3rd IFSA Winter Conference
on Automation, Robotics & Communications
for Industry 4.0/5.0 (ARCI' 2023)

Conference Programme

22-24 February 2023

Chamonix-Mont-Blanc, France

Organized by:

Message from Chairman

On behalf of Organizing Committee I would like to welcome you to the 3rd IFSA Winter Conference on Automation, Robotics & Communications for Industry 4.0/5.0 (ARCI' 2023), 22-24 February 2023.

The Industry 4.0 holds a lot of potentials and is expected to register a substantial growth in the near future. According to the modern market study, the global Industry 4.0. Market size is projected to reach US $ 377.30 Billion by 2029, at a CAGR of 16.3 % during the forecast period, 2022-2029.

The Industry 4.0 / 5.0 is an integrated system, which consists of an automation tool, robotic control, communications and big data analytics. The increased adoption of industrial robots is one of the main driving factor of this market, while the data risks associated with integration of advanced technologies are the restraining factors.

There are several conferences on automation, robotics, communications and data analysis, but they are not meet the Industry 5.0 challenges. The series of annual IFSA's Winter ARCI conferences have been launched to fill-in this gap and provide a forum for open discussion of state-of-the-art technologies related to all, mentioned above, components of Industry 5.0.

The ARCI' 2023 conference will incorporate main fields covering research and development in a broaden range in automation, robotics, communication and data analyses, and united by the Industry 5.0 challenges. However it will be not a conference only about the future concepts and new visions. It will be also to discuss how to adopt the current R&D results for Industry 4.0/5.0 and to customize products under the conditions of highly flexible (mass-) production.

The ARCI' 2023 conference are covering research and development in a broaden range in automation, robotics and communication, and united by the Industry 5.0 challenges. The ARCI' 2022 conference is organized by the IFSA - one of the major professional, non-profit association serving for sensor industry and academy since 1999.

The purpose of ARCI' 2023 is bring together leading international researchers, developers and practitioners to attain synergetic exchanges of ideas and practices. We trust that you will find the ARCI 2023 conference professionally rewarding and stimulating as well as enjoyable. Welcome to ARCI' 2023 !

Prof., Dr. Sergey Y. Yurish
ARCI' 2023 Conference Chairman

Conference web site:

http://www.arci-conference.com/

Conferences Venue

The ARCI' 2023 Conference will take place in Le Majestic Congress Centre, Chamonix-Mont-Blanc, France. The Congress Center is situated in the center of Chamonix, in a walking distance from most of hotels and restaurants. The conference rooms are located on the ground floor of the former palace of the 20th Century. It has kept most of the original features of the buildings from "La Belle Epoques". Address: 241 allée du Majestic, Chamonix.

Registration

The Registration Desk is opened in the Le Majestic Congress Centre:

- Tuesday, 21 February 2023, from 19:00-21:00
- Wednesday, 22 February 2023, from 8:45-18:00
- Thursday, 23 February 2023, from 8:45-18:00
- Friday, 24 February 2023, from 8:45-16:00.

Language

The official language of the Conferences is English. There will be no simultaneous interpretation.

Insurance and Liability

The conferences organizers do not accept responsibility for any individual, medical, travel or personal insurance policies as necessary.

Conference Identification Tag

The Organizing Committee request that you wear your identification tag (badge) at all times during the conference. Your conference identification tag will serve as your admission to all conference paper presentation sessions.

Welcome Cocktail

21 February 2023, Tuesday (19:00-21:00). The Welcome Cocktail will take place in Le Majestic Congress Center. Do not miss this opportunity to say the first "hello" to attendees and committee members. The Registration will be opened at the Welcome Cocktail area.

Coffee/Tea Refreshment

Coffee/tea will be served at the times indicated in the programme near the conference room.

Gala Dinner

23 February 2023, Thursday (20:00-23:30). The Gala Dinner will take place in the Le Majestic Congress Center.

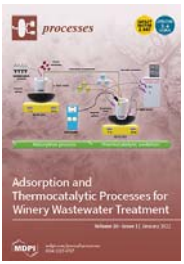
Local Time

The local time in Chamonix is: GMT+1, Paris.

