



**5th IFSA Winter Conference
on Automation, Robotics & Communications
for Industry 4.0/5.0 (ARCI' 2025)**

**1st International Conference
on Drones and Unmanned Systems
(DAUS' 2025)**

Conference Programme

**19-21 February 2025
Granada, Spain**



Organized by:



Message from Chairman

On behalf of Organizing Committee, I would like to welcome you to the 5th *IFSA Winter Conference on Automation, Robotics & Communications for Industry 4.0/5.0 (ARCI' 2025)* and the 1st *International Conference on Drones and Unmanned Systems (DAUS' 2025)*, which will be held in Granada (Spain) on 19-21 February 2025.

This conference umbrella provides a unique platform for presentations, discussions, and information exchange, as well as the latest theoretical and experimental research results in the relevant fields. They bring together researchers, developers, and practitioners from various domains, including international scientists and engineers from universities, research institutes, and companies, to present and discuss the latest achievements in automation, robotics, communications, drones and unmanned systems.

In addition to technical discussions, an important part of these events is the opportunity for participants to meet colleagues and potential partners for joint research projects. This aspect of our IFSA events has always received high marks, and we continue to pay special attention to it. During coffee breaks, pre-conference visit, welcome cocktail, gala dinner and farewell cocktail, participants will have the chance to make new social connections.

The conferences are organized by the international, non-profit, professional association IFSA serving the industry and the academic community since 1999, in cooperation with the IFSA Group's company - *IFSA Publishing, S.L.* (Spain), and media partners and publishers — *MDPI* (Switzerland) and *SCIEPublish* (China).

We are confident that your participation in these conferences will bring you both professional satisfaction and inspiration, as well as an enjoyable experience. Welcome to ARCI' 2025 and DAUS' 2025 !

Prof., Dr. Sergey Y. Yurish
Chairman

Conferences Venue

The Conferences will take place in the modern 5-star Barceló Granada Congress Hotel. The hotel is situated just in a few minutes from the historic centre, makes it the perfect base for visiting the main tourist attractions, 30 km from the spectacular Sierra Nevada Mountain ski resort, and 65 km from the tropical Mediterranean coast. It also has excellent connections with the national rail network and is just 16 minutes from Granada Airport (18.3 km). Address: Maestro Montero, 12, Ronda District, 18004 Granada, Spain.

Registration

The Registration Desk is opened in the Barceló Granada Congress Hotel:

- Tuesday, 18 February 2025, from 20:00-21:30
- Wednesday, 19 February 2025, from 8:45-18:00
- Thursday, 20 February 2025, from 8:45-18:00
- Friday, 21 February 2025, 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.

Pre-Conference Visit

18 February 2025, Tuesday (14:00-18:00) – visit to the vineyard (Bodegas Calvente) where it is installed the 'Baetic experimental plot' belonging to the soil living lab 'Granada Tierra Viva', managed by EGEMAP (Terra Lab UGR 2 i (<http://www.egemap.eu>). The bus will start at 14:00 from the hotel's entrance. The experimental plot is situated in 25 km from Granada (Restaurante Loma del Valle). Then, 20-minutes walk through a nice cultivated area and arrival to the vineyard to see fly drones (you can bring your own model to show it), sensors systems and agrometeo station. At 18:00 the bus will return to the hotel. The visit will be possible in the case of good weather.

Welcome Cocktail

18 February 2025, Tuesday (20:00-21:30). The Welcome Cocktail will take place in Barceló Granada Congress Hotel and include a wine testing, organized by *Calvente Wineries* (<https://bodegascalvente.com>). Do not miss this opportunity to say the first "hello" to attendees, committee members and test five wines and cheeses! The Registration will be opened at the Welcome Cocktail area.

Coffee/Tea Refreshment

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

Gala Dinner

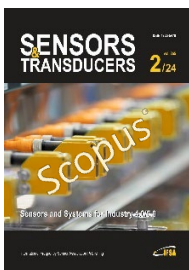
20 February 2025, Thursday (20:00-23:00). The Gala Dinner will take place in Barceló Granada Congress Hotel, Granada V, Patio 2, the next to the garden on the Floor 0).

Farewell Cocktail

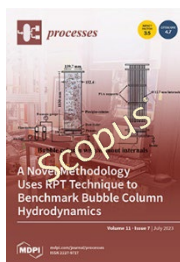
21 February 2025, Friday, 16:30. The Welcome Cocktail will take place in Barceló Granada Congress Hotel (coffee breaks area) and followed by the Poster and Closing Sessions.

Post-Conference Publications

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



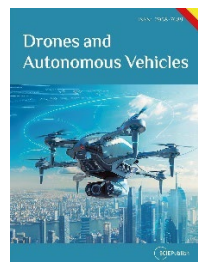
Sensors & Transducers
(ISSN 2306-8515,
e-ISSN 1726-5479)



MDPI Processes
(ISSN 2227-9717)



MDPI Machines
(ISSN 2075-1702)



Drones and Autonomous Vehicles (ISSN: 2958-7689)

Authors will be also invited to extend their articles into the book chapters for the open access Book Series 'Advances in Robotics and Automatic Control', Vol. 4/5, 'Advances in Networks, Security and Communications', Vol. 3/4 or 'Advances in Intelligent Systems', Vol. 3/4. These books will be published in 2025 and submitted for the indexing to the Book Citation Index by Clarivate Analytics.

