15th IFAC Workshop

Intelligent Manufacturing Systems (IMS 2025)

Koszalin, Poland, 11-12 September 2025

This proposal is endorsed by TC 5.1

Invited Session Proposal:

Intelligent Additive Manufacturing

Proposed by: Marcos de Sales Guerra Tsuzuki (Brazil), Ahmad Barari (Canada), Yaoyao Fiona Zhao (Canada). Jill Urbanic (Canada), Franz-Josef Villmer (Germany), Jay Jumyung (South Korea)

Keywords: Additive Manufacturing; Artificial Intelligent; Machine Learning; Digitalization; Smart manufacturing; Cyber-Physical Systems

Code: s12c3

ABSTRACT

Additive Manufacturing (AM) is highly susceptible for digitalization in its various stages including Design for Additive Manufacturing, Additive Manufacturing Pre-Processing, Additive Manufacturing Process, and Additive Manufacturing Post-Processing. The created digitalized environment in AM successively results in great capabilities to add intelligence.

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 decision making tasks in additive manufacturing stages, as well as future directions and trends aimed to use artificial intelligence

and machine learning to deal with the growing demand for new materials, geometric representation, part design, in-process monitoring, decision-making, etc.

Authors are invited to submit full papers describing original research work associated with different additive manufacturing problems in areas including, but not limited to:

Artificial Intelligence in design for AM
Artificial Intelligence in AM Pre-Processing
Artificial Intelligence in AM Process Control
Artificial Intelligence in AM Post-Processing and downstream applications
Intelligent Computer Aided Design (CAD) for AM
Computational Geometry for AM
Design and modelling of Lattice Structures
Intelligent Topology Optimization for AM
Verification & Validation of Computational Models for AM
Tolerance analysis and representation for AM products
Dimensional and geometric measurement of AM products
Surface integrity of additive manufacturing parts
Development of new materials for AM
Intelligent design for additive manufacturing
3D packing of parts in the printing workspace
Finite element analysis applied to additive manufacturing
Evolutionary computation in optimizing additive manufacturing processes
From 3D scan to additive manufacturing
Intelligent decision-making in additive manufacturing processes
Transition of AM from prototyping to industrial production

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. Marcos de Sales Guerra Tsuzuki mtsuzuki@usp.br Department of Mechatronics and Mechanical Systems Engineering, University of São Paulo, São Paulo, Brazil	**Prof. Ahmad Barari** Ahmad.Barari@ontariotechu.ca Department of Mechanical and Manufacturing Engineering, University of Ontario Institute of Technology, Oshawa, Canada
Prof. Yaoyao Fiona Zhao yaoyao.zhao@mcgill.ca Department of Mechanical Engineering, McGill University, Montreal, Canada	**Prof. Jill Urbanic** jurbanic@uwindsor.ca Department of Mechanical, Automotive and Materials Engineering, University of Windsor, Windsor, Canada
Prof. Franz-Josef Villmer franz-josef.villmer@th-owl.de Department of Mechanical Engineering and Mechatronics, OWL University of Applied Sciences and Arts, Lemgo, Germany	**Prof. Jay Jumyung Um** jayum@khu.ac.kr Department of Industrial & Management System Engineering, Kyung Hee University, Yongin-si, Gyeonggi-do, South Korea