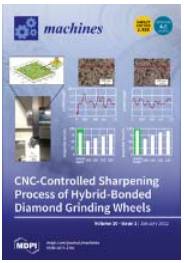
Post-Conference Publications

Selected and extended papers presented at the conference will be published in one of the following open access journals:

Sensors & Transducers
(ISSN 2306-8515,
e-ISSN 1726-5479)



MDPI Processes
(ISSN 2227-9717)



MDPI Machines
(ISSN 2075-1702)

Authors of full-page articles published in journals will be invited to extend their articles into the book chapters for the open access Book Series *'Advances in Robotics and Automatic Control: Reviews'*, Vol. 3 or '*Advances in Networks, Security and Communications: Reviews*', Vol. 3. Both books will be submitted to the Book Citation Index by Clarivate Analytics. These open access books will be published in 2023.

Organizing Committee

Chairman

Prof., Dr. Sergey Y. Yurish
(IFSA, Spain)

Advisory Chairman

Prof., Dr. Vijayakumar Varadarajan
(The University of New South Wales, Australia)

Conference and Publication Manager

Mrs. Tetyana Zakharchenko
(IFSA Publishing, S.L., Spain)

Organizing Committee

Mr. Javier Cañete
(Universitat Politecnica de Catalynya (UPC), Barcelona, Spain)
Mr. Luis Morey
(Universitat Politecnica de Catalynya (UPC), Barcelona, Spain)
Mr. Sergey Garmash
(IFSA Publishing, S.L., Spain)

Sponsors and Media Partners:

IFSA Publishing

processes an Open Access Journal by MDPI

SMC Soft Measurement and Computing Scientific journal

machines an open access journal by MDPI

Keynote Speaker I

Prof., Dr. Yu Ming Zhang
James R. Boyd Professor of Electrical Engineering,
University of Kentucky, Lexington, KY 40506, USA

Robotizing Welding Manufacturing via Human-Robot Collaboration and Deep Learning

Abstract: Skilled welders often outperform welding robots. To improve welding robots using human intelligence, the weld pool which welders respond to must be sensed. However, its specular nature disqualifies diffuse reflection-based laser triangulation methods. To overcome this issue, the mirror surface is advantageously used to reflect a laser pattern away from the arc, simultaneously eliminating the arc illumination problem. To allow welders to freely demonstrate their skills, a human-robot collaborative system has been established where a welder carries a virtual torch, similarly as operating an actual one, without a sensor. The movement is measured at the virtual system and then followed by robot which carries sensors and performs actual welding. The measured weld pool is displayed to the operator at the virtual site such that the welder can observe the change in the operation result to adjust his/her torch movement and other parameters. The true intelligence of the welder is thus contained for being extracted using deep learning. For more complex welding processes requiring multiple tools, their robotization is more challenging. A possible solution is also to learn from human welders as they are quicker learners who can adjust their operations to stabilize the complex welding process to generate training data.

Short Biography: Dr. Yu Ming Zhang is the James Boyd Professor of Electrical Engineering and College of Engineering's Director of International Partnerships at the University of Kentucky (UK). His research focuses on robotizing welding processes through machine vision-based intelligence for intelligent robotic and human-robot collaborative welding systems. He holds 12 US patents and has over 200 journal publications. His recognition includes Fellow of AWS, ASME, SME, and IEEE and Dean's Award for Excellence in Research from UK College of Engineering. Five of his graduate students won the IIW (International Welding Institute) Henry Granjon Prize on behalf of the US against IIW member countries' national winners for dissertation/thesis research. Dr. Zhang is currently an Area Editor for the *Journal of Manufacturing Processes* published by the SME. He is, and has been, Associate Editor/Editorial Board Member for a number of major international journals including the *IEEE Transactions on Automation Science and Engineering.*

Keynote Speaker II

Prof., Dr. Selwyn Piramuthu
Professor of Information Systems,
University of Florida, USA

Warehouse Automation through Drones, IoT, and Machine Learning

Abstract: Warehouse automation plays a significant role in efficient and effective storage and retrieval of objects, while also ensuring that these objects are physically handled with care and remain under ambient conditions that are deemed appropriate. While manual warehouse processes can be used to accomplish the same, automation ensures consistency in associated processes, with improved performance of the entire system. For example, automation can speed up processes such as pick-and-place operations and at the same time experience relatively few (human-introduced) errors such as those that are observed in manual systems.

