SOHOMA'26 Special Session

Bridging Agentic AI and Agent-based Systems for Logistics and Supply Chain Management

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Topic overview

The increasing digitalisation of industrial systems, combined with recent advances in Agentic Artificial Intelligence (AI) and Large Language Models (LLMs), is transforming the design and operation of supply chain and logistics systems. Beyond traditional data analytics and rule-based decision systems, agentic AI enables goal-oriented, autonomous agents capable of reasoning, learning, negotiation, and coordination in complex and dynamic environments.

Within the agent-based systems research community, multi-agent systems, holonic architectures, cyber-physical systems, and service-oriented approaches have long provided foundational concepts for distributed and decentralised production and logistics systems. However, classical agent-based approaches have faced limitations related to scalability, interoperability, system-wise holistic orchestration and cooperation. The emergence of LLM-enabled agentic systems, digital twins and cyber-physical systems, and AI-orchestrated architectures offers new opportunities to revisit and extend these paradigms, enabling more adaptive, interoperable, and human-centric logistics and supply chain systems.

This special session aims to provide a focused forum for researchers and practitioners to present theoretical advances, conceptual and methodological contributions, and industrial applications of agentic AI and agent-based systems in supply chain and logistics, in line with the SOHOMA conference themes. Topics of interest include, but are not limited to:

- Agentic and holonic architectures for supply chain and logistics systems
- Decentralised and hierarchical control
- Service-oriented and AI-orchestrated systems design
- Coordination, negotiation, and interoperability in AI-based Multi-Agent Systems

- Agent-to-Agent communication, collaborative planning, privacy-preserving coordination across organisations
- Cognitive digital twins, agentic digital twins, digital twin agents and cyber-physical systems in logistics and supply chains
- Integration of agentic AI with optimisation, operations research, reinforcement learning, for supply network design, transportation optimisation, operations management, etc.
- Human-centric and responsible agentic AI systems, Human-in-the-loop control, interactions, governance, trust, and ethical considerations
- Performance assessment, resilience and robustness under uncertainty, sustainability scalability, and industrial case studies

Keywords
Logistics, Supply Chain, LLM, Agentic AI, Multi-Agent Systems, Holonic and Decentralised Control, AI-Orchestrated Systems, Human-Centric and Responsible AI.

Important dates
Full paper submission: 5 April 2026
Notification of decision: 4 May 2026
Early registration and fee payment: 1 June 2026
Final camera-ready paper submission: 13 July 2026

(Please consult the SOHOMA'26 website for updates and further information)