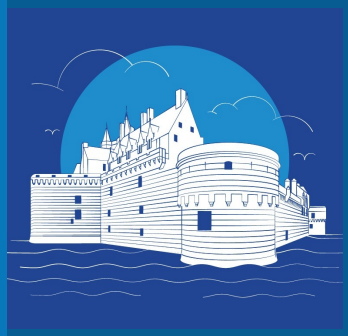
IFAC
INTERNATIONAL FEDERATION OF AUTOMATIC CONTROL

28–30 JUNE 2027

INCOM 2027 • NANTES
Information, Control and Optimization in Manufacturing
AI and digital technologies for resilient and sustainable production and logistics



TRACK

PAPERCEPT • 56h2a

Hybrid AI for Manufacturing, Logistics and Supply Chains: Combining Symbolic Reasoning, Constraint Programming, Optimization, LLMs and Machine Learning

Official Track Proposal - Validated content

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TRACK SUMMARY

Modern manufacturing, logistics and supply chain systems combine highly combinatorial decision problems with large volumes of heterogeneous data, uncertain environments and increasingly dynamic operational constraints. In this context, Symbolic Artificial Intelligence, and in particular Constraint Programming (CP), combinatorial optimization, declarative modelling and knowledge-based reasoning, provide powerful mechanisms for representing constraints, reasoning about complex systems and producing reliable decisions. At the same time, recent advances in Machine Learning, Data Mining, Knowledge Graphs, Large Language Models and Agentic AI offer new possibilities for extracting knowledge from industrial data, learning from historical decisions, interacting with optimization models and supporting increasingly autonomous decision-making. This special session aims to explore hybrid AI approaches for manufacturing, logistics and supply chains, integrating symbolic reasoning, Constraint Programming, optimization, Large Language Models and Machine Learning. Particular attention is given to methods that combine these complementary paradigms to improve decision-making, reliability, scalability and explainability in complex industrial environments.

KEYWORDS

Combinatorial Optimization | Constraint Programming | Hybrid AI | Large Language Models (LLMs) | Machine Learning for Optimization | Manufacturing and Supply Chain | Symbolic reasoning

TOPICS OF INTEREST

Topics include, but are not limited to, the following areas in manufacturing, logistics and supply chains:

- CP and ML for scheduling, planning and routing (e.g. hybrid optimization architectures, learning to branch, surrogate modelling) ;
- LLM-assisted modelling, constraint generation and optimization ;
- Neuro-symbolic and hybrid AI for industrial decision-making ;
- Agentic and multi-agent AI interacting with symbolic reasoning, operations research and optimization solvers for manufacturing, logistics and supply chains ;
- Knowledge Graphs, ontologies, Graph-RAG and knowledge-grounded AI ;
- Declarative data mining, pattern discovery and constraint acquisition from historical data and expert feedback ;
- Multimodal AI combining industrial documents, text, images, sensors and engineering data ;
- Human-in-the-loop AI and human-AI collaboration for decision support ;
- Prompt engineering and interaction design for LLM-based industrial decision support and optimization workflows ;
- Explainability, reliability, robustness, uncertainty management and trust in hybrid AI systems ;
- Real-world applications and scalable deployment of hybrid AI approaches in manufacturing, logistics and supply chains.

IMPORTANT DATES

14 DEC 2026

Invited session / track paper submission deadline

31 JAN 2027

Notification to authors

01 APR 2027

Final paper submission deadline

28-30 JUN 2027

INCOM 2027 - Nantes, France

SUBMISSION IN PAPERCEPT

Papers intended for this track must be submitted in PaperCept as an Open Track Paper and must use the PaperCept code assigned to this track.

CODE 56h2a

Do not submit it as a Regular Paper if it belongs to this track.