameni Boumaiza* **Extended State Observer Based Distributed Composite Control Strategy for DC Microgrid** *Ruifang Zhang, Wensheng Luo, Sergio Vazquez, Ligang Wu, Leopoldo G Franquelo, Ping He* **Intelligent Control of An Islanded Hybrid Microgrid** *mohammad khenar malek kkeili, Emad Samadaei, Camille-Laurie Normandeau, Jean-Nicolas Paquin, Kamal Al-Haddad* **Modular Multilevel Converters for Fast Charging Stations of Electric Vehicles: An Overview** *Sandy Atanalian, Fadia Sebaaly, Rawad Zgheib, Kamal Al-Haddad* **Developing Energy Analytics for Small Commercial Buildings** *Robert Cox* **Convergence Analysis for Delay Dependent LFC Scheme for Power Systems Networks Over Open Communication Networks with Disturbances*** *Shafiqul Islam* **Adaptive Sliding Mode Control for Interconnected Power Systems Networks with Disturbances*** *Shafiqul Islam*
	Sago **Workshop VISION 2030**
15:30-16:00	*Level 3 Coffee Area* **Coffee break**

Tuesday, 4 April 2023

16:00-18:00	*Meyer* **Student & Young Professionals**
	Sunburst **Work in Progress** **Guaranteed Quantization Error Computation for Neural Network Model Compression** *Wesley Cooke, Zihao Mo, Weiming Xiang* **Output Impedance Specification of A Three-Phase Current-Source Inverter for Modular Photovoltaic Applications** *Qilin PENG, Giovanni Migliazza, Giampaolo Buticchi, Sandro Guenter, Nadia Tan, Jiajun Yang, Patrick Wheeler* **Cloud-based Learning for Robot Control** *Shane Harrigan, Sonya Coleman, Dermot Kerr, Justin Quinn, Leeanne Lindsay, Kyle Madden* **Observer-based Model Predictive Control with Continuous Control Set for Single-phase Rectifiers** *Ahmad Dehghanzadeh, Rui Bo, Kamal Al-Haddad* **Smart AR workstation configuration in industrial assembly lines** *Abhaya Dhathri ARIGE, Marius Preda, Titus Zaharia* **Expanding the Frequency Range of 2nd Order Sinewave Oscillators with Composite Amplifiers** *Antonio Coelho, Jose Salvado, Antonio Espirito-Santo* **Voltage Balancing and Energy Sorting of 17L- ZPUC-Based Modular Multilevel Converter** *Sandy Atanalian, Fadia Sebaaly, Rawad Zgheib, Kamal Al-Haddad* **Enhancing the IEC 61499 with an IEEE 1451 TIM Function Block Standard** *Reza Abrishambaf, Helbert da Rocha, David Emanuel Gomes, Antonio Espirito-Santo* **Vision Guided Drone Flight for Entering Confined Spaces for Inspection** *Sambit Bhattacharya, Catherine Spooner, Erik Wemlinger*
	Sago **Workshop VISION 2030**
18:00-19:00	*Courtyard* **Welcome reception**

Wednesday, 5 April 2023

08:00-08:45	*Sago* **Invited speaker**
08:45-10:15	*Meyer* **Industry Forum**
	Sunburst **Tutorial**
	Sago **Workshop VISION 2030**
10:15-10:45	*Level 3 Coffee Area* **Coffee break**

