# Invited session:

# "Digital Twins for Smart Maintenance and Industrial Asset Management"

**Organizers**

| Name and Surname | Organization | Email |
|---|---|---|
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**Abstract**

Among the various benefits brought forward by the Industry 4.0, an eminent benefit is the opportunity to leverage on digital technologies, such as Internet of Things, connected smart devices, and machine learning and optimization algorithms to make improved decisions. Within this trend, Digital Twins represent a technological concept to promote the convergence of advanced solutions offering the cradle for model-based and data-driven approaches as strong foundations for a timely and intelligent decision-making.

New possibilities are opened by the use of Digital Twins in the creation of decision-making architectures and frameworks in the whole assets/systems' lifecycles at different levels of details (from item to systemic level) and to support different functionalities (monitoring, performance evaluation, diagnostics and prognostics, augmented operations, optimization). Research works on Digital Twins as advanced capability for Smart Maintenance and Industrial Asset Management may then cover different topics, including the technical and management spheres, the role of human operators, and the impact on sustainability, productivity and resilience.

**Keywords**

This special session calls high-quality contributions that investigate the main research challenges, reviews, case studies, and applications related to the following topics (but not limited to):

- Digital Twins for optimized asset performance management
- Digital Twins for maintenance, repair, diagnostics and prognostics
- Digital Twins for integrated production and maintenance management
- Digital Twins to support all phases of asset lifecycle management
- Data models for maintenance Digital Twins
- Data-driven simulation for diagnostics and prognostics
- Multi-physics simulation for diagnostics and prognostics
- Integrated simulation paradigms for asset performance management
- Integration and synchronization of real and virtual models
- New Methodologies centered on Digital Twins
- New Architectures integrating Digital Twins in information systems
- Digital Twin case studies from industry

**Invited papers**

Insert in the following table, at least five papers that will be submitted to the invited session.

| Paper tentative title / topic | Corresponding Author | Email |
|---|---|---|
| Digital Twin for health prognostics in production scheduling | *Elisa Negri* | Elisa.negri@polimi.it |
| A Monitoring Digital Twin for Services in Controlled Environment Agriculture | *David Sanchez Londoño* | d.sanchezl@uniandes.edu.co |
| Contribution 3 | *Nasser Jadi* | nasser.jazdi@ias.uni-stuttgart.de |

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