We consider the use of drones and Internet of Things (IoT) devices such as RFID (Radio-Frequency Identification) tags to automate warehouse operations. The RFID tags are used to uniquely identify and locate objects in the warehouse and to measure the object's ambient conditions through on-board sensors when appropriate and necessary.

The drones are used to locate objects and their locations, as well as help with pick-and-place operations. We use machine learning to learn the patterns in these systems to automate associated processes.

Short Biography: Selwyn Piramuthu is Professor of Information Systems and Operations Management at the University of Florida, where he has taught since Fall 1991. Trained in machine learning, his research interests also include cryptography with applications related to IoT/RFID, privacy/security, supply chain management, among others. His (co-authored with Wei Zhou) book titled, "*RFID and Sensor Network Automation in the Food Industry*" was published by Wiley in 2016.

He received his B.Tech., M.S., and Ph.D. respectively from IIT-Madras, University of Arizona, and University of Illinois at Urbana-Champaign.

Keynote Speaker III

Prof., Dr. Jingshan Li
Department of Industrial Engineering,
Tsinghua University, Beijing, China

Sustainable Manufacturing Systems: Smart Planning and Operation for Energy-Efficient and Environment-Friendly Manufacturing

Abstract: In order to respond to climate change, carbon peak and carbon neutral become the strategic goals worldwide. Manufacturing is ranked the 3rd in both energy consumption and greenhouse gas emissions, and the 1st in toxic releases. Therefore, manufacturing must be sustainable, i.e., green. Sustainable manufacturing systems are of significant importance to the worldwide economy, supply chain, and societal benefits. It typically includes two parts: The 1st is manufacturing systems of green technology or renewable energy products. While the 2nd is related to scheduling, control, and optimization of manufacturing processes to reduce energy consumption and emissions. In this presentation, we will review the recent progresses in sustainable manufacturing systems, and focus on analysis, design and optimization of sustainable manufacturing systems. Specifically, through examples in battery manufacturing, energy-intensive production, and system redesign, we introduce smart planning and scheduling methods to redesign and reorganize processes and operations, to achieve energy-efficient and environment-friendly manufacturing.

.

Short Biography: Dr. Jingshan Li is the Head and Gavriel Salvendy Chair Professor in Department of Industrial Engineering, Tsinghua University, Beijing, China. He received BS, MS, and PhD degrees from Tsinghua University, Chinese Academy of Sciences, and University of Michigan, in 1989, 1992 and 2000, respectively. Before joining Tsinghua University in 2021, he was with General Motors R&D Center, University of Kentucky, and University of Wisconsin-Madison. Dr. Li has published 2 textbooks, 7 book volumes, and more than 270 refereed journal articles, book chapters, and conference proceedings. He has been the Senior Editors, Associate Editors, and Chairs of many top journals and conferences. He has been the Chairs of IEEE Technical Committees on Sustainable Production Automation, and Healthcare Management Automation. Dr. Li is an IEEE and IISE Fellow, and IEEE Distinguished Lecturer in robotics and automation. He received many awards such as NSF CAREER Award, IEEE Robotics and Automation Early Career Award, and multiple Best Paper Awards.

Keynote Speaker IV

Prof., Dr. Subhabrata Banerjee
Department of Electronics and Communication Engineering, Institute of Engineering and Management, Kolkata, India

Superposition Modulation based Intelligent Coding Scheme & Its Impact on 3G and 4G Mobile Communication Systems

Abstract: Performance estimation of various kinds of Turbo Codes (TCs) and their applications in modern communication systems (3G and 4G communication) have been emerged as one of the potential research areas in recent past. Moreover, lower error rates (down to 10-8) are required for the implementation of the real time and more demanding applications such as TV broadcasting or videoconferencing. Improvement in BER performance is accomplished either by implementing optimum power allocation based 3D-TC or by designing of 4D-TC structure.