Organizing Committee

Chairman

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

Advisory Chairmen

Prof., Dr. Vijayakumar Varadarajan
(Ajeenkya D Y Patil University India & La Trobe University, Australia)

Prof, Dr. Prasad Mukesh
(University of Technology Sydney, Australia)

Conference and Publication Manager

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

Organizing Committee

Prof., Dr. Jesús Rodrigo-Comino
(University of Granada, Spain)

Mr. Javier Cañete
(Universitat Politecnica de Catalunya (UPC), Barcelona, Spain)

Mr. Vyacheslav Mytsay
(IFSA Publishing, S.L., Spain)

Local Time

The local time in Granada is: GMT+1, Madrid.

Conferences' Web Sites

ARCI' 2025: www.arci-conference.com

DAUS' 2025: www.daus-conference.com

Sponsors and Media Partners:



Keynote Speaker I



Prof., Dr. Dylan Cawthorne
University of Southern, Denmark

The Ethics of Drone Design: How Value Sensitive Design Can Create Better Technologies

Abstract: Drones are being designed and used for an increasing number of applications, from wildlife ecology, to healthcare, to security and defense. But what human values do these technologies support? Do they enhance welfare, privacy, safety, trust, environmental sustainability, social justice? If not, how do we design them differently – how do we make better technologies? This talk presents value sensitive design - an ethically-informed approach to technological development – and shows how it has been used to create drones that benefit society. Rather than being “armchair philosophy”, this applied ethics methodology leads to practical design solutions and assists in the translation of abstract human values into concrete design requirements. The speaker will showcase several drones developed using value sensitive design - for wildlife monitoring in Kenya, transportation of urgent medical samples in Denmark, and education in Sierra Leone. The talk will conclude with a multitude of recommendations for making ethically-informed drones in the future. The ethics of drone design should be relevant to everyone in the drone industry, and especially for scholars, engineers, companies, governments, and citizens alike.

Short Biography: Dylan Cawthorne is an Associate Professor at the Drone Center at the University of Southern Denmark in Odense. He tries to make the world a better place using ethics, technology, and art. Dylan is an interdisciplinary researcher, champion for the use of ethics and human values in engineering, and an activist engineer. His main area of research is using value sensitive design methods and ethical principles to design and build prototype drones. He recently published the first book on the value sensitive design of drones: '*The Ethics of Drone Design*'.

Keynote Speaker II



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

How Useful are Drones in Supply Chains

Abstract: The last several years have witnessed increasing adoption of drones for civilian applications ranging from agriculture, emergency response, and exploration through transportation. Given the diverse nature of supply chains, it is no surprise that drones are also being used in supply chain applications. Specific applications include those from farms all the way to the end consumer. With the introduction various types of technologies such as satellite imaging and geolocation during the last four decades to the recent use of sensor- and actuator-based automated systems shows tremendous promise for precision agriculture as the need for more food arises with the increasing world population. At the other end of the supply chain, drones are being used in last mile delivery applications. We critically consider drone-based applications with their respective non-based counterparts to determine the utility brought to these applications by drones.

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



Mr. Rick Spaulding
*Sr. Wildlife Biologist,
ManTech Advanced Systems International,
Bainbridge Island, WA, USA*

The Use of Drones in Wildlife Ecology: Future Challenges and Opportunities

Abstract: The presentation will provide an overview of the future challenges and opportunities with drones in their use in wildlife ecology. The topic can be broken down into essentially two groups: those related to the technical and hardware-related issues with the drone platform itself and those related to public perception of drones, drone regulations, data collection, and best practices to avoid and minimize impacts to target wildlife species from drone operations. In addition, the communication among wildlife biologists and the sharing of information and lessons learned from the use of drones is paramount to the successful use of drones in wildlife ecology. Invaluable communication and sharing of success and lessons learned occurs through peer-reviewed scientific journals, professional societies, and conferences like DAUS 2025. Professional societies such as The Wildlife Society and the Drone Working Group foster communication between wildlife biologists in academic, government, and private sectors as well as drone vendors. This communication improves drone operations not only for better data collection and management, but also fosters changes and advances in drone design and sensor capabilities to facilitate efficient and less intrusive use of drones in wildlife ecology to avoid and minimize adverse impacts to wildlife. In addition, and most importantly, communication provides valuable dialogue to increase awareness of drones for conducting wildlife management and survey activities and to promote their safe and ethical use by users in universities, federal and state governments, and the private sector, including non-governmental organizations.

Short Biography: Mr. Spaulding is a Senior Wildlife Biologist/Project Manager with 30 years of experience in conducting wildlife surveys. He is an FAA Part 107 certified drone pilot and has employed drones to conduct wildlife and habitat surveys. Rick founded and is past Chair of The Wildlife Society (TWS) Drone Working Group. He has organized drone symposia at the annual TWS conferences in 2020, 2021, 2022, and 2024 and co-organized the 2023 Wildlife Conservation Drones & Technologies Summit. Rick is co-editor of *A Manual for Drone Applications in Wildlife Research, Management, and Conservation* to be published in late 2025.

Programme at Glance

Day 1:
19 February 2025, Wednesday

Time / Room	Room Andalusia IV (former Mirador de la Reina) (ARCI' 2025)	Room Andalusia II+III (former Mocarabes I+II) (DAUS' 2025)
8:45-9:00	Registration (8:45 to 18:00)	
9:00-9:15	* Opening Session (Prof., Dr. Sergey Y. Yurish, Chairman)	
9:15-10:00	Keynote presentation: The Ethics of Drone Design: How Value Sensitive Design Can Create Better Technologies (Prof., Dr. Dylan Cawthorne, University of Southern, Denmark) (<i>Conference Room: Mocarabes I+II</i>)	
10:00-10:30	Coffee Break	
	Parallel Sessions:	
10:30-12:30	Regular Session: Automatic Control	Regular Session: Unmanned Aircraft Vehicles (UAV) and Systems
12:30-13:30	Lunch on your own	
	Parallel Sessions:	
13:30-15:30	Regular Session: Robotics I	Regular Session: Unmanned Underwater Vehicles (UUV), Uncrewed Surface Vessels (USV) and Systems
15:30-16:00	Coffee Break	
16:00-18:00	Regular Session: Robotics II	Special Session: Drones to Access Earth's Surface Processes and Landforms

* The must attend session.

