



17th APCA International Conference on Automatic Control and Soft Computing (CONTROLLO 2026)

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<https://controllo2026.apca.pt/>

Special Session on “Artificial Intelligence and Machine Learning for Modeling, Optimization and Control of Complex Systems”

Organised by

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Call for Papers

Description:

The increasing complexity of modern systems, together with growing demands for efficiency, sustainability, and autonomy, is driving the integration of Artificial Intelligence into automatic control and decision-making processes. Traditional modelling and control strategies are often insufficient to deal with highly nonlinear and uncertain such as cyber-physical systems, smart infrastructures, and autonomous platforms.

This Special Session aims to provide a forum for researchers to present recent advances in AI-driven modeling, optimization, and control of complex systems. Emphasis is placed on the integration of machine learning with control theory, enabling adaptive, and intelligent control strategies capable of improving performance, robustness, and autonomy.



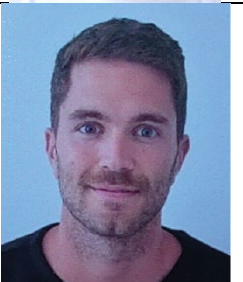

The session welcomes contributions addressing both theoretical developments and real-world applications, including control based on learning, modeling based on data, intelligent optimization methods, as well as fault diagnosis enhanced by AI. Applications may cover industrial systems, energy systems, smart buildings, transportation, robotics, and other cyber-physical environments.

By bringing expert knowledge in control engineering, artificial intelligence, and data science together, this special session aims to promote interdisciplinary research and highlight emerging methodologies that will shape the next generation of intelligent control systems.

Topics of interest include (but are not limited to):

- Machine learning techniques for modeling dynamical systems
- Control strategies based on learning and data.
- AI methods for optimization in control systems
- Intelligent control and computational intelligence approaches
- Reinforcement learning for autonomous and adaptive control
- Fault detection, diagnosis, and predictive maintenance using AI
- Systems identification and modelling based on data.
- AI for cyber-physical systems and smart infrastructures
- Industrial applications of AI in control and automation

Short CV of Each Organizer

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| <p>Prof. Francisco Zayas-Gato obtained the B.S. degree in Industrial Electronics and Automation Engineering, the M.S. degree in Efficiency and Energy Utilization and the Ph.D. degree in Energy and Marine Propulsion from the University of A Coruña (Spain). In 2020, he joined the University of A Coruña as Professor of Power Electronics and Automation at the Polytechnic School of Engineering. His main research interests are focused on the application of intelligent techniques for prediction and anomaly detection in industrial systems. Regarding his research activity, it is worth highlighting the publication of 16 articles in JCR-indexed journals.</p> |  |
| <p>Álvaro Michelena received a M.S. in Industrial Computing and Robotics from the University of A Coruña in 2021. After four years working in different research projects, in 2025 he received his Ph.D. in Computational Science at the University of A Coruña, Spain. He is Assistant Professor at the Faculty of Engineering, University of A Coruña, Spain. His main research areas are related to the development of intelligent and innovative solutions based on artificial intelligence for anomaly detection and system modeling in diverse fields.</p> |  |
| <p>Esteban Jove received a M.S. degree in Industrial Engineering from the University of Leon in 2014. After two years working in the automotive industry, he joined the University of A Coruña, Spain, where he has been Assistant Professor of Power Electronics in the Faculty of Engineering since 2016. He received his Ph.D at the University of La Laguna in 2020, and his research has been focused on the use of intelligent techniques for nonlinear systems modelling and anomaly detection using one-class techniques.</p> |  |
| <p>José Luis Calvo-Rolle received the BS in Industrial Engineering from the University of A Coruña, the MS and PhD degrees in Industrial Engineering from the University of Leon, Leon, Spain, in 1998, 2004 and 2007, respectively. He is full professor of Automatic Control and the coordinator of Cybernetics Science and Technique Research Group, Faculty of Engineering, University of A Coruña, Spain. His main research areas are related to optimization, modelling, anomaly detection, instrumentation and control applied to multiple types of systems.</p> |  |

Additional information

Please write here any other relevant details not covered in the previous fields (optional).