A modified interleaver driven binary 4-Dimensional Turbo Code (4D-TC) using Superposition Modulation (SM) technique is projected to intensify the Minimum Hamming Distance (MHD). The MHD of the proposed structure is amplified by incorporating feedback polynomial in primitive form for a fixed interleaver length as well as by introducing a modified interleaver for scattering and mixing the incoming bits in an appropriate manner. Furthermore, upper bound of the proposed structure is evaluated and asymptotic behaviour of the proposed code is analysed in terms of dmin by adopting two analytical approaches namely finite length rule and asymptotic spectral shape function.

The asymptotic weight distribution is reconnoitred to show that dmin asymptotically grows linearly with the block lengths. Finally, 4DTC (8-states as well as 16-states) with three different versions of the TCs namely, PCCTC, SCCTC and conventional 3D-TC along with Superposition Modulation Scheme have been used in 3G & 4G communication systems for enrichment of BER performances.

Short Biography: Dr. Subhabrata Banerjee is a Professor in the department of Electronics and Communication Engineering, Institute of Engineering & Management, Kolkata, India. He was awarded National Scholarship by WBED, West Bengal Government. He received his M. Tech. and PhD degrees in Electronics and Telecommunication Engineering from renowned Jadavpur University, Kolkata, India. He initially worked as Programmer Analysist in Cognizant Technology Solution and then was working as Assistant Professor in the Department of Electronics and Communication Engineering at Future Institute of

Engineering and Management, Kolkata, India and as Associate Professor in the same institution thereafter. He is now working as Professor in Institute of Engineering and Management, Kolkata, India since 2021. He was authored numerous articles published in prestigious journals including Wireless Personal Communication (Springer), Personal and Ubiquitous Computing (Springer), International Journal of Communication Systems (Wiley) and Institution of Engineering and Technology (IET, UK). He has published more than 30 papers in International Conferences and International Journals of repute. He also published book chapter under IET, UK publication. He has also published a book named Genetic Algorithms and Machine Learning for Python Programmers. His current research interests include Communication and Coding Theory, Machine Learning, Robotics, IOT, Control System, and Evolutionary Algorithms, Soft Computation.

Keynote Speaker V

Prof., Dr. Yuchen Jiang
Harbin Institute of Technology (HIT), Department of Control Science and Engineering, China

Countermeasures of Stealthy Cyberattacks: From a System and Control Perspective

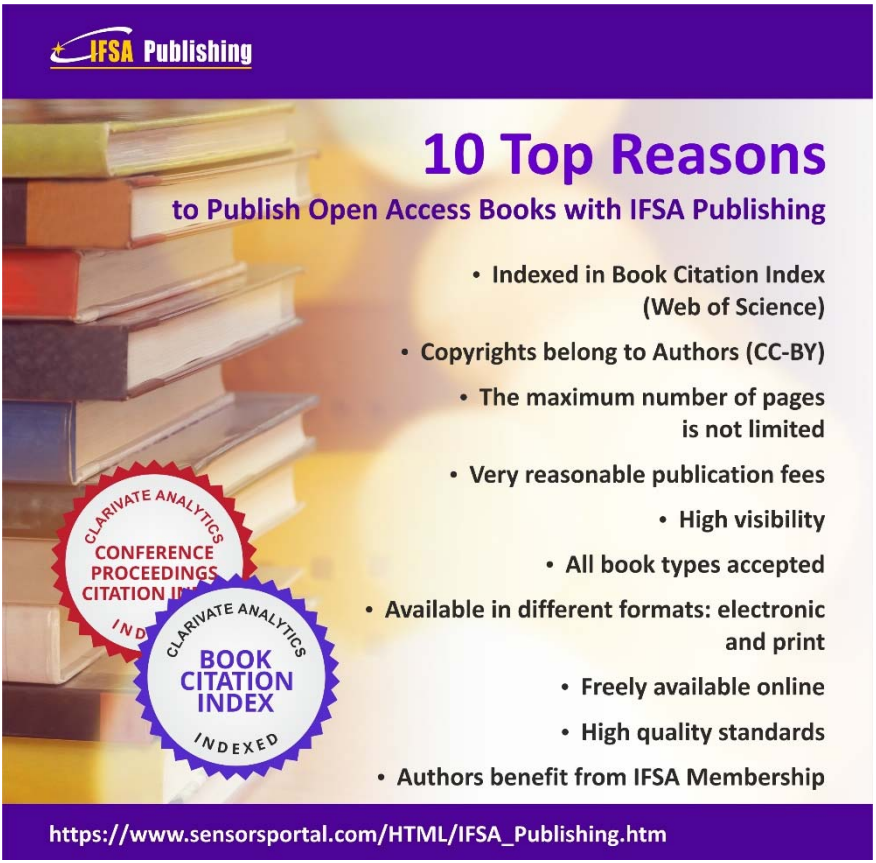
Abstract: It has been over ten years since the Stuxnet virus intruded into and caused actual damages to the real-world industrial facilities. While it was a big shock to the industry worldwide and raised significant concerns in safety and security, such novel types of attacks to industrial cyber-physical systems have been extensively studied in recent years.