Day 2:
20 February 2025, Thursday

Time / Room	Room Andalusia IV (former Mirador de la Reina) (ARCI' 2025)	Room Andalusia II+III (former Mocarabes I+II) (DAUS' 2025)
8:45-9:00	Registration (8:45 to 18:00)	
9:00-9:15	* Daily Notifications (Prof., Dr. Sergey Y. Yurish, Chairman)	
9:15-10:00	Keynote presentation: How Useful are Drones in Supply Chains (Prof., Dr. Selwyn Piramuthu, University of Florida, USA) (<i>Conference Room: Mocarabes I+II</i>)	
10:00-10:30	<i>Coffee Break</i>	
	<i>Parallel Sessions:</i>	
10:30-12:30	Regular Session: Industry 4.0 / 5.0	Regular Session: Drones Applications in Industry Military and Agriculture
12:30-13:30	<i>Lunch on your own</i>	
	<i>Parallel Sessions:</i>	
13:30-15:30	Regular Session: Networks & Communications	Special Session: Innovative UAV System
15:30-16:00	<i>Coffee Break</i>	
16:00-18:00	Regular Session: Smart Manufacturing	Student Special Session: UAS
18:00-20:00	-	-
20:00-22:30	<i>Gala Dinner</i> (Granada V, Patio 2, the next to the garden on the Floor 0).	

* The must attend session.

**Day 3:
21 February 2025, Friday**

Time / Room	Room Andalusia IV (former Mirador de la Reina) (ARCI' 2025)	Room Andalusia II+III (former Mocarabes I+II) (DAUS' 2025)
8:45-9:15	Registration (8:45 to 13:00)	
9:15-9:30	* Daily Notifications (Prof., Dr. Sergey Y. Yurish, Chairman)	
9:30-10:00	Keynote presentation: The Use of Drones in Wildlife Ecology: Future Challenges and Opportunities (Mr. Rick Spaulding, Sr. Wildlife Biologist, ManTech Advanced Systems International, Bainbridge Island, WA, USA) (<i>Conference Room: Mocarabes I+II</i>)	
10:00-10:30	<i>Coffee Break</i>	
	<i>Parallel Sessions:</i>	
10:30-13:00	ARCI' 2025 Zoom Session	Special Session: Drone Applications for Wildlife Ecology
13:00-14:00		<i>Lunch on your own</i>
	<i>Parallel Sessions:</i>	
14:00-16:30	DAUS' 2025 Zoom Session	Regular Session: Networks, Communications and Drones Applications in Security & Surveillance
16:30-18:00	<i>Poster Session & Farewell Cocktail</i>	
18:00-18:30	* <i>Closing Session</i> (Prof., Dr. Sergey Y. Yurish, Chairman)	

* The must attend session.

The time in the table and in the technical programme above is the local time in Granada: GMT+1, Madrid.



ARCI' 2025

Technical Conference Programme

Day 1

19 February 2025, Wednesday

Regular Session: Automatic Control

Chairman: Prof., Dr. Takayoshi Yokota (Japan)

Tokyo Information Design Professional University, Japan

- 1. A Hardware-in-the-Loop System for Monitoring Building Energy Consumption with Sparse Sensors**
Daniel Jakob, Konstantin Wrede and Jan Bräunig (*Germany*)
- 2. Fuzzy H^∞ Robust Control and Neural Network-Based Delayed-Input Strategies for Uncertain Wind Energy Systems Using LMI Approach**
Kaoutar Lahmadi, Oumaima Lahmadi and Ismail Boumhidi (*Morocco*)
- 3. Development and Experimental Validation of a Dedicated Control Module Based on Current Compensation for Proportional Valves of Electro-Hydraulic System in TBMs**
Quan Huan, Guofang Gong, Yakun Zhang, Dong Han and Huayong Yang (*China*)
- 4. Convolutional Neural Network-based Sensor Data Analysis for Real-time Control of a Highly Dynamic Linear Motor**
Lars Zihlmann and Jürg P. Keller (*Switzerland*)
- 5. Optimal Trajectory Planning of Redundant Robotic Systems**
Yoram Halevi and Miri Weiss Cohen (Israel)

Regular Session: Robotics I

Chairman: Prof., Dr. Yoram Halevi
Technion- I.I.T and Shenkar College, Israel

- 1. Data-Driven Modeling for Privacy-Preserving Energy Prediction of Industrial Robots**
Philipp Steurer, Adam Skuta, Sebastian Hegenbart, Ralph Hoch and Thomas Lorünser (*Austria*)
- 2. Development of a Robot System as a Tool-carrier Machine for the Decontamination Process of Nuclear Power Plants**
Siavash Kazemi and Sascha Gentes (*Germany*)
- 3. Robotic Stretcher for Spinal Muscular Atrophy Patient: Trials on Controllability with Control Devices and Monitors by Users with Limited Operational Functions, and Applications to Elderly Support Equipment**
Taisuke Sakaki, Toshihiko Shimokawa, Yuko Kamiya and Takehiro Tashiro (*Japan*)
- 4. Off-Road Mobile Collaborative Robot for Healthcare**
Nina Valchkova and Roman Zahariev (*Bulgaria*)
- 5. Shortest time Route Control Method for MEC-cooperated Autonomous Mobile Robots**
Risa Takeuchi and Tutomu Murase (*Japan*)