Wednesday, 5 April 2023

10:45-12:30	*Meyer* **Control Systems, Robotics and Mechatronics - I** **Effects of wind noise on hybrid active noise cancellation headphones** *Takeru Watanabe, Seiji Kanai, Takenori Atsumi* **A Data-Driven Hybrid Automaton Framework to Modeling Complex Dynamical Systems** *Yejiang Yang, Zihao Mo, Weiming Xiang* **Development of UAV Localization and Navigation Techniques for Warehouse Inventory Inspection** *Huei-Yung Lin, Yi-Hao Li* **Reinforcement learning of LQR control policy by a double inverted-pendulum biomechanical model** *Kamran Iqbal, Muhammad Haras* **KeyState: Improving Image-based Reinforcement Learning with Keypoint for Robot Control** *Ling-Chen Chen, Chi-Kai Ho, Chung-Ta King* **NTSM Based Finite-time Consensus Control for a Networked of Quadrotor Vehicles With Disturbances*** *Shafiqul Islam*
	Sunburst **Electrical Machines, Drives, Sensors and Actuators** **Analytical Modelling of a Hybrid Reluctance Motor Based on Magnetic Equivalent Circuit** *Xinyi Su, Xiaofeng Yang, Yunlang Xu* **Smart Highways Based Vehicle Speed Sensor With Piezoelectric Energy Harvesting: A Progress Report** *Luay taha, Keven Rall, Kara Bailen, Elizabeth Bender, Hussein Abdeltawab, Sohail Anwar* **Modelization and Identification of Feed Drive Axis in CNC Machine Tools Using Two-Mass Model and Particle Swarm Optimization** *Jing-Xiang Zhang, Syh-Shiuh Yeh* **Support Vector Machine Aided Diagnosis of Concurrent Multiple Faults in Induction Motor** *Kenichi Yatsugi, Esakimuthu Pandarakone Shrinathan, Yukio Mizuno, Hisahide Nakamura* **Development of Joint Actuators for Human-Friendly Manipulators with Low Inertia and Easy Assembly** *Kazuma Morikawa, Seiichiro Katsura* **Enhanced Power-Sharing Control Algorithm for Dual-Inverter-Fed Open-End-Winding Induction Motor in Hybrid Electric Vehicles** *Khaled Safsouf, Jean Sawma, Hadi Kanaan, Haitham Abu-Rub* **An Analysis of Advanced Soft-Switching Techniques for DC–AC Power Converters Based on Auxiliary Circuits** *Kushan Lulbadda, Niranjan Shrestha, Ruvini De Seram, Sheldon Williamson, Tarlochan Sidhu*
	Sago **Workshop VISION 2030**
12:30-13:45	*Citron* **Lunch**
13:45-15:30	*Meyer* **Control Systems, Robotics and Mechatronics - II** **Adaptable Simulation Environment for LED Streetlight Dimming Control System** *Marina Gapit, Vinko Leši rÂusam Shaheen* **Model Predictive Control of Asynchronously Switched Systems with Exogenous Disturbances** *Tianyu Tan, Xinxin Shang, Liu Yang, Yang Shi* **Li-ion Battery Health State Estimation with Two Feed Forward Neural Networks** *Junghwan Lee* **Structural loads reduction in wind turbines via set-based control** *Ivan*

Wednesday, 5 April 2023

	Grabic, Mario Vašak **Radar and Infra-Red array Sensor Fusion in a Robotized Environment: An Experimental Study** *Alberto Minora, Leonardo Costa, Denys Tolochenko, Sanaz Kianoush, Vittorio Rampa, Stefano Savazzi* **Distributed lidar based control for cooperative transportation with multiple autonomous mobile robots** *stefano mutti, Giovanni Dimauro* **NTSM Based Adaptive Finite-time Synchronization for Bilateral Teleoperators with Asymmetrical Delay and Disturbances** *Shafiqul Islam*
	Sunburst **Cybersecurity of Industry Applications powered by 5G's capability of massive machine type communications (mMTC)** **SDR-Based 5G NR C-Band I/Q Monitoring and Surveillance in Urban Area Using a Helikite** *Sung Joon Maeng, Ismail Guvenc, Ozgur Ozdemir, Mihail Sichitiu, Magreth Mushi, Rudra Dutta, Monisha Ghosh* **Adaptive Frequency Hopping for 5G New Radio mMTC Security** *Wai Ming Chan, Hyuck M. Kwon, Remi A. Chou, David J. Love, Sonia Fahmy, Syed Rafiul Hussain, Sang Wu Kim, Chris Vander Valk, Christopher G. Brinton, Vuk Marojevic, Khanh D. Pham, Taejoon Kim* **Delay Optimal UAV Trajectory Planning for Secure Data Collection from Mobile IoT Networks** *AMIRAHMAD CHAPNEVIS, Eyuphan Bulut* **Distributed Power Allocation for 6-GHz Unlicensed Spectrum Sharing via Multi-agent Deep Reinforcement Learning** *Xiang Zhang, Arupjyoti (Arup) Bhuyan, Sneha Kumar Kasera, Mingyue Ji* **O-RAN Perspective on Industrial Internet of Things: A SWOT Analysis** *Talha Rahman, Minglong Zhang, Vuk Marojevic* **Energy-Efficient Secure Offloading for NOMA-Enabled Mobile-Edge Computing** *Yuan Zhou, Xiang Ma, Haijian Sun, Rose Qingyang Hu* **Bringing DNS Service to 5G Edge for Reduced Latencies in mMTC Applications** *Ricardo Harrilal Parchment, Diana Pineda, Kemal Akkaya, Alexander Perez-Pons, Abdullah Aydeger*
	Sago **Workshop VISION 2030**
15:30-16:00	*Level 3 Coffee Area* **Coffee break**
16:00-18:00	*Meyer* **AI and Industrial Informatics** **Flexible Activation Bag: Learning Activation Functions in Autoencoder Networks** *Hendrik Klopries, Andreas Schwung* **Utilization of ABC/XYZ analysis in retail sales forecasting using multivariate LSTM method** *Naomi Munitic, Mia Barzic, Luka Jelic, Vinko Lesic* **A Hybrid Continual Learning Approach for Efficient Hierarchical Classification of IT Support Tickets in The Presence of Class Overlap** *Yasmen Wahba* **Design and Implementation of Real-Time Fire Segmentation Algorithm on PYNQ Z2 FPGA** *Pratap Kygonahalli, Pranav Deshpande, Abhishek Hegde, Pranav Sasikumar, Akash Gupta, Payal Sharma, Manikandan J*

