11th IFAC Conference on Manufacturing Modelling, Management and Control
Trondheim, Norway, 30 June - 3 July 2025

11th IFAC Conference on Manufacturing Modeling, Management and Control (MIM2025), June 30 – July 03, 2025, Trondheim, Norway

Invited Session:

Supply Chain AI: Opportunities and Challenges

Invited Session Code: ****

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Over the recent years, trade restrictions, the COVID-19 pandemic, and geopolitical conflicts have markedly exposed the vulnerabilities within traditional supply chains. These events underscore the need for organisations to establish more resilient and flexible supply chains. Given the ever-evolving nature of the global trade environment, technologies rooted in Artificial Intelligence (AI) and Data Science may play an increasingly essential role in future supply chain management (SCM). Notably, there have been remarkable advancements in the field of artificial general intelligence domain, exemplified by generative AI developments such as OpenAI ChatGPT --- a sophisticated chatbot based on large language models (LLMs). The synergies of traditional AI technologies and the capabilities enabled by LLMs are expected to bring about transformative changes in various domains, including SCM.

Certainly, the prominence of AI and its impact on supply chain has grown considerably; however, it is often characterised by a combination of opportunities and challenges. AI technologies, such as reinforcement learning, have introduced prospects for achieving scalability in existing NP-hard problems within SCM that prove challenging with traditional optimisation techniques. Federated approaches can facilitate collaborative forecasting on demand and delivery delay across multiple distributed parties in a supply chain without the need to share sensitive raw data. LLMs may enable the creation of AI agents capable of handling daily operational tasks in SCM, such as customer feedback analysis, responding to online inquiries, and even performing descriptive data analysis and presentation.

Opportunities come with challenges. It is widely accepted that AI models are built upon large datasets. Almost all established AI domains have a large number of open-source datasets that are available for free use to train, test, and evaluate AI models. However, this is not the case in SCM. Dataset availability in SCM is extremely limited, most of the available datasets are proprietary. This situation might be due to data sensitivity in SCM and a lack of incentives, among other reasons. The

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shortage of datasets and benchmarking poses challenges to creating effective AI models for tackling SCM-related tasks. Additionally, modern AI approaches have increasingly relied on deep neural networks. Though much work has been devoted to their explainability and interpretability, there are still considered black boxes with uncertainties. More research is needed to address these challenges to deliver effective, scalable, and trustworthy AI systems in SCM.

This session thus aims to address supply chain AI, offering a venue to discuss challenges and opportunities at the intersection of AI and SCM.

Topics may include, but are not limited to:

- Predictive Analytics for Supply Chain Visibility
- Autonomous Decision-Making in Supply Chain Operations
- Optimisation in Supply Chain Management using Machine Learning
- AI for Risk Management and Mitigation
- Human-Agent Collaboration
- LLMs and AI Agents for Supply Chain Management
- Uncertainty and Explainability of AI Models in Supply Chain Management
- AI for Achieving Scalability in Traditional Optimisation Problems
- Privacy-Preserving Data / Knowledge Sharing
- Decentralised Architecture for Data Sharing over Supply Chains
- Knowledge Graphs in Supply Chain Management
- Credit Assignment in Cooperation over Supply Chains
- Generative AI for Supply Chain Data Generation
- Benchmarking Machine Learning Tasks in Supply Chain AI

Important Dates:

Deadline for manuscript submission:	*30 November 2024*
Notification of acceptance:	*30 January 2025*
Camera-ready paper submission deadline:	*28 February 2025*

Submission Guidelines:

For author guidelines, please refer to www.ifac-control.org. All papers must be submitted electronically using https://ifac.papercept.net/ and must follow the two-column format in accordance with the IFAC manuscript style. Please use the official IFAC instructions and template to prepare your contribution as a full-length draft paper (6 pages). Submission details are available on the symposium website. There is the possibility to submit discussion papers (limited to 4 pages) that are published in the preprints only. All submissions must be written in English. All articles that comply with the submission guidelines will be peer-reviewed by IPC members. The corresponding author submits the paper online (pdf format) as an open-invitation session paper. **Submission as an invited paper requires the invited session code: ****.**

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