In this presentation, we will dive to the monitoring and control level of industrial systems and explore the mechanisms of cyberattacks to control systems. Especially, we will explain about the design principles of stealthy attacks and some typical countermeasures to defend such threats, in terms of prevention, detection, and mitigation.

Short Biography: Dr. Yuchen Jiang is an Assistant Professor with Harbin Institute of Technology (HIT). He received the B.E. degree in automation and the Ph.D. degree in control science and engineering from HIT. His research interests include data-driven process monitoring, fault diagnosis and prognosis, industrial cyber-

physical systems, and artificial intelligence. Dr. Jiang is the author/co-author of 50+ scientific publications (some of them are ESI highly cited papers) and the PI of several research projects.

Dr. Yuchen Jiang is the co-author of Book chapter 'Data-driven approaches to fault-tolerant control of industrial robotic systems' published in Fault Diagnosis and Fault-tolerant Control of Robotic and Autonomous Systems in 2020. Dr. Jiang is IEEE Member, member of several technical committees and reviewer of 20+ journals and conferences.



Programme at Glance

Date / Time (GMT+1)	22.02.2023 Wednesday	23.02.2023 Thursday	24.02.2023 Friday
8:45-9:00	Registration	Registration	Registration
9:00-9:15	* Opening Session (Sergey Y. Yurish, Chairman)	* Daily Notifications	* Daily Notifications
9:15-10:00	Keynote Speaker I	Keynote Speaker III	Keynote Speaker V
10:00-10:30	*Coffee Break*	*Coffee Break*	*Coffee Break*
10:30-12:30	Regular Session: Robotics	Regular Session: Industry 4.0/5.0: Smart Manufacturing, Process Control and Monitoring	Virtual Session III:
12:30-13:30	*Lunch on your own*	*Lunch on your own*	*Lunch on your own*
13:30-14:15	Keynote Speaker II	Keynote Speaker IV	Special Session: Modeling and Controlling of Complex Autonomous Systems and Robotics (Zoom)
14:15-16:15	Regular Session: Automation	Regular Session: Communications	
16:15-16:45	*Coffee Break*	*Coffee Break*	*Poster Session & Farewell Cocktail*
16:45-17:45	Virtual Session I	Virtual Session II	
17:45-18:15			* Closing Session (Sergey Y. Yurish, Chairman)
18:15-20:00	-	-	-
20:00-23:30	-	Gala Dinner	-

* - must attend sessions

The time in the table and in the technical programme below is the local time in Chamonix: GMT+1, Paris.