Wednesday, 5 April 2023

Multimodal camera for pedestrian detection with deep learning models *Adam Dradrach, Jakub Konert, Jacek Ruminski*
A Mixed Reality guidance system to assist the operator in the assembly process of complex products *Gennaro Gemito, Adolfo Santoro*
Multi-objective Sustainable Supplier Selection and Order Allocation Model using Interval-Valued Intuitionistic Fuzzy AHP *Ipek Eldem*
Smart intelligent system that can code like a human being *Vedant Jolly, Rishabh Jain, Jaiwin Shah*

Sunburst

Computational Intelligence and Signal and Image Processing

Human Age Prediction Based on Brain MRI Using Density-Based Regression *Ornela Bregu, NUHA ZAMZAMI, NIZAR BOUGUILA*
Data Synthesizing for Specific Human Action Segmentation *Xiaotian Lin, Leiyang Xu, Qiang Wang*
Using Image Pre-processing To Improve Navigation Line Extraction Based On Pix2Pix Net On Small-size Datasets *HAO ZHENG, QIANG WANG*
Maximum Likelihood-Based Estimation of Finite Multivariate Libby-Novick Beta Mixture Models in Medical Applications *Niloufar Samiee, Narges Manouchehri, Nizar Bouguila*
3D Multi-Views Object Classification Based on a Fully Generalized Dirichlet Allocation Model *Ahmed Yasser Eita, Hafsa Ennajari, Nizar Bouguila*
Hybrid Building Occupancy Estimation using Thermal Imaging and Environmental Sensing *Daniel Barros, António Miguel Rosado da Cruz, Sérgio Lopes*
Improved YOLOv5 Network with CBAM for Object Detection Vision Drone *An Jinsu, Muhamad Dwisnanto Putro, Priadana Adri, Kanghyun Jo*
Hyperspectral Image Classification using Spatial-Spectral WaveletCNN *Sarang Yogi, Aditya Wairkar, Aakash Sondagar*

Sago

Workshop VISION 2030

19:00-21:30

Veranda

Dinner

Thursday, 6 April 2023

08:00-09:30

Sago

Panel 2

09:30-10:00

Level 3 Coffee Area

Coffee break

10:00-12:00

Meyer

Power Electronics and Renewable Energy

Performance Improvement of Flexible Common Ground Flying Capacitor PV Inverter Using Model Predictive Control *Margarita Norambuena, Guillermo Huerta, Mokhtar Aly, Fernanda Carnielutti, Jose*

Thursday, 6 April 2023

	Rodriguez **Development of a Smart Photovoltaic Cell** *Zoi Agorastou, Vasiliki Gogolou, Ioannis Mandourarakis, Nick Rigogiannis, Eftichios Koutroulis, Stylianos Siskos, Nick Papanikolaou* **Alternative Feedback Quantizer Using Space Vector Modulation** *Matias Veillon, Eduardo Espinosa, Ricardo Lizana, Pedro Melín, Galina Mirzaeva, Marco Rivera, Neil Sepulveda* **Staircase Modulation for Asymmetric Inverters with Minimum WTHD** *Eduardo Espinosa, Matias Veillon, Pedro Melin, Carlos Baier, Jose Espinoza, J. C. Hernandez* **A Novel Approach of Planar Transformer Configuration for Reducing Parasitic Capacitances and Enhancing Resonant Converters Parameters** *Haitham Kanakri, Euzeli Cipriano Dos Santos, Jr., Maher Rizkalla* **Design of a Four Windings Coupled Inductors for High Frequency Converters Applications** *Loïc Duong, Kamal Al-Haddad, Cédric Somers* **Parameters Design of Composite Resonant Circuit for outputting Dual Frequency Signals with Different Frequency Ratios** *qingfeng liu, zhaoxia leng* **A Simple Control Algorithm to Reduce the DC Current Level in a CSI-UPQC** *Pedro Melin, Marcelo Reyes, Ruben Caro, Eduardo Espinosa, Carlos Baier, Jose Espinoza*
	Sunburst **Advances in Data-Driven Process Monitoring and Control for Intelligent Industrial Production Systems** **Dynamics Analysis of an Optimal Fourth-order Biparametric Jarratt-type Method** *Wenshuo Li, Xiaofeng Wang* **Feature extraction algorithm based on improved ORB with adaptive threshold** *\sAihua Zhang, Yuhao Li* **Game-Based Adaptive Optimization Approach for Multi-Agent Systems** *Hao Wang, Zheyuan Ning, Hao Luo, Yuchen Jiang, Mingyi Huo* **Time-domain Frequency Estimation Approach for Intelligent Control Systems** *Mingyi Huo, Xinyu Qiao, Hao Wang, Yuchen Jiang, Hao Luo* **EMD-KPCA based Short Circuit Fault Diagnosis Method for Battery Pack** *Yucheng Qian, Han Lin* **Real time enhancement of operator's ergonomics in physical human - robot collaboration scenarios using a multi-stereo camera system** *Gerasimos Arvanitis, NIKOS PIPERIGKOS, Christos Anagnostopoulos, Aris Lalos, Konstantinos Moustakas*
	Sago **Diversity & Inclusion**
12:00-13:15	*Citron* **Lunch**
13:15-15:00	*Meyer* **Advanced Decision-Making, Control and Estimation Technologies for Intelligent Vehicles** **Vehicle State Classification from Drone Image** *Youlkyeong Lee, Seongmin Kim, Choi Jehwan, Kanghyun Jo* **Attack-Resilience Distributed Model Predictive Control of Vehicular Platoon Systems using Moving Horizon Attack Estimation** *Jicheng*

