

Open Invited Track

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

Invited track code **xs225**

IFAC World Congress 2023, June 9-14, 2023, Yokohama, Japan

The 22nd World Congress of the International Federation of Automatic Control, <https://www.ifac2023.org/>

IFAC TC 5.2. Management and Control in Manufacturing and Logistics

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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 same applies for public/governmental authorities for decisions related to public logistics systems. The use of simulation modeling, machine learning, and optimization algorithms can lead to drastically better decision making in enterprises and authorities. 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 and authorities provide an excellent basis for the application of the above-mentioned models to support decision making in enterprises and authorities. For this reason, this track focusses on all kind of 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 and concepts for application-oriented teaching of these topics in academia and practice.

The track 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
- Optimization heuristics, e.g. for location and transport optimization
- 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
- Urban and sustainable logistics systems, incl. energy consumption and efficiency in manufacturing and logistics systems
- Virtual commissioning, Assistance systems
- Data-driven and model-driven simulation

The track 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:**

There are three paper categories for the World Congress:

- **Regular papers** will have 6 pages length limitation. Please note that there is no option to pay for extra pages for the final version (after acceptance). At the time of initial submission, however, regular papers can be up to 8 pages for review.
- **Survey papers** overviewing a research topic are also most welcome, and 12 pages limitation will apply to such papers in the final form. For initial submission, 14 pages are allowed.
- **Discussion papers** are introduced to encourage participation from industry and from colleagues outside the traditional academic control community. Such papers should be submitted in the form of extended abstracts typically between 2 and 4 pages in length, and the congress will accept a limited number of them based on ad hoc peer reviews. Authors will present their contribution in oral or interactive sessions. Discussion papers will appear only in the congress preprints, not in the congress proceedings.

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 full-length draft paper. Submission details are available on the symposium website <https://www.ifac2023.org/submission/submit-contribution/>. All submissions must be written in English. All papers that conform to submission guidelines will be peer-reviewed by IPC members. The corresponding author submits the paper online (pdf format) as an open invited track paper. Submission as an invited paper requires the invited session code: **xs225**.

### **Important dates:**

#### **First submissions**

October 31, 2022	Open invited track paper
October 31, 2022	Open invited track survey paper
November 30, 2022	Open invited track discussion paper

February 21, 2023	Notification of acceptance
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#### **Final submissions**

March 31, 2022	Open invited track paper
March 31, 2022	Open invited track survey paper
March 31, 2022	Open invited track discussion paper

The congress program will be published in Diamond Open Access in partnership with Elsevier in the IFAC-PapersOnline series, hosted on the ScienceDirect platform.

Post-conference special issues for extended versions of accepted papers are planned in IFAC and other high-ranked journals.