15th IFAC Workshop on Intelligent Manufacturing Systems

11-12.09.2025, Koszalin, Poland

15th IFAC Workshop

Intelligent Manufacturing Systems (IMS 2025)

Koszalin, Poland, 11-12 September 2025

https://ims2025.pl/

This proposal is endorsed by TC 5.1

Invited Session Proposal:

Error-Free Manufacturing Control

Proposed by: Ahmad Barari (Canada), Marcos de Sales Guerra Tsuzuki (Brazil), Jill Urbanic (Canada), Mukund Janardhanan (UK), Dariusz Mazurkiewicz (Poland)

Keywords: Intelligent Manufacturing Control, Error Modeling, Digital Twin, Data Analytic, Data Collection, Metrology and Inspection; Cyber-Physical Systems

Code: p997p

ABSTRACT

It has been a great effort in Industry 4.0 and 5.0 eras to eliminate, reduce, model, calibrate, and compensate for various sources of the errors in manufacturing and production systems. The applications of closed-loops of inspection and manufacturing process control have been implemented widely and the actual integration of data collection/analytics with dynamic process planning in manufacturing have created many promising results. The developed methodologies also include a wide category of research achievements in developing "Digital Manufacturing Twins", where a combination of manufacturing process simulation and data-driven online manufacturing process control with support of artificial intelligence and machine learning work together to compensate and/or eliminate various types of systematic and non-systematic manufacturing errors.

This session provides an excellent forum for scientists, researchers, engineers and industrial practitioners to meet and share experiences, theoretical knowledge or application examples based on the latest trends in developing intelligent solutions, methodologies, and approaches to various error elimination, reduction, modelling, calibration, and compensation tasks in manufacturing and production systems. Authors are invited to submit full papers describing original research work associated in areas including, but not limited to,

- Modeling Manufacturing Systematic Errors
- Manufacturing Process Calibration
- Manufacturing Error Compensation
- Manufacturing Non-Systematic Errors
- On-Line Inspection
- Digital Twins in Manufacturing Error Estimation
- Digital Twin for Predictive Process Maintenance
- Digital Twin for Prescriptive Process Control
- Vision Systems for Online Metrology and Inspection
- Metrology and Inspection Process Planning
- Data Analytics for Online Metrology and Inspection
- Inspection and Monitoring Sensors
- Digital Metrology and Inspections
- Coordinate Metrology Systems
- Measurement Uncertainties
- Computer Aided Manufacturing (CAM)- based Inspection Planning
- Manufacturing Process Control for Error Compensations
- Innovative Measurement Techniques with Artificial Intelligence
- Smart Data Analytics for Optimum Accessibility and Usability
- Manufacturing Systems Health Management and Optimization

Timeline:

- **December 16, 2024:** Deadline for paper submission
- **March 03, 2025:** Notification of acceptance/rejection
- **April 07, 2025:** Final paper submission
- **September 11-12, 2025:** 15th IFAC IMS Workshop (IMS 2025), Koszalin, Poland

Manuscript Preparation

For Manuscript Preparation please look at http://www.ifac.papercept.net/conferences/support/support.php
For Manuscript submission please look at https://ifac.papercept.net/conferences/scripts/start.pl
Upon submission, make sure to use the **Invited session identification code: to be announced latter**

For any further information, please contact the Special Session Technical Committee

Guest Editors	
Prof. Ahmad Barari Ahmad.Barari@ontariotechu.ca Department of Mechanical and Manufacturing Engineering, University of Ontario Institute of Technology, Oshawa, Canada	**Prof. Marcos de Sales Guerra Tsuzuki** mtsuzuki@usp.br Department of Mechatronics and Mechanical Systems Engineering, University of São Paulo, São Paulo, Brazil
Prof. Jill Urbanic jurbanic@uwindsor.ca Department of Mechanical, Automotive and Materials Engineering, University of Windsor, Windsor, Canada	**Prof. Mukund Janardhanan** mukund.janardhanan@warwick.ac.uk Faculty of Engineering, University of Warwick, Coventry, UK
Prof. Dariusz Mazurkiewicz d.mazurkiewicz@pollub.pl Faculty of Mechanical Engineering, Lublin University of Technology, Lublin, Poland	