Regular Session: Robotics II

Chairman: Prof., Dr. Taisuke Sakaki
Kyushu Sangyo University, Japan

- 1. Vehicle Localization Algorithm with Lane Discrimination Based on Inertial and Geomagnetic Sensor Data for GNSS-Denied Environments**
Takayoshi Yokota (*Japan*)
- 2. GPS Spoofing Attack Detection on Autonomous Vehicles Using Modified DBSCAN with Dynamic Threshold**
Ahmad Mohammadi, Vahid Hemmati, Reza Ahmari, Frederick Owusu-Ambrose, Mahmoud Nabil Mahmoud and Abdollah Homaifar (*USA*)
- 3. Analysis of a Multirotor with Eccentric Payload for Industry 4.0 Applications**
Sathish V, Srivasta Aluri and Janardhan Vistapalli (*India*)
- 4. Design and Modal Analysis of a Large Deployable Solar Sail System Based on Flasher Origami Structure and CFRP Boom**
Zijie Chen, Hongyi Xie, Fuqiang Duan, Wen Yao Zhang, Hongwei Guo, Penghao Chen and Franco Bernelli-Zazzera (*China, Italy*)

Day 2
20 February 2025, Thursday

Regular Session: Industry 4.0/5.0

Chairman: Prof., Dr. Bruno Agard
Polytechnique Montréal, Canada

- 1. On the Opportunities and Limitations of Artificial Intelligence and Machine Learning on Industry 4.0 and 5.0 Applications**
Marco Reis (*Portugal*)
- 2. Content-based Cognitive Ergonomics in Industry 5.0**
Pertti Saariluoma, Jose Cañas and Jaana Leikas (*Finland, Spain*)
- 3. Structured Use Case Development in Collaborative Industry 5.0 Research Projects**
Christian Jandl, Patrick Kramml, Nina Schulze, Thomas Holzmann, Christoph Ecker, Sebastian Schlund and Thomas Moser (*Austria*)
- 4. Proactive Asset Health Monitoring in Power & Utility: Leveraging AI, Robotics, and Advanced Surveillance for Predictive Maintenance and Failure Prevention**
Eyad Buhulaiga, Rana Al-Ghazi, Hesham Alghamdi and Abeer Alqahtani (*Saudi Arabia*)
- 5. Hybrid Ai-Assisted Approach for Unstructured Invoice Data Extraction to Improve Insertion Reliability in ERP Systems**
Luís Filipe Fernandes Vilas Boas, João Pedro Moreira Faria and António Herculano Jesus Moreira (*Portugal*)

Regular Session: Networks & Communications

Chairman: Prof., Dr. Pertti Saariluoma
Jyväskylä University, Finland

- 1. Enabling Secure Data Spaces: EDC, Pontus-X, and ADE**
Alfred Barnard and Cheng Xin (*Germany*)
- 2. Adoption of Post-Quantum Cryptography in Communication Technologies**
Vaghawan Prasad Ojha, Sumit Chauhan, Shantia Yarahmadhian and David Carvalho (*Nepal, India, USA, Portugal*)
- 3. Opportunistic Attacks in Secure Provisioning of IoT Smart Devices**
Sumesh Philip (*USA*)
- 4. Non Linear Equalization Techniques for High Speed Serial Links**
Paul Miqueu, Laurent Ros, Jean-Marc Brossier and Fabrice Belvèze (*France*)
- 5. Analysis of Rule-Based Models for Predicting Energy Consumption in Electric Bus Fleets: A Case Study with Telemetry Data**
Lucas Adam, Robert Pellerin and Bruno Agard (*Canada*)

Regular Session: Smart Manufacturing

Chairman: Dr. Sumesh Philip
Illinois State University, USA

- 1. Exploring the Effects of Different Instruction Methods on Assembly Task Efficiency and Behavior: A Preliminary Study**
Ricardo Rodrigues, Joaquin Dillen, Jaime Fonseca and Antonio Moreira
(*Portugal*)
- 2. Cyber-Physical Systems for Enhancing Precision and Efficiency in 3D Concrete Printing**
Mouad El Mesoudy, Rida Foulki and Driss Amegouz (*Morocco*)
- 3. ContentCreator: Automating AI Agent Workflows**
Salvatore Vella, Fatima Hussain, Salah Sharieh and Alex Ferworn
(*Canada*)
- 4. The Smart Suit: a Novel Tool Platform for Learning and Assessment at Work**
Sergio Leggieri, Pinar Sencandan, Vasco Fanti, Jamil Ahmad, Darwin G. Caldwell and Christian Di Natali (*Italy*)



DAUS' 2025

Day 1:
19 February 2025, Wednesday

**Regular Session:
Unmanned Aircraft Vehicles (UAV)
and Systems**

Chairman: Prof., Dr. Dylan Cawthorne
University of Southern, Denmark

- 1. Extending the Flight Endurance of UAVs by Using Photovoltaic Power Sources**
Wojciech Skarka (*Poland*)
- 2. Next-Generation Disaster Management Using Drones, AI, and Generative Models**
Muhammad Asif Khan, Najett Neji, Hedi Tabia and Hamid Menouar (*Qatar, France*)
- 3. Development of a Web-based UAV Flight Planner Using Geometric and Semantic Information with Embedded Drone Regulations**
Ahmed Alamouri, Cosima Berger and Konstantin Wenzlaff (*Germany*)
- 4. Maneuvering a Drone with Natural Human Movement**
Hironori Hiraishi (*Japan*)
- 5. Comparison of Vision Language Models with Traditional Discriminative Computer Vision Models for Drone Detection Tasks**
Enrique Puertas, Sergio Bemposta, Gerónimo Basso, Ana del Valle Corrales, Borja Monsalve and José Manuel López (*Spain*)
- 6. Temporary Aerial Networks: A Review of AI-Enabled UAV Swarms for Infrastructure Recovery**
Yuchen Qian, Roger Young and Sheila Fallon (*Ireland*)

