22nd IEEE International Conference on Factory Communication Systems

SPECIAL SESSION SS6 – Joint Communication and Sensing (JCAS) in Industrial IoT

ORGANIZED BY:

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DESCRIPTION

Smart factories under Industry 4.0 and Industry 5.0 demand intelligent wireless communication systems that are, highly reliable, low-latency, context-aware, and adaptive. Joint Communication and Sensing (JCAS) offers a promising paradigm for such next-generation industrial environments, where communication networks combine data transmission with environmental sensing capabilities. In smart factories, this dual role reduces infrastructure overhead while opening up new opportunities across production, maintenance, and safety. JCAS is particularly relevant for 5G, 6G, and complementary networking technologies including Wi-Fi, Bluetooth, and mmWave massive MIMO.

JCAS is gaining attention from both academy and industry in many domains, from health care to infrastructure monitoring. This session explores real-world applications by integrating sensing and communication, as JCAS can enhance predictive maintenance, improve worker safety, enable real-time monitoring of assets, and optimize network performance in smart factories. Applications range from detecting human presence in restricted zones to optimising routing in dense wireless networks and supporting autonomous systems in harsh environments.

Given the increasing interest and ongoing challenges in the industrial adoption of JCAS, the main aim of this special session is to bring together researchers and practitioners to discuss JCAS challenges and opportunities in IIoT, bridging theory and practice for future industrial ecosystems.

FOCUS

The Special Session focuses on (but is not limited to):

- JCAS architectures and frameworks for industrial environments
- JCAS integration in 5G/6G factory networks
- mmWave (and beyond) JCAS solutions for factory environments
- Wi-Fi and Bluetooth-based sensing for industrial safety
- Predictive maintenance using JCAS-enabled sensing
- Human detection, intrusion monitoring, and asset tracking using JCAS
- JCAS-driven network optimization: routing, resources, and scheduling
- AI/ML-driven signal processing for JCAS
- Transfer/continual learning for cross-domain JCAS
- Security and privacy challenges in JCAS-enabled IIoT systems
- Energy-efficient JCAS-enabled networks
- Interference mitigation / co-existence strategies
- JCAS-based Beamforming
- Reconfigurable Intelligent Surface (RIS)-assisted JCAS

PAPER SUBMISSION: Instructions for paper submission are included in the conference website: https://hs-offenburg.de/wfcs26

IMPORTANT DATES

Regular/SS submissions:

Hard Deadline: **February 1**, 2026
Notifications: **February 27**, 2026
Final versions: **March 6**, 2026

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