Advancing Human-System Integration within Industrial Ecosystems

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Short presentation:

In alignment with the theme for the SOHOMA 2025 workshop – "Collaborative and autonomous manufacturing ecosystems for the industry of the future" – this special session aims to explore the tasks, roles and interactions of humans within this emerging context. This session will aim to explore and discuss the opportunities and challenges for industry to advance from *human-system interaction* towards *human-system collaboration*, and from isolated one-to-one interactions between human and machine towards many-to-many collaborations across *industrial ecosystems*.

With the increased connectedness brought about by the fourth industrial revolution, the frequency, complexity and variety of the interactions between humans and cyber-physical systems are also increasing. The scope of these interactions is also progressively extending beyond the traditional scenario of operator-machine interactions to interactions among ecosystems of connected people, machines, processes and systems. Furthermore, the requirements for industry in the future will likely necessitate a shift from simple human-system interaction towards human-system collaboration – requiring carefully coordinated or even shared human and autonomous actions towards achieving complex goals at different decision levels and scales of enterprises. Ultimately, it is important that the proposed human-system integration is achieved with a balanced consideration of the benefits (e.g. worker empowerment and wellbeing, system resilience) and risks (e.g. reduced situational awareness and control, loss of skills).

This special session welcomes contributions in the form of concept, position and short review papers, as well as papers reporting on case studies. Papers that propose methods, frameworks or tools for the design and/or evaluation of technologies or applications related to human-system integration are of particular interest. Furthermore, in accordance with the theme of the session, paper topics may include:

- Human-AI collaboration in industrial operations
- Monitoring and management of the wellbeing of humans in operational environments
- Opportunities and challenges for an augmented workforce
- Impact of technology on human work
- Considerations related to the skills and training of personnel
- Impact of technology on human decision making and decision support
- Applications of human digital twins

- Methodologies for the design or evaluation of human cyber-physical systems
- Ethical considerations for human-system integration

Considering the theme of the workshop, research that applies service-oriented, holonic and multi-agent systems approaches to human-system integration will be of particular interest to the SOHOMA community.

Keywords:

Human-system integration; Human cyber-physical systems; Industry 5.0; Human-centred manufacturing; Human factors and ergonomics; Ethics

Important dates:

Full paper submission	May 16, 2025
Notification of acceptance/Rejection	June 13, 2025
Final camera-ready paper submission	July 11, 2025
Early registration and fee payment	July 18, 2025
SOHOMA 2025 Workshop	**October 02-03, 2025**