**Regular Session:
Unmanned Underwater Vehicles (UUV),
Uncrewed Surface Vessels (USV) and Systems**

Chairman: Dr. Ing. Ahmed Alamouri
Technical University Braunschweig, Germany

- 1. Concept Design for a New Approach of a Subsurface Docking Station**
Sebastian Ritz, Job Pleger, Ines Cebulla and Erik Rentzow (*Germany*)
- 2. Design and Execution of a Remotely Operated Towed Vehicle**
Ines Cebulla, Maxim Root and Sebastian Ritz (*Germany*)
- 3. Analysis of the Accuracy of Hydrodynamic Damping Coefficients Used for the Maneuverability Prediction for a Subsurface Docking Station**
Barbara Blum-Thomas, Ines Cebulla and Sebastian Ritz (*Germany*)
- 4. Bio-inspired Structures to Improve Pressure Vessels for Underwater Applications**
Matthias Golz and Tobias van Dijk (*Germany*)
- 5. Water Quality Monitoring with Uncrewed Surface Vessels**
Paige McCraine (*USA*)

**Special Session:
Drones to Access Earth's Surface Processes
and Landforms**

Chairman: Prof., Dr. Jesús Rodrigo-Comino
University of Granada, Spain

1. The Use of UAVs in Viticulture to Assess Earth Surface Processes and Vegetation Changes

Laura Cambronero, Jesús González-Vivar, Sinan Demir, Francisco Serrano Bernardo, Jesús Fernández-Gálvez and Jesús Rodrigo-Comino (*Spain, Türkiye*)

2. Evaluating Different Geostatistical Techniques to Estimate Geomorphological Changes in Human-induced Gullies with UAVs and Remote Sensing

Jesús Rodrigo-Comino, María Teresa González-Moreno, Lucía Moreno-Cuenca, José Carvajal and José María Senciales (*Spain*)

3. CFD-Based Assessment of Wind Turbulence in UAV Photogrammetry and Terrain Surveying Applications

Enrique Aldao Pensado, Laura María Fernández Pardo, Gonzalo Veiga Piñeiro, Pablo Domínguez Estévez, Gabriel Fontenla Carrera, Fernando Veiga López, Elena Beatriz Martín Ortega and Higinio González Jorge (*Spain*)

4. Evaluation of Evaporitic Salt Pollutant Load in Acid Mine Drainage Conditions at Tharsis mine (Spain) Using a Hyperspectral UAS-Based Sensor

Raul Moreno Gonzalez, Melisa Isgró, Maria Dolores Basallote and Luis Barbero (*Spain*)

5. Mapping Intertidal Regions: Comparison of Fixed and Rotary-Wing UAV Operations and RGB Image Quality

Gabriel Fontenla Carrera, Enrique Aldao Pensado, Fernando Veiga López and Higinio González Jorge (*Spain*)

6. UAV Emergency Landing Area Judgement Framework Based on Satellite Imagery Obstacle Map

Hoseop Lee, Jeonghun Lee, Sungwook Cho and Yeondeuk Jung (*South Korea*)

Day 2:
20 February 2025, Thursday

**Regular Session:
Drones Applications in Industry, Military
and Agriculture**

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

- 1. Development of Drone-based Active Thermographic Inspection System**
Shashank Pant, Marc Genest, Dmitrii Klishch, Clemente Ibarra-Castanedo, Nicolas Avdelidis, Argyrios Zolotas and Xavier Maldague (*Canada, UK*)
- 2. Formation Guidance System for an Unmanned Combat Aerial Vehicle as a Wingman to an F-16**
Faisal Alhosani and James Whidborne (UAE, UK)
- 3. Drone Behaviors and Swarm Models for Swarming Applications in the Domain of Defense, Safety, and Security**
Hanno Hildmann (*The Netherlands*)
- 4. Investigating Spray Drift from Remotely Piloted Aerial Application Systems (RPAAS)**
John Church, Matthew Francis and Natasha Ramroop Singh (*Canada*)
- 5. Use of Drones to Autonomously Locate and Identify Range Cattle Outfitted with Virtual Fencing Collars**
John Church, Matthew Francis, Edward Bork, Carolyn Fitzsimmons, Alexandra Harland and Francisco De Novais (*Canada*)
- 6. Challenges in Flight Planning for Automatic Inspection of Olive Groves using UAVs**
Vladan Papić, Mirela Kundid Vasić and Toma Sikora (*Croatia, Bosnia and Herzegovina*)

Special Session: Innovative UAV System

Chairman: Prof., Dr. Younghoon Choi
Korea Aerospace University Geonggi-do, South Korea

- 1. Optimization of Flow Field Design for Improved Efficiency of PEMFCs in Aviation**
Juwon Jang and Seung-Gon Kim (*South Korea*)

- 2. Fusion Algorithm of A-star and Artificial Potential Field for Path Planning**
Jaewan Choi and Younghoon Choi (*South Korea*)

- 3. Space Oxide/Oxide Ceramic Composites with Atomic Oxygen Resistance for VLEO Stealthy Satellites**
Chae-Hwan Lim, Jae-Won Shim, Seong-Haeng Heo, Won-Ho Choi and Young-Woo Nam (*South Korea*)

- 4. Mid-Air Separation-Reintegration for Fixed-Wing UAV Systems**
Jun Hee Cho, Jong Bo Shin, Da Hwon Choi, Yeong Jun Lee and Jae Sung Bae (*South Korea*)

