

Open Invited Session

“Simulation modeling, machine learning and optimization algorithms to support decision making in production, logistics, and supply chain management”

Invited session code: v1ia6

11th IFAC Conference on Manufacturing Modelling, Management and Control (IFAC MIM2025)
30 June – 03 July, 2025, Trondheim, Norway
<https://conferences.ifac-control.org/mim2025>

Organized by:

Tobias Reggelin	Otto von Guericke University Magdeburg	tobias.reggelin@ovgu.de
Sebastian Lang	Otto von Guericke University Magdeburg	sebastian.lang@ovgu.de
Stefan Galka	OTH Regensburg	stefan.galka@oth-regensburg.de
Nasser Mebarki	Nantes Université	nasser.mebarki@univ-nantes.fr
Lorena Reyes-Rubiano	RWTH Aachen	reyes@analytics.rwth-aachen.de
Mona Wappler	HS Rhein-Waal	mona.wappler@hochschule-rhein-waal.de

Enterprises still make a lot of decisions in production, logistics, and supply chain management based on simple rules or the individual know-how of the decision-makers. The use of simulation modeling, machine learning, and optimization algorithms can lead to drastically better decision making. The ongoing digitization, the pursuit of concepts related to Industry/Logistics 4.0, further increasing computational power and more and more well-educated employees in enterprises provide an excellent basis for the application of the above-mentioned models to support decision making. Not only humans but also automated systems have to make good decisions in a short time span. AI models promise a new quality of decision-making in real time. Another area for in which effective decision-making is of growing importance is humanitarian logistics. In today's interconnected world, global crises and disruptions - whether economic, social, or environmental- can significantly impact supply chains and logistics operations. **Humanitarian logistics**, which deals with **efficiently managing and distributing resources during such crises**, has become increasingly relevant to businesses. Effective decision-making in this field not only aids in responding to emergencies but also helps companies maintain continuity, manage risks, and minimize the economic fallout from these disruptions.

For these reasons, this session focusses on **academic research** and **case studies** related to **simulation, optimization** and **machine learning** and their applications to support both **real-time operational decisions** and **middle/long-term planning decisions** in **production, logistics, and supply chain management** which go beyond the state of the art.

The session chairs also invite lecturers from academia and industry to present new **educational concepts** for **application-oriented teaching** of **simulation modeling, optimization** and **AI** with application in production, logistics, and supply chain management.

The session chairs invite researchers and decision makers from academia and industry to contribute theoretical and applied research papers in areas including but not limited to the following topics:

Methods

- Discrete-event simulation, hybrid simulation, system dynamics simulation, agent-based simulation, adaptive simulation models
- Optimization heuristics
- Models from the field of AI, e.g. machine learning

Applications

- Production, logistics, and supply chain management
- Real-time operational decision making, tactical decision making, and strategic decision making
- Scheduling and routing problems
- Intralogistics and warehouse design
- Automated systems and robotics
- Digital twins and cyber-physical systems for planning and control of processes in manufacturing, logistics and supply networks
- (Re)configuration of supply networks
- Risk Management, disruption propagation, network analysis
- Urban and
- Sustainable logistics systems, incl. energy consumption and efficiency in manufacturing and logistics systems. Approaches considering the availability of renewable energy in the management/control of production and logistics systems
- Humanitarian logistics and disaster management
- Application-oriented teaching of simulation modeling, optimization and AI

Submission:

Draft papers reporting original research (limited to 6 pages in IFAC format) are welcome. When you submit your paper to the IFAC system, you will be required to use the invited session code **xxx** to associate your paper to the invited session: <https://ifac.papercept.net>. For author guidelines, please refer to www.ifac-control.org.

Important dates:

Paper Submission:	30.11.2024
Notification to authors:	30.01.2025
Final paper submission:	28.02.2025

Accepted papers will be published open access in Elsevier's IFAC-PapersOnLine. Post-conference special issues for extended versions of accepted papers are planned in high-ranked journals.