



Open Invited Track

Advances in decentralised management and control of Industry 4.0 manufacturing systems

Organised by:

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In the last decades, manufacturing has seen a paradigm shift towards customer-centric value creation rather than mere cost reductions, driven by continuous globalization and ever-changing market environments. Despite the technological advancements brought about by earlier industrial revolutions and Industry 4.0, a significant gap has been seen in the evolution of the logic and design of Manufacturing Planning and Control (MPC). In this kind of context, where enhanced personalisation is the foundation of products added value, maintaining responsiveness even in a Make-to-Order (MTO) environment is a critical goal to be achieved. To this end, overcoming the limitations of traditional centralised production control systems is a necessary step to increase both resource utilisation and responsiveness in high customisation environments. Addressing this challenge is a big leap forward, representing one of the primary drivers for the success of the Industry 4.0 paradigm, hugely impacting on manufacturing system configuration, MPC architecture and production control logics.

This session aims to explore recent advances in modeling and implementation of decentralised control in manufacturing systems. Developed methodologies are expected to involve analytical modeling, quantitative approaches, and simulation models, but also qualitative approaches and case studies. Topics may include, but are not limited to:

- Decentralised production control;
- Complexity management of decentralised manufacturing systems;
- Decentralised manufacturing systems design techniques;
- Lead time reduction and prediction;
- Architectures for Manufacturing Planning and Control (MPC) for decentralised and hybrid systems;
- AI-based approaches for decentralised manufacturing system control and performance prediction;

- Knowledge-based approaches for production planning in Industry 4.0 manufacturing systems;
- Bargaining techniques for machine-to-machine negotiation;
- Cyber-Physical System (CPS) protocols and object-oriented data modelling for Industry 4.0;
- Stochastic models of decentralised manufacturing systems;
- Manufacturing-as-a-Service (MaaS).

Papers must be submitted electronically using the IFAC PaperPlaza Conference Manuscript Management System: www.ifac.papercept.net.

All submissions must be in PDF format, written in English, and prepared according to the IFAC format. Please visit www.ifac.papercept.net/conferences/manuals/authorgetstarted.pdf for detailed instructions.

Papers submissions will be due before December the 25th, 2021 through the conference submission platform, selecting “Open Invited Track Paper” and entering the session code **£98mm**

Deadlines can be postponed, so please keep an eye on the [conference web page](#).

Accepted papers will be published on IFAC-PapersOnline, while special issues of the MIM 2022 are planned in high-ranked journals such as *International Journal of Production Research*, *Flexible Services and Manufacturing Journal*, *Annals of Operations Research*, *International Journal of Integrated Supply Management*, and *Algorithms*.