CALL FOR PAPERS - SPECIAL SESSION
"Embodied Intelligence for Sustainable Manufacturing Systems"
for CODIT 2026
July 13-16, 2026 ▪ Bari, Italy

Session Co-Chairs:

- Prof. Carmen DEL VECCHIO, Department of Engineering (DiING) - Università degli Studi del Sannio – Benevento- Italy (email: delvec@unisannio.it)
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Session description:

The transition toward Industry 5.0 paradigms demands a fundamental shift from purely automated production systems to human-centric, sustainable, and resilient manufacturing environments. Current manufacturing systems is facing with: *(i)* sustainability imperative demanding resource optimization and circular economy principles; *(ii)* technological advancement enabling autonomous and decision-making and intelligent capabilities; *(iii)* social need for safe, inclusive, and intuitive human work. Traditional approaches treat these dimensions separately, leading to suboptimal configurations/solutions. Embodied intelligence offers a unifying framework where sensing, reasoning, and actuation are seamlessly integrated across the cyber-physical-human continuum, enabling systems where intelligence is not merely centralized in computational units but is embodied, as unique system, in physical interactions, distributed across networked entities, and emerges from human-machine collaboration.

This special session addresses the critical challenge of integrating embodied intelligence—where cognitive capabilities are distributed across physical systems, digital infrastructures, and human operators—to create adaptive, sustainable, and inclusive manufacturing ecosystems. The session focuses specifically on systems that demonstrate how embodied intelligence enables manufacturing to be simultaneously autonomous yet adaptive, efficient yet sustainable, and technologically advanced yet human-centric. We seek contributions that establish scientific foundations for designing and implementing such systems, moving beyond ad-hoc implementations toward systematic approaches that achieve measurable improvements across sustainability metrics, operational performance, and human factors while maintaining verifiable performance guarantees in real manufacturing environments.

The primary goal of this special session is to establish a scientific foundation for designing and implementing embodied intelligent systems in manufacturing that achieve measurable improvements across multiple dimensions. We aim to bring together contributions that demonstrate how embodied intelligence can simultaneously enhance sustainability metrics such as energy efficiency, material utilization, and lifecycle extension, while improving operational performance including quality, throughput, and flexibility, and addressing human factors encompassing safety, ergonomics, cognitive load, and inclusivity. We aim at outlining a discussion line for integration of cognitive technologies and human centric automation in industry5.0

We expect contributions that formalize design methodologies for embodied intelligence architectures within manufacturing contexts, moving beyond ad-hoc implementations toward systematic approaches grounded in theoretical principles. The session seeks to identify and advance evaluation frameworks that balance technical performance with sustainability and human-centric criteria, recognizing that optimization of a single dimensi on often leads to suboptimal overall system performance. Furthermore, we are interested in integration strategies for heterogeneous intelligent entities, including robots, digital twins, AI agents, and human operators, that enable seamless coordination and collective intelligence emergence.

The topics of interest include, but are not limited to:

- Embodied Intelligence for smart production
- Intelligent Robots for autonomous assembly/disassembly
- Human-Machine Embodiment
- Digital Twin Technology for proactive performances
- Bi-Directional Human Robot Collaboration for adaptive systems
- Product reconfigurability for closed paths
- Intelligent Learning paths for quality assessment and maintenance actions
- Cognitive Modelling for safety systems
- Diversity Integration for inclusive workspaces

SUBMISSION

Papers must be submitted electronically for peer review through PaperCept by **February 07, 2026:**
http://controls.papercept.net/conferences/scripts/start.pl . In PaperCept, click on the **CoDIT 2026 link "Submit a Contribution to CoDIT 2026" and follow the steps.**

IMPORTANT: All papers must be written in English and should describe original work. The length of the paper is limited to a maximum of 6 pages (in the standard IEEE conference double column format).

DEADLINES

February 07, 2026: deadline for paper submission
April 30, 2026: notification of acceptance/reject
May 20, 2026: deadline for final paper and registration