



**MIM 2019**  
**9th IFAC Conference on**  
**Manufacturing Modeling, Management, and Control**

<http://blog.hwr-berlin.de/mim2019/>

**Invited session identification code: 5rn23**

**Modelling Assembly Design and Operations: Toward “Assembly System 4.0”**

**Abstract**

The optimal design and management of assembly systems is crucial to achieve production efficiency, product quality and customer satisfaction. While technology has a definite part in changing the assembly landscape, modelling, and new modelling techniques and approaches are paramount in improving the efficiency and effectiveness of assembly systems. The ongoing and incoming developments in technology are radical, and will not only improve manufacturing productivity and cost efficiency, but will change the way assembly systems operate and increase their product variety. The challenge is how to develop models that best utilize technological improvements in a brand new generation of smart manufacturing systems known as Industry 4.0 (the fourth industrial revolution). This includes advances in fields such as augmented reality, machine vision and tracking, smart sensors and their fusion, machine learning, artificial intelligence (AI), advanced smart robotics, computing capabilities and cloud computing (CC). Additionally, the Internet of Things (IoT) enables smart manufacturing by offering connectivity of manufacturing systems, devices, tools, products and components. All of these developments necessitate the development of proper optimization models, control algorithms, automation technologies and management methods, to allow the aforementioned smart cyber physical systems of self-optimization, self-configuration, self-diagnosis and intelligent support to workers in their increasingly complex tasks. The implementation of Industry 4.0 principles to assembly processes defines “Assembly System 4.0”, and requires the development of proper models, techniques and algorithms. These models techniques and algorithms would allow to better employ the “smart assembly stations” and “smart part logistics” and take full advantage of the virtual copy of the physical assembly process to enable quick and decentralized decisions. Thus, better models will lead to significant improvement of flexibility and speed of the whole assembly system that enables more customized products, an efficient and scalable production, and a high variance in production control.

This Open invited session seeks original manuscripts to investigate the design and management of “Assembly systems 4.0” exploiting mathematical models and methods, automation technologies, management techniques and approaches as well as industrial case studies.

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Possible topics of this Open invited track include but are not limited to:

- Smart assembly station design and management.
- Smart part logistics design and management.
- Self-optimization models for assembly systems, including innovative assembly line balancing and sequencing models able to quickly reconfigure the system.
- Self-configuration and self-diagnosis methods and technologies for assembly systems, including equipment and components configuration and control.
- Intelligent support systems to assist workers in their increasingly complex tasks.
- Innovative automation and robotic technologies to enhance the human-robot co-working.
- Virtualization and simulation techniques for decision making in the assembly process environment.
- Novel industrial and real world case studies to test and spread the adoption of “Assembly system 4.0”.
- Implementing new technologies in the assembly line (e.g., augmented reality, smart sensors, internet of things (IoT), artificial intelligence (AI), smart robotics, cloud computing (CC), etc.)

### Time schedule

December 15, 2019	Deadline for the submission
February 20, 2019	Notification of acceptance/rejection
March 15, 2019	Deadline for the final submission
March 31, 2019	Early registration deadline
28-30 August 2019	MIM 2019: 9th IFAC Conference on Manufacturing Modeling, Management, and Control

### 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: 5rn23**

For any further information, please contact the Open invited track Technical Committee

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