

Human-Robot Collaboration for Futuristic Human-Centric Smart Manufacturing

Goal:

In line with the human-centric smart manufacturing, modern factories are striving for an ever-higher degree of flexible and resilient production, as conventional automation approach has reached its bottleneck considering mass personalization with increasing complicatedness and complexity. To achieve it, human-robot collaboration (HRC) becomes a prevailing strategy, which combines high accuracy, strength, and repeatability of industrial robots with high flexibility and adaptability of human operators to realise optimal overall productivity. Cutting-edge technologies, including robot learning and control, cognitive computing, mixed reality/metaverse, industrial IoT, and advanced data analytics create the potentials to bridge the gap of knowledge distilling and information sharing between onsite operators, robots and the manufacturing system. Therefore, this special session aims to bring together specialists in different fields of manufacturing systems, robotics, artificial intelligence, and other engineering domains to address the foreseeable HRC-empowered human-centric smart manufacturing paradigm characterized with high-level teamwork skills.

Track topics and their description

This special session aims to present the state-of-the-art, informatics-based approaches, tools, systems, and cases to enable the readiness and realization of HRC for futuristic human-centric smart manufacturing. To contribute to those areas, this special session includes the following topics, but are not limited to:

- Human-robot collaborative dis-/assembly
- Predictable human-robot-task execution loop
- Cognitive human-robot collaboration systems
- MR/Metaverse-assisted human-robot collaboration
- Self-organizing multiple human-robot collaboration
- Intuitive safety concerns in human-robot collaboration
- Multi-modal Intelligence for human-robot collaboration
- Adaptive motion planning in human-robot collaboration
- Human intention prediction in human-robot collaboration
- Semantic knowledge representation for human-robot collaboration
- Human-robot collaboration cases, systems, and implementations in manufacturing

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