Technical Conference Programme

Day 1
22 February 2023, Wednesday

Regular Session: Robotics

Chairman: Prof., Dr. Yu Ming Zhang
University of Kentucky, USA

1. **Complex Mutli-Robot Hybrid Platform for Augmented Virtual Skiing Immersion**
   Taha Houda, Ayman Beghdadi, Lotfi Beji and Ali Amouri (France)

2. **Vehicle Localization by Optimally Weighted Use of MEMS Sensor Data**
   Takayoshi Yokota and Taiga Yamagiwa (Japan)

3. **Robotic Bioprinting: a 7 Degree of Freedom Robotic Arm Towards Volumetric Printing for Tissue Engineering**
   Vivek Cherian David, Maria Kalogeropoulou, Pierpaolo Fucile and Lorenzo Moroni (The Netherlands)

4. **Collaborative Environment Based on Strategic Engineering to Improve Efficiency and Reduce Vulnerabilities of Marine and Underwater Critical Infrastructures**
   Agostino Bruzzone, Marina Massei and Antonio Giovannetti (Italy)

Regular Session: Automation

Prof., Dr. Selwyn Piramuthu
University of Florida, USA

1. **Monitoring Weld Penetration by Training A Deep Learning Model Using Inaccurate Labels (Invited)**
   Rui Yu, Yizhe Chen, Jin Zhang, Qiang Ye and Yuming Zhang (USA)

2. **IOTA Data Preservation Implementation for Industrial Automation and Control Systems**
   Iuon-Chang Lin, Pai-Ching Tseng, Yu-Sung Chang and Tzu-Ching Weng (Taiwan)

3. **Comparison of an Electric Drive with a Mechanical Drive in Mobile Machines**
   Wolfgang Aumer (Germany)

4. **Revisiting a Matrix Characterization of Spanning Tree Based on a LaSalle Invariance Principle**
   Ti-Chung Lee and Yc Su (Taiwan)

5. **Impact of the Programming Language Used to Solve a LMI Problem on the Fault Resilience of Cyber-Physical Systems**
   Fatima Nabor Lagunes, Jerome Bosche and David Lara Alabazares (Mexico, France)

Virtual Session I:

Chairman: Prof., Dr. Sergey Y. Yurish
IFSA, Barcelona, Spain

1. **Federated Learning Model of Multi Key Homomorphic Encryption on the Basis of Internet of Things**
   Ran Zhai, Xuebin Chen, Ruikui Ma and Langtao Pei (China)

2. **Building an Ad Hoc Network with LoRa and Transferring Field Data to the Internet**
   Klaus Peter Neitzke and Heidi Schell (Germany)

3. **Deep Learning Based Anomaly Detection for Predictive Maintenance**
   Yacine Rebahi, Benjamin Hilliger, Bogdan Andrei Lepadatu and Alberto Cardoso (Germany, Romania, Portugal)

4. **Software in the Loop Simulation of Robotic Systems**
   George Hassapis, Dimitrios Chasapis, Grigorios Kalogiannis and Sophia Sirianidou (Greece, Spain)

5. **Exploring Applications of Industry 4.0 and Lean Manufacturing Technology Within a Product Label Manufacturer: A Simulation Case Study**
   Stefan Harrison and Boppana Chowdary (Trinidad and Tobago)

Day 2
23 February 2023, Thursday

Regular Session:
Industry 4.0/5.0: Smart Manufacturing, Process Control and Monitoring

Prof., Dr. Jingshan Li
Tsinghua University, Beijing, China

1. **A Rula-based Assessment Framework Based on Machine Vision and Zero-defect Manufacturing 4.0 Initiative**
   Foivos Psarommatis, Victor Azamfire and Fotios Konstantinidis (Norway, Sweden, Greece)

2. **Artificial Intelligence Assisted Ultrasonic Technology for Efficient Seaweed Material Recovery**
   Sintija Ozolina, Andrejs Kukuskins and Uldis Zaimis (Latvia)

3. **Generative Anomaly Detection in Multivariate Time Series**
   Maximilian Hoh, Alfred Schöttl, Henry Schaub and Nico Leuze (Germany)

4. **On the Application of Graphene Coatings to Prevent Local Metal Surface Overheating**
   Uldis Žaimis (Latvia)

