**11th IFAC Conference on
Manufacturing Modelling, Management and Control**
Trondheim, Norway, 30 June - 3 July 2025

Invited Session

Intelligent Governance and Control in Manufacturing and Service Systems

Organised by:

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In recent years, the rapid evolution of digital technologies has transformed both production and service systems, shifting the focus from traditional efficiency-driven strategies to intelligent, adaptable architectures capable of responding to dynamic and complex environments. Manufacturing Planning and Control (MPC) architectures have become central to this transformation, serving as the backbone for integrating advanced technologies such as Reinforcement Learning (RL) and distributed control systems. While Industry 4.0 has revolutionized many aspects of manufacturing and services, significant challenges remain in designing and implementing advanced MPC architectures that enhance agility, scalability, and intelligence, especially in environments requiring high customization and on-demand capabilities.

To address these challenges, this invited session will explore recent advances in the modelling, design, and application of decentralized and distributed control architectures in both production and service systems. We will feature analytical models, data-driven techniques, and practical case studies that demonstrate how advanced MPC architectures are reshaping modern industrial and service environments.

Topics of interest include, but are not limited to:

- **Manufacturing Planning and Control (MPC) Architectures:** Advanced strategies for predictive control to optimize decision-making in dynamic production and service environments.

- **Reinforcement Learning for Autonomous Control:** Applications of artificial intelligence and machine learning techniques to enhance the autonomy and adaptability in both production and service systems.

- **Distributed and Decentralized Control Systems:** Novel approaches for managing complexity, scalability, and performance in decentralized production and service systems.

- **Intelligent Systems Integration in Manufacturing and Services:** Case studies showcasing successful implementations of intelligent control systems, improving flexibility and operational efficiency across sectors.

- **Integration of Cyber-Physical Systems (CPS) and IoT:** Protocols and architectures for enabling real-time data exchange and control in smart manufacturing and service systems.

- **Stochastic and AI-driven Approaches to Monitor and Governance:** Techniques for modelling uncertainty and optimizing system performance in intelligent production and service systems.

This session will provide a comprehensive overview of the latest developments in intelligent production and service systems, offering valuable insights into how AI-driven control systems, decentralized architectures, and innovative governance models can be leveraged to meet the demands of modern manufacturing and services.

For author guidelines, please refer to www.ifac-control.org. All papers must be submitted electronically at https://ifac.papercept.net/.

All papers must be prepared in a 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 and submit it on line. Submission details are available on the conference website. All submissions must be written in English. All papers that are conform to submission guidelines will be peer-reviewed by IPC members.

The corresponding authors need to submit their paper online (pdf format) as Invited Session Paper using the following code: **bwx37**

Important dates:

- Draft paper submission: 30st November 2024

- Notification of acceptance: 30th January 2025

- Final paper submission: 28th February 2025