

# 18th IFAC Symposium on Information Control Problems in Manufacturing (INCOM 2024) <https://www.incom2024.org>

## Invited Session:

### Challenges and Opportunities in Supply Chain AI

**Invited Session Code: r871n**

#### Organized by:

Liming Xu	University of Cambridge, UK
Dmitry Ivanov	Berlin School of Economics and Law, Germany
Alexandra Brintrup	University of Cambridge, UK
Giovanna Martinez Arellano	University of Nottingham, UK
George Baryannis	University of Huddersfield, UK

Over the recent years, trade restrictions, the COVID-19 pandemic, and geopolitical conflicts has markedly exposed the vulnerabilities within traditional supply chains. These events underscore the need for organisations to establish more resilient and flexible supply chains. Giving the ever-evolving nature of global trade environment, technologies rooted in Artificial Intelligence (AI) and Data Science may play 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 ChatGPT --- a sophisticated chatbot based on large language models (LLMs) developed by OpenAI. 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, has 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 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 available datasets are proprietary. This situation might be due to data sensitivity in SCM and a lack of incentives, among other reasons. The 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 blackboxes 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
- 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 Sharing
- Decentralised Architecture for Data Sharing over Supply Chains
- Knowledge Graphs in Supply Chain Management
- Credit Assignment in Cooperation over Supply Chains
- Benchmarking in Supply Chain AI

**Submission**

For author guidelines, please refer to [www.ifac-control.org](http://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. 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: r871n. Special issues of INCOM 2024 Conference are planned in IFAC and other high-ranking journals.**

**Important Dates**

Draft paper submission deadline:	31 January 2024
Notification of acceptance:	15 March 2024
Final papers submission deadline:	15 April 2024
Young author award nomination:	15 May 2024
Conference date:	28 – 30 August 2024
Early registration deadline:	30 April 2024
Late registration deadline:	31 July 2024