

Open Invited Session

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

Invited session code: **3q6i4**

18th IFAC Symposium on Information Control Problems in Manufacturing (INCOM 2024)

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Organized by:

Tobias Reggelin	Otto von Guericke University Magdeburg, Germany	tobias.reggelin@ovgu.de
Sebastian Lang	Fraunhofer IFF Magdeburg, Germany	sebastian.lang@iff.fraunhofer.de
Stefan Galka	OTH Regensburg, Germany	stefan.galka@oth-regensburg.de
Nasser Mebarki	Nantes Université, France	nasser.mebarki@univ-nantes.fr
Lorena Reyes Rubiano	RWTH Aachen University	reyes@analytics.rwth-aachen.de

Enterprises still make a lot of decisions in production and logistics 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.

For this reason, this session focusses on models 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 and logistics** which go beyond the state of the art. Furthermore, the session includes **concepts for application-oriented teaching** of the session’s topics in academia and practice.

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:

- Microscopic, mesoscopic, macroscopic, hybrid, and adaptive simulation models
- Models from the field of AI, e.g. machine learning
- AI to improve the decision making of automated systems in logistics
- Optimization heuristics, e.g. for scheduling and routing problems
- Real-time operational decision making, tactical decision making, and strategic decision making in production and logistics
- Digital twins and cyber physical systems for planning and control of processes in manufacturing, logistics and supply networks, incl. standardization of data models for digital twins
- (Re)configuration of supply networks
- Sentiment Analysis to Improve Sourcing Decisions in Supply Chains
- Urban and sustainable logistics systems, incl. energy consumption and efficiency in manufacturing and logistics systems
- Data-driven and model-driven simulation

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 and logistics.

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 **3q6i4** in order to associate your paper to the invited session: <https://ifac.papercept.net>. For author guidelines, please refer to www.ifac-control.org.

Important dates:

Draft Paper Submission:	31.01.2024
Reviewing papers:	15.03.2024
Final paper submission:	15.04.2024
Early registration deadline:	30.04.2024

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.