

ICIT 2023

The 24th IEEE International Conference on
Industrial Technology
Orlando FL, USA | 4 - 6 April, 2023



ICIT 2023 Special Session Proposal

Title of the Proposal:

Distributed machine learning systems in industrial IoT and robotized environments

Technical Outline of the Session and Topics:

Outline of the Session:

Next generation industry, driven by novel communication technologies, will rely on networked machines with increasing level of intelligence and autonomy. New research opportunities will target the integration of distributed learning tools with sensing, communication, and machine-level decision operations. Distributed techniques, namely decentralized, federated or split learning, are becoming crucial to enable challenging tasks in several robotized environments, improving safety, trustworthiness, data-ownership, reliability, scalability, and latency.

This Special Session aims to put together original research papers on advanced algorithms for distributed learning in robotized environments, based on dense wireless networks and industrial IoT methods (localization, perception, motion tracking), and performance optimization.

Topics of the Session:

- *Federated machine learning and reinforcement learning methods in robotized environments and automated buildings*
- *Distributed signal processing and learning for automated guided vehicles and industrial IoT networks*

- *Human-machine shared workspaces and cobots optimization*
- *Free-space user interfaces for human-machine interaction (hald and full body gesture and activity recognition) in workspaces*
- *Device-free localization and operator motion tracking for building automation and control*
- *Advanced distributed radio sensing, radio tomography and holography methods in robotized environments*

IEEE IES Technical Committee Sponsoring the Special Session (if any):

Building Automation Control and Management (BACM)

Short bio and contact details of the Session Organizers

- *Stefano Savazzi: (contact: stefano.savazzi@ieiit.cnr.it) joined the Consiglio Nazionale delle Ricerche (CNR), Institute of Electronics, Computer and Telecommunication Engineering (IEIT) in 2012. He has co-authored over 120 scientific publications, currently serving as principal investigator for the Horizon EU projects Holden and Trustroke. His research interests include distributed signal processing, federated and distributed machine learning, green networking aspects for the industrial Internet of Things, including radio localization, RF holography and vision technologies.*
- *Nicola Pedrocchi: (contact: nicola.pedrocchi@stiima.cnr.it) joined the Consiglio Nazionale delle Ricerche (CNR) in 2011 as Researcher, and he has been Senior Researcher since 2021. His research interests include control techniques for industrial manipulators in advanced applications requiring the interaction robot-environment or robot-human operator. Since 2015, he has been coordinating the activity of the Robot Motion Control and Robotized Processes Laboratory of CNR-STIIMA.*
- *Sanaz Kianoush: (contact: sanaz.kianoush@ieiit.cnr.it) joined the Consiglio Nazionale delle Ricerche (CNR) of Italy, Institute of Electronics, Computer and Telecommunication Engineering (IEIT) in 2014. Her research interests include statistical signal processing, sensor fusion in communication systems using machine learning and federated learning, design algorithms for device free radio-based localization and human activity recognition.*
- *Kim Fung Tsang: (contact: kftsang@ieee.org) is a faculty in the Department of Electrical Engineering, City University of Hong Kong. His speciality is in IoT, AI, wireless communication. KF has published more than 300 technical papers, a few patents, and four books/book chapter.*
- *Mahmoud (Moe) Alahmad, (contact: malahmad2@unl.edu) is a faculty in the Department of Electrical Engineering at University of Nebraska-Lincoln. His speciality is in power and energy. He has published over 250 technical papers.*