- 5. A* Algorithm-based UAV Path Planning and Obstacle Avoidance in a 3D Environment**
Byeong-Ju Kim, Yong-Duck Yoo, Sang-Hyeon Kim, Jung-Ho Moon and Su-Hwan Yun (*South Korea*)

- 6. Slicing Aided Hyper Inference (SAHI)-based Unstructured Re-slicing Algorithm for Enhancing Performance of Small Object Recognition**
Jinyoung Lee, Jeonghun Lee and Sungwook Cho (*South Korea*)

Special Student Session: UAS

Chairman: Prof., Dr. Jae-Sung Bae
Korea Aerospace University Geonggi-do, South Korea

- 1. Resource Management and Scheduling of a Regional Defense System for UAV Countermeasures**
Cha Younghyeon and Jang Daesung (*South Korea*)
- 2. Design and Flight Test of Ducted Fan Electric Vertical Take-off and Landing Based on Blended Wing Body UAV**
Eun Gyeol Ha, Jun Seok Park, Bong Do Pyeon and Jae Sung Bae (*South Korea*)
- 3. Development of Capture Anti-Drone Systems using Particle Filter based Object Tracking Algorithm**
Minseong Ryu, Huiyang Kim and Younghoon Choi (*South Korea*)
- 4. Voltage Characteristics of Dead-End PEMFC for Military Drones**
Jaehyung Choi and Seung-Gon Kim (*South Korea*)
- 5. Asynchronous Federated Learning for Remote Sensing Drone Network Using Satellite IOT**
Taekhyun Kim, Changmin Lee and Zizung Yoon (*South Korea, Germany*)
- 6. 3D Printed Wing-shaped Composite Patch with Electrothermal Self-heating Superhydrophobic Element for Unmanned Aircraft Vehicles**
Hanjun Seo, Jungsun Park and Youngwoo Nam (*South Korea*)

Day 3:
21 February 2025, Friday

**Special Session:
Drone Applications for Wildlife Ecology**

Chairmen:

Mr. Rick Spaulding

(ManTech Advanced Systems International, USA)

Dr. Dr. David M. Bird

(McGill University, Montreal, Quebec, Canada)

- 1. A Short History of the Use of Drones for Wildlife Research and Conservation**
David Bird *(Canada)*
- 2. Evaluating the Use of Drones for Wildlife Studies: Opportunities and Challenges**
Fred Tremblay and Kyle Elliott *(Canada)*
- 3. Uncrewed Aerial Vehicles: Taking Cetacean Research to New Heights**
Gina Lonati, John Durban, Don LeRoi, Michael Moore and Kimberley Davies *(Canada, USA)*
- 4. Animal Classification and Detection via Hyperspectral Imagery and Uncrewed Aerial Systems**
Daniel McCraine, Sathishkumar Samiappan, Leon Kohler, Timo Sullivan and David Will *(USA)*
- 5. Drone Data Management, Processing and Analysis: Best Practices with Examples from California and Costa Rica**
Sean Hogan *(USA)*
- 6. Monitoring Large Non-breeding Aggregations: Using Drones to Enhance Avian Research in Dense and Urban Environments**
Craig Gibson *(USA)*
- 7. Designing Drones for Wildlife Radio Telemetry**
Michael Shafer *(USA)*

**Regular Session:
Networks, Communications and Drone Application
in Security & Surveillance**

Chairmen:

Dr. Jan Bauer

Fraunhofer FKIE, Germany

Dr. Hanno Hildmann

The Hague University of Applied Sciences, The Netherlands

- 1. U-space TWICS: A Meta U-space Service Concept to Aid Developing Communications Between Autonomous Uncrewed Systems**
Fabian Krause (*Germany*)
- 2. Investigating the Impact of Communication Delays and Bandwidth Restrictions on Remote Operations of Unmanned Systems**
Jan Bauer, Alexander Klein, Bertram Schütz and Jannis Stoppe (*Germany*)
- 3. The Impact of Blur on Remote Sensing Aspects of Environmental Monitoring Using Unmanned Ground Vehicles**
Bas van Driel, Hanno Hildmann, Amey Vasulkar, Bart Louwes, Fernando Garcia Fernandez and John Bolte (*The Netherlands, Spain*)
- 4. Multi-Modal Image Matching for GNSS-Denied UAV Localization**
Ahmedelbadawi Hussien Hassan, Marcin Żugaj (*Poland*)
- 5. An AI-assisted Multi-drone Architecture for Surveillance Operations**
David Carramiñana, Lucas Rey, Raul Arranz, Juan A. Besada and Ana M. Bernardos (*Spain*)
- 6. Potential Analysis of Software Obfuscation to Protect Unmanned Systems Against Forensic Analysis**
Niklas Bergmann, Elmar Padilla and Jan Bauer (*Germany*)

7. The Use of Unmanned Platforms in Image Reconnaissance

Karolina Skowrońska, Zuzanna Borkowska and Wojciech Stecz
(*Poland*)

**8. Drone Infrastructures Planning on Large-Scale
for Passenger Transport**

Stefano Cunietti, Chiara Sammarco, Ilaria Ferrando, Juan Vicente
Balbastre Tejedor and Domenico Sguerso (*Italy*)

Poster Session
ARCI' 2025 & DAUS' 2025:

