



17th IFAC Symposium on Information
Control Problems in Manufacturing
7-9 June 2021, Budapest, Hungary



Digitalization in Product Design, Manufacturing and Maintenance (Digitalization for DMM)



This open track is sponsored by IFAC TC5.1, Manufacturing Plant Control Technical Committee and Intelligent Manufacturing Systems (IMS) Working Group

Invited Track Code: **535t1**

Chairs:

Prof. Marcos de Sales Guerra Tsuzuki, University of São Paulo, São Paulo, Brazil

Prof. Ahmad Barari, University of Ontario Institute of Technology, Oshawa, Canada

The digitalization of the analog world has been an efficient way to deal with various engineering problems in product life-cycle in formulating problems that are difficult to be represented in a closed-form or are difficult to be solved analytically. With the power of the computers and cyber-physical conjunctions, the trace of digitalization can be seen more often in the product life-cycle with reliable and efficient outcomes. This includes digitalization in product Design, manufacturing, and maintenance (DMM). Various control aspects are involved in each DMM process which are highly compatible with digitalization.

This open invited track 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 digitalization for Design, Manufacturing, and Maintenance processes, as well as future directions and trends aimed to deal with the growing demand for new methodologies, logistics, and their impacts on product life-cycle.

Recent design methodologies in employing multi-physics simulation, topology optimization, generative design, use of heterogeneous and functionally graded materials, and lattice and non-homogeneous structures need to be controlled in a concurrent and integrated way with the other product life-cycle activities. Digitalized manufacturing process including Additive Manufacturing are growing fast to create new manufacturing paradigm for industrial manufacturing. Additive manufacturing results in a new manufacturing environment with almost no geometrical and topological restrictions. However, despite of their great flexibilities, they impose new sets of constraints and limitation to the product life-cycle. Implementation of sensors, data analytics, condition monitoring, and digital twins also opened brand new chapters in product and process maintenance which demand for new controlling methodologies and procedures.

Authors are invited to submit full papers describing original research work associated with digitalization in product life-cycle (arising in design, manufacturing and maintenance) in areas including, but not limited to,

- Digital Design in concurrent Engineering
- Simulation control in design Verification & Validation
- Generative design and topology optimization
- Digitalization in developing heterogeneous and functionally graded materials
- Lattice and non-homogeneous structures
- evolutionary methods in product design optimization
- Cyber-physical components for Digital Manufacturing
- Tolerance analysis and representation for Additive Manufacturing
- Dimensional and geometric measurement of Additive Manufacturing
- Surface integrity of Additive Manufacturing parts
- Development of new materials for Additive Manufacturing
- Sensors and data collection from the product
- Digital metrology and inspection
- Digital condition monitoring
- Data analytics and Artificial Intelligence for maintenance
- Digital twins in condition monitoring and maintenance

Deadlines:

Submission deadline: October 31st, 2020

Notification of paper acceptance: December 15th 2020

Camera ready version submission: February 1st 2021

Paper Submission:

All manuscripts must be electronically submitted through the PaperPlaza Conference Manuscript Management System at <https://ifac.papercept.net> , using this Submission Code: **535t1**