5. **Optimizing Unmanned Surface Vehicle Performance for Water Body Monitoring**
   Andrejs Kukuskins, Uldis Zaimis and Sintija Ozolina (Latvia)

Regular Session:
Communications and Networks

Chairman: Prof., Dr. Uldis Zaimis
Liepaja University, Latvia

1. **Security Solutions for Industrial Radio Systems**
   Andreas Weinand, Michael Karrenbauer and Hans D. Schotten (Germany)

2. **Industrial 5G to Boost Data-Driven IIoT Applications – Opportunities and Barriers**
   Jari Collin, Jarkko Pellikka and Jyrki Penttinen (Finland, USA)

3. **PIN Theft Attack Against FIDO2 Security Keys**
   Emin Huseynov (Azerbaijan)

4. **VPN Helper Application for Using FIDO2 Security Keys with Legacy VPN Systems**
   Emin Huseynov (Azerbaijan)

Virtual Session II:

Chairman: Prof., Dr. Sergey Y. Yurish
IFSA, Barcelona, Spain

1. **Collaborative Robots and Set of Sensors for Learning by Demonstration**
   Aïcha Rizzotti-Kaddouri, Marc Kunze, Loick Jeanneret and Luc Depierraz (Switzerland)

2. **General Guidance for the Realization of Smart Retrofitting in Legacy Systems for Industry 4.0**
   Eusebio Lopez, Gabriel Luna Sandoval, Baldomero Lucero VelÁzquez, Francisco Javier Ochoa Estrella, Flavio Muñoz Beltrán, Juan José DelfÍn Vázquez and Francisco Cuenca Jiménez (Mexico)

3. **Semi-active Damper Suspension Road Estimation and Control Based on Neural Networks**
   Diana Hernandez-Alcantara, Luis Amezquita-Brooks and Luis Rivera-Perez (Mexico)

4. **Gamification for Machinery and Infrastructure Learning in Industries: a Review**
   Marco Fiore and Marina Mongiello (Italy)

5. **Industry 4.0 and the Covid-19 Pandemic: Literature Review**
   Mephtaha Guennoun and Fatima Bennouna (Morocco)

Day 3

24 February 2023, Friday

Virtual Session III:

Chairman: Prof., Dr. Sergey Y. Yurish
IFSA, Barcelona, Spain

1. **Advanced Control of a Distributed Parameter System**
   Xueru Fan, Cheng-Zhong Xu and Chunhai Kou (China)

2. **Deployment of Digital Twin in Robotics and Autonomous Driving Using ROS Architecture**
   Muhammad Ishfaq Hussain, Muhammad Aasim Rafique, Sayfullokh Khurbaev, Junbom Pyo, Taweook Kim, Brian J d'Auriol and Moongu Jeon (South Korea)

3. **An Application of Fuzzy Competition Graphs at Analog Circuits Analysis**
   Malinka Ivanova (Bulgaria)

4. **Distributed Virtual Commissioning Implementation of an Aeronautic Shopfloor**
   Ahlam Abassi, Jesus Hiram Lugo Calles, Rafael Balderas Hill and Nicolas Lassabe (France)

5. **Surgical Robotics in Poland – the Future, Opportunities and Threats**
   Małgorzata Sieradzka and Jarosław Wierzbicki (Poland)

Special Session:
Modeling and Controlling of Complex Autonomous Systems and Robotics

Chairman: Prof., Dr. Mellouli El Mehdi
University of Sidi Mohamed Ben Abdellah, Morocco

1. **A Single Input-feedback Control of the Generalized Kuramoto-Sivashinsky Equation**
   Rasha Al Jamal and Nejib Smaoui (Kuwait)

2. **A Single Actuator vs. Multi Actuators Design of an Input-Feedback Control to the Korteweg-de Vries-Burgers-Kuramoto-Sivashinsky Equation**
   Rasha Al Jamal and Nejib Smaoui (Kuwait)

3. **Triangular Observer-Based Integral Sliding-Mode Control for Wind System Energy**
   Sanae El Bouassi, Zakaria Chalh and El Mehdi Mellouli (Morocco)