- 1. Enhancing Efficiency and Performance: Robotic Applications in Skiing**
Răzvan Gabriel Boboc (Romania)
- 2. Development of a Robot System for Cooperative Production with a 3 Axis Machine Tool**
Andre Sewohl, Armin Schleinitz, Chris Schöberlein, Holger Schlegel and Martin Dix (Germany)
- 3. Identification and Correction of Periodic Fluctuations In the Motor Torque Signal of Electromechanical Axes**
Chris Schöberlein, Armin Schleinitz, Holger Schlegel and Martin Dix (Germany)
- 4. Improve the Reliability of Data Collected from IoT Devices by Allowing Redundancy of Data Transmissions in LPWAN**
So-Yeon Lee and Dae-Young Kim (South Korea)
- 5. Seamless Integration of 3D LiDAR into ROS-based 2D Navigation Systems**
Jonghyun Park, Yongmin Ju, Wonil Choi, Hong Kook Kim and Moongu Jeon (South Korea)
- 6. Vision-based Real-time Leak Localization System Based on Infrared Thermography for Leakage Testing**
Angela Semitela, João Silva, André F. Girão, Nuno Lau, José P. Santos and Antonio Completo (Portugal)
- 7. A Decentralized Identity Authentication Framework for Enhancing Security in Smart Factories Using IOTA Tangle**
Chun-Mao Lin, luon-Chang Lin and Pai-Ching Tseng (Taiwan)
- 8. A Study on Automatic Labeling Technology for Drone Parts Recognition**
Sang-Hyeon Kim, Yunuk Han, Byeongju Kim and Gaeun Yun (South Korea)

- 9. Handling Uncertainty in UAV Sensor Information Using Bayesian Belief Network and Large Language Model**
Sagir Muhammad Yusuf, Chris Baber and Eyal Ofek (*UK*)
- 10. Precise Autonomous UAV Landing in a Specialized Backpack of a Moving Bus**
Julian Rothe, Michael Strohmeier, Alexander Hilgarth and Sergio Montenegro (*Germany*)
- 11. Large Language Models to Enhance Multi-Task Drone Operations in Simulated Environments**
Yizhan Feng, Hichem Snoussi, Jing Teng, Abel Cherouat and Tian Wang (*France, China*)
- 12. A Lightweight, Low-Power and Versatile Companion Computer for Nano UAVs**
Rintaro Okudera, Yixiao Li, Yutaka Matsubara and Hiroaki Takada (*Japan*)
- 13. Development of Disaster Factor Monitoring and Risk Warning Technology for Railway Protection Zones Based on Digital Sensing Twins**
Minkyong Kim (*South Korea*)
- 14. Towards Efficient UAV Swarm Control for Photogrammetry: Evaluating a Reinforcement Learning Approach**
Karol Piotr Bęben, Robert Głębocki and Mariusz Kacprzak (*Poland*)
- 15. Development of Prototype of Indoor Drone for Emergency Response for Fire in Futuristic Complex Transfer Center**
Su-Hwan Yun, Won-Hee Park, Duckhee Lee, Tae-Soon Kwon and Chan-Woo Lee (*South Korea*)

Virtual Session in Zoom (live streams)

Chairman: Prof. Dr. Sergey Y. Yurish

International Frequency Sensors Association (IFSA), *Spain*

- 1. Road Patrol with Traveling Salesman Formulation**
Teewenbé Boris Kiema, Hélène Piet-Lahanier, Najett Neji
and Samia Bouchafa (*France*)
- 2. AI-Enhanced Drone Surveillance for Suspicious Behavior Detection in Public Spaces**
Yuina Kondo and Pann Yu Mon (*Japan*)
- 3. A Novel Modification to Classical Controllers that Reduces System Deviation Due to System Inconsistencies**
Fangyuan Li (*China*)
- 4. Quantum and Plasma-Free Laser Lithography for Chip Manufacturing**
Ryan Nadar (*India*)
- 5. Advanced Fibers for Next-Generation Drone: A Paradigm Shift**
Ryan Nadar (*India*)
- 6. OPTmicro Dataset: Open Training Data for Autonomous Microvehicles**
Mahmoud Laghbani, Dimitar Iliev, Karsten Schwalbe, Robert Konradt
and Stephan Schmidt (*Germany*)
- 7. Recommendations for Gaining Knowledge, Making Decisions and Overcoming Key Barriers in the Context of Industry 4.0 and Industry 5.0**
Sebastian Trojahn, Norge I. Coello Machado and Elke Glistau
(*Germany, Cuba*)
- 8. Digital Pipeline Linking Material, Engineering and Manufacturing Data**
Marcos Morandeira, Antonio Abadía, Davinia Fernández and Lucía Alonso Ferreira (*Spain*)

- 9. Prediction of Residual Stress Components in Wires Using an Artificial Neural Network**
Dmitriy Demin, Ilya Grebenkin and Alexey Barinov (*Russia*)
- 10. Heterogeneous Multi-Robotic System for Complex Task Execution**
Chairi Kiourt, Altzi Tsanko, Konstantinos Tziridis, George Simeonidis, Anestis Koutsoudis and George Ioannakis (*Greece*)
- 11. Guidance System Design for a Weeding Robot**
Najia Ait Hammou, Hajar Mousannif and Brahim Lakssir (*Morocco*)
- 12. Experimental Investigation of Rotor Interactions: Effects of Overlap, Proximity, and Rotational Speed on Thrust Generation**
Concepción Paz, Eduardo Suarez, Christian Gil, Jesús Vence and Miguel Concheiro (*Spain*)
- 13. UAV-Based TVDI for Surface Soil Moisture Estimation in Coastal Wetlands of Estonia**
Ricardo Martinez, Miguel Villoslada, Raymond D. Ward and Kalev Sepp (*Estonia, Finland, UK*)
- 14. Framework for Integrating Robotics with AI, Quantum Computing, and 6G Mobile Networks**
Javaid Iqbal Zahid, Alex Ferworn and Fatima Hussain (*Canada*)

