INDIN 2023 Special Session on

SS 10 – Engineering of AI-Based Systems in Industrial Automation

organized by

Principal Organizer: Julius Pfrommer (julius.pfrommer@iosb.fraunhofer.de)
Fraunhofer IOSB, Germany and Karlsruhe Institute of Technology, Germany

Dr.-Ing. Julius Pfrommer is head of the department "Cognitive Industrial Systems" at Fraunhofer IOSB and holds engineering degrees in industrial engineering (Karlsruhe Institute of Technology and Institut Polytechnique de Grenoble), as well as a PhD in computer science from Karlsruhe Institute of Technology. His dissertation on distributed planning for factory automation was awarded the ICT dissertation award. He is furthermore the scientific head of the Competence Center for KI-Engineering (CC-KING) that focuses on the emergence of AI Systems Engineering as a professional discipline. Julius Pfrommer is a lecturer at KIT for his master-level course on convex optimization with applications in machine learning and engineering. His research interests include the conjunction of artificial engineering with engineering and the natural sciences, adaptive production systems, planning under uncertainty, and optimization theory with its many applications for machine learning and control.

Organizer 1: Thomas Usländer (thomas.uslaender@iosb.fraunhofer.de)
Fraunhofer IOSB, Germany

Dr.-Ing. Thomas Usländer holds a degree in Computer Science and a PhD in Engineering of the Karlsruhe Institute of Technology (KIT), Germany. He is head of the department "Information Management and Production Control" and spokesperson of the business unit "Automation and Digitalization" at Fraunhofer IOSB. He was an invited expert of the European Commission about geo-spatial information systems, got the DIN Innovation Award 2017 about Industrie 4.0 and the OMG Application Award 2000. He is member of various working groups of the Platform Industrie 4.0, the expert panel of the Standardization Council Industrie 4.0 (SCI4.0) and the DIN/DKE high-level Coordination Group "AI standardization and conformity". He is co-chair of the Industrial Community IDS-I of the International Data Spaces Association and chair of the Competence Center Karlsruhe on AI Systems Engineering (CC-KING). His research interests include agile system and service engineering, AI systems engineering as well as open architectures for the Industrial Internet of Things.

Organizer 2: Jürgen Beyerer (juergen.beyerer@iosb.fraunhofer.de)
Fraunhofer IOSB, Germany and Karlsruhe Institute of Technology, Germany

Prof. Dr.-Ing. habil. Jürgen Beyerer is full professor for informatics at the Institute for Anthropomatics and Robotics at the Karlsruhe Institute of Technology KIT since March 2004 and director of the Fraunhofer Institute of Optronics, System Technologies and Image Exploitation IOSB in Ettlingen, Karlsruhe, Ilmenau and Lemgo. Research interests include automated visual inspection, optimal acquisition of image data, signal and image processing, statistical signal theory, active vision, metrology, information theory, fusion of data and information from heterogeneous sources, system theory, autonomous systems and automation.

Call for Papers

This Special Session has its focus on methods and tools for the development and operation of AI-based solutions in industrial automation. Hence this Session invites contributions not only on AI methods themselves, but also on their integration in a Systems Engineering context. There are many prominent examples for Artificial Intelligence and Machine Learning in Factory Automation. But only a fraction of the successful prototypes becomes established into long-term use. The community for "AI Systems Engineering" develops methods and tools to professionalize the use of AI methods in an engineering context. The target audience include systems and application engineers, computer scientists, AI experts and operators of AI-based solutions.

Topics of interest include, but are not limited to:

- Methods and tools for the systematic development of AI-based solutions in industrial automation and Systems Engineering contexts
    - Performance estimation for AI components during the systems design phase
    - Integration of prior engineering knowledge with data-driven methods
    - Achieving trustworthiness and explainability of AI in critical systems
    - …
- Methods and tools for the (long-term) operation of AI-based solutions in industrial automation
    - Runtime supervision of AI-based solutions
    - Robust AI with respect to drifts and distributional shifts
    - Human-machine interfaces
    - …
- Standardization efforts for the use of AI in engineering environments
- Response to regulatory and legal frameworks of AI-based systems (such as the European AI Act)
- Cross-company Data Spaces and their use in AI

Submissions Procedure: All the instructions for paper submission are included in the conference website https://2023.ieee-indin.org/index.php

Deadlines:

Deadline for submission of papers:	**March 01, 2023**
Notification of acceptance of papers:	**April 15, 2023**
Final manuscripts due:	**June 05, 2023**