Thursday, 6 April 2023

Chen, Hui Zhang, Zhi Qi

Kalman Filter-based Adversarial Patch Attack Defense for Multi-object Tracking in Autonomous Driving *Ru Yi, Jicheng Chen*

System Identification and Decoupling Controller Design for Fuel Cell Hydrogen Injection System *si long zhang, shaodong zhou, wenhao gan*

Analysis of Automatic Emergency Braking System Performance Insufficiency based on System Theory Process Analysis *Jicheng Chen, Silong Zhang, Shaodong Zhou*

Asymmetric Switching Angle Modulation for Cascaded Multilevel Power Inverters for Different Grid Support Functionalities *SHUO WANG*

Sensor Compliance Development for Smart Lift Safety Application based on IEEE 2668 *Yang WEI, Kim Fung Tsang, Hao Wang*

Sunburst

ICT enabled Healthcare

An IoT Oriented Ontology for Physical World Awareness in Autonomous Objects *Riccardo Brama, Helbert da Rocha*

Encryption and Authentication in Smart Transducers Implemented in RISC-V Softcore Processors *João Cassiano V. Fernandes, Helbert da Rocha, Antonio Espirito-Santo*

Federated Learning in Healthcare Industry: Mammography Case Study *Krystian Zieli G6¶Natalia Kowalczyk, Tomasz Kocejko, Magdalena Mazur-Milecka, Tomasz Neumann, Jacek Ruminski*

Keeping Workers Safe in Electric Working: A Robot System for High-Voltage Live Operation *Longqiang Wang, Ruohan Wang, Haiteng Wu, Geng Yang*

A Machine Learning Approach for Prostate Cancer Diagnosis from Clinical Biomarkers and Personalized Questionnaires *Moumen Elmelegy, Ahmed Mamdouh, Samia Abdel-Fattah, Mohamed Abo El-Ghaar, Ayman El-Baz*

Digital Twin Empowered Anomaly Prediction for Data Protection in Health Monitoring System *xinzheng Feng, Jun Wu, Wu Yang, Jianhua Li*

Circuit Design of Multimodal Attention Memristive Network for Affective Video Content Analysis *Xiaoyue Ji, Zhekang Dong, Chun Sing Lai*

Sago

Electronic Systems on Chip, Embedded Control and Nanotechnology

A Python Framework for System-on-Chip Power Integrity Simulation *Christina Panagiotopoulou, Anastasios Michailidis, Thomas Noulis, Kostas Siozios, Stylianos Siskos*

Reconfigurable LNA with On-Line Fine-Tuning of Linearity and Gain for 5G Industrial Communications Applications *Athanasios Stefanou, Vasilios Pavlidis, Alkiviadis Hatzopoulos*

A PYNQ-based Data Acquisition System for HIL Simulations on low-cost FPGAs *Thibaut Gravey, Karim Meddah, Téo Robert, Emmanuel Rutovic, Romain Monthéard, Tarek Ould-Bachir*

Phone Pick-up Authentication: A Gesture-Based Smartphone Authentication Mechanism *Dutliff Boshoff, Gerhard Hancke, Raphael Nkrow, Alexander Scriba*

Denoising of photoplethysmograms for non-invasive blood glucose estimation via Slant transform based bit plane method *Weizhi Guo,*

Thursday, 6 April 2023	
	Bingo Ling, Yiting Wei **Systolic peak detection of photoplethysmograms via regularity approach** *Yiting Wei, Bingo Ling, Qing Liu, Jiaxin Liu*