4. **Fast Terminal Sliding Mode Control of the Active Suspension System**
   Badre El Kassmi, Abdelhamid Hmidani and El Mehdi Mellouli (Morocco)

5. **Backstepping Control Method Combined with Fuzzy Logic for an Anti-Lock Braking System**
   Najlae Jennan and El Mehdi Mellouli (Morocco)

6. **Sliding Mode Control Combined with Neural Networks for Two-Link Robot**
   Ayoub Belkheir and El Mehdi Mellouli (Morocco)

Poster Session:

1. **Design and Implementation of Time Aware Buffer for Scheduling Time Sensitive Packets in Deadline Aware Networks**
   Steven Lee and Tsung-Ying Yang (Taiwan)

2. **Transition Towards IEC-61499 in Factory Environment Through a Learning Factory Approach**
   Michele Foletti, Paolo Pedrazzoli, Matteo Confalonieri, Andrea Ferrario, Fabio Daniele and Lorenzo Agbomemewa (Switzerland)

3. **Development of Laser Cleaning Technology and its Potential for Process Automation**
   Rafal Kozera, Bartlomiej Przybyszewski and Michal Gloc (Poland)

4. **A Neurosurgical Robot for Brain Tumor Ablation under MRI**
   Qingpeng Ding, Wanquan Yan, Jianghua Chen, Kim Yan, Chun Ping Lam and Shing Shin Cheng (Hong Kong)

5. **Test Strip for Surface-enhanced Raman Spectroscopy, Method for its Preparation and use Thereof**
   Zuzana Chaloupková and Václav Ranc (Czech Republic)

6. **Reinforcement Learning-Based Odometry Prediction Network Trained Without Ground-Truth**
   Yeongmin Ko, Junbom Pyo, Yeonsu Seol and Moongu Jeon (South Korea)

7. **Advanced Methods for Anomaly Detection and Event Recognition by IoT Sensors Immersed in Heterogeneous and Evolving Environments**
   Redwane Ait-Ouammi (France)

8. **Implementation of a Novel Handheld Endoscopic Operation Platform (EndoGRASP)**
   Chun Ping Lam, Ming Ho Ho, Shi Pan Siu, Lap Wing Cheung, Flora Leung, Man Fung Chan, Yeung Yam and Ka Chun Lau (Hong Kong)

9. **The Industrial Digital Energy Twin as a Tool for Comprehensive Optimization of Industrial Processes**
   Alejandro Rubio Rico, Fernando Mengod Bautista, Andrés Lluna Arriaga and Vicente Luis Fuster Roig (Spain)

10. **Detection of Graphene Oxide in Single HeLa Cells Based on MCR-Raman Spectroscopy**
    Zuzana Chaloupkova, Jan Belza and Katerina Polakova (Czech Republic)

11. **Relative Exact Controllability of Fractional Linear Systems with Delays in Control**
    Jerzy Klamka (Poland)

Advances in Robotics and Automatic Control: Reviews

Sergey Y. Yurish, Editor

Industrial robots offer many benefits, including cost reduction, increased rate of operation and improving quality, along with improved manufacturing efficiency and flexibility. The demand for industrial robotics is majorly observed in industries such as automotive, electrical & electronics, chemical, rubber & plastics, machinery, metals, food & beverages, precision & optics, and others. In its turn, industrial automation control market will witness considerable growth during the same period with the growing demand of products such as sensors, drives and various robots.

The first volume of the 'Advances in Robotics and Automatic Control: Reviews', Book Series started by IFSA Publishing in 2018 contains ten chapters written by 32 contributors from 9 countries: Belgium, China, Germany, India, Ireland, Japan, Serbia, Tunisia and USA.

This book will be a valuable tool for those who involved in research and development of various robots and automatic control systems.

IFSA Publishing

http://www.sensorsportal.com/HTML/BOOKSTORE/Advances_in_Robotics_and_Automatic_Control_Vol_1.htm

Sponsored by:

machines
an Open Access Journal by MDPI

processes
an Open Access Journal by MDPI

SMC Soft Measurement and Computing
Scientific journal