Pre-Recorded Video Presentations

- **Papers 1- 12:**
https://arci-conference.com/arci_2025_video_presentations.html
 - **Papers 13-20:**
https://daus-conference.com/daus_2025_video_presentations.html
- 1. Digital Transition on the Factory Floor: An interoperable Application for Web Forms Management**
José Cosme, Anabela Ribeiro, Eurico Amorim and Vítor Filipe
(*Portugal*)
 - 2. Enhancing Energy Efficiency Prediction in Assisted Living Through GA-FIS, PSO-FIS, and NGSa-II-FIS: A Comparative Evaluation**
Anita Xhemali, Elma Zanaj, Gledis Basha and Lorena Balliu (*Albania*)
 - 3. A Data-Driven Approach for UAV-UGV Integration**
Reza Ahmari, Vahid Hemmati, Ahmad Mohammadi, Parham Kebria, Mahmoud Nabil Mahmoud and Abdollah Homaifar (*USA*)
 - 4. Evaluating Trojan Attack Vulnerabilities in Autonomous Landing Systems for Urban Air Mobility**
Reza Ahmari, Vahid Hemmati, Ahmad Mohammadi, Mohammed Mynuddin, Parham Kebria, Mahmoud Nabil Mahmoud and Abdollah Homaifar (*USA*)
 - 5. Enhancing Robustness of Image Measurement Method for Navigating an AGF to a Pallet for Real Site Use**
Nobuyuki Kita and Takuro Kato (*Japan*)
 - 6. Fuzzy Equivalence Relation Clustering Framework for Distributed Denial of Service Detection Accuracy Estimation**
Frederick Owusu-Ambrose, Abdul-Rauf Nuhu, Benjamin Lartey, Ahmad Mohammadi and Abdollah Homaifar (*USA*)
 - 7. Digital Twin of Full-automated Warehouse with Deep Storage Racks**
Kirill Pankratov, Hleb Kruchkou, Aliaksandr Samakhvalau, Shamil Gadzhimirzaev, Ruslan Pashkov, Daniil Razhkov and Aleksandr Khelvas (*Russia, Belarus*)

- 8. Enhanced Warehouse Automation: Using LLMs, Computer Vision, and Conveyor Belts for Products Registration and Counterfeit Detection**
André Felipe dos Santos Caraíba, Victor Emanuel da Silva Monteiro, Cléber Daniel Werlang, Anselmo Rafael Cukla, Daniel Fernando Tello Gamarra, Lucas Strapazzon, Solon Bevilacqua, Claudenir Rocha Alves Filho, André Palharini Nascimento dos Santos and Rafael Crespo Izquierdo (*Brazil*)
- 9. Computer-Mediated Intimacy and Socialification of Familyship**
Hiroshi Yamaguchi (*Japan*)
- 10. Digital Transformation in Industrial Contexts: How AGVs and Cobots are Transforming Workplaces Amid Safety Challenges**
Mohamed Naceur Ben Aziza, Adel Badri and Hajer Jemai (*Canada*)
- 11. Efficient Dual Processing Pathways Architecture for Multimodal Sensor Data Fusion**
Unse Fatima, Zafran Khan, Junbom Pyo, Sojin Kim and Moongu Jeon (*South Korea*)
- 12. Determination of Fluid Velocity in Microfluidic Devices with Variable Channel Widths by Rectangular Patterns Using SLA (Additive Manufacture)**
Gary Felicita, Victor H. Cabrera-Moreta and Luis Juiña (*Ecuador*)
- 13. Low Latency Communication in U-Space System: Comparative Analysis of Push-Pull and Publisher-Subscriber Protocols**
Neno Ruseno, Fabio Suim Chagas, Miguel-Ángel Fas-Millán and Aurilla Aurelie Arntzen Bechina (*Germany, Norway*)
- 14. Parking Space Detection Using a Reinforcement Learning-based Unmanned Aerial Vehicle in a Virtual Environment**
Akhil Giddaluri, Alex Jiang, Nikhil Giddaluri, Audrey Liang, Thomas Li, Dalei Wu and Yu Liang (*USA*)
- 15. Pilot Initiated Recovery System for Unmanned Jet Aircraft**
Halil Ibrahim Erbas, Melih Korkmaz, Fikret Caliskan and Resit Demirkiran (*Turkey*)

16. Optimal Recombination of Air Transport Technologies on Condition of the Decision-Making Person's Uncertainty: Simplest Calculus of Variations Problem

Andriy Goncharenko and Viktor Iliushyn (*Ukraine*)

17. Efficient Drone Path Planning through Strategic Launch Pad Positioning

Gregory Gasteratos and Ioannis Karydis (*Greece*)

18. A Novel Collaborative UAV Navigation Algorithm for Multi-Agent Scenarios

Kenan Can Taşan and Ahmet Akbulut (*Turkey*)

19. Drones as Innovative Empowerment of Disaster Management - Case Study from the Flood in the Odra River Basin, Poland (2024)

Radoslaw Fellner, Andrzej Fellner and Adrian Drzycimski (*Poland*)

20. A Tilting-Rotor Enhanced Quadcopter Fault-Tolerant Control Based on Non-Linear Model Predictive Control

Yanchao Wang, Xu You and Mehdi Baghdadi (*UK, China*)

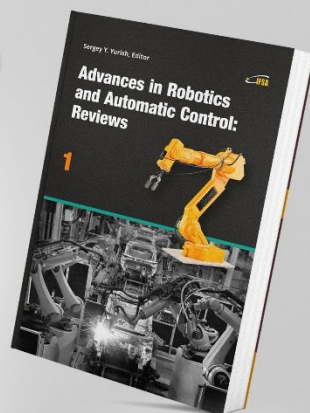
Advances in Robotics and Automatic Control: Reviews

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.



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