



July 9-14, 2023, Yokohama, Japan

Invited Session on

## **Advanced Prognostics and Health management for manufacturing systems in the era of Industry 4.0**

**IFAC technical committee:** TC 5.1. Manufacturing Plant Control

**Keywords:** Prognostics and Health Management; Predictive Maintenance; Intelligent manufacturing systems; Industry 4.0; Cyber-Physical Systems

### **Session Co-Chairs**

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### **Description and topics**

In recent years, the widespread deployment of internet of things (IoT) technology within manufacturing assets has facilitated the upgrade and transformation of manufacturing sectors towards the factory of Industry 4.0. In this context, the increasing requirements for the availability and reliability of complex production assets as well as the high safety of the working environment and reduction of maintenance costs have become important goals. One of the solutions to achieve this goal is to develop advanced Prognostics and Health Management (PHM) solutions. They include development of methods, algorithms, and tools that continuously monitor systems to early detect abnormal operating modes, diagnose probable causes, anticipate failures and take appropriate decisions accordingly.

In practice, the important growing of intelligent manufacturing systems complexity poses many challenges for PHM functionalities. Indeed, analyzing multiple heterogeneous sensor sources requires new powerful methods for acquisition, storage, fusion, and online processing of big data. Complex system structures and behaviors need to be studied, analyzed, and modeled in a thoughtful and intelligent way. The merging of digital and physical worlds leads to an increasing number of options to weigh in the optimization of the entire production and maintenance strategy. Therefore, this session aims to provide researchers and industrial experts and practitioners the opportunity to present and discuss recent solutions for the above-mentioned issues, as well as to share new perspectives.

The topics of interest include, but are not limited to:

- Data acquisition, processing, fusion and analysis of heterogeneous data,
- Multimodal learning for PHM,
- Physics informed machine learning for PHM,
- Condition monitoring, fault detection, diagnostics, and prognostics,
- Degradation modeling, health assessment, and remaining useful life estimation,
- Condition-based and predictive maintenance,
- Case studies on prognostics and health management.

### **Submission**

IFAC World Congress 2023 will be held on July 9-14th, 2023 (8 July - 9 July 2023 Workshops & Tutorials).

For more information, please visit the website <https://www.ifac2023.org/>

The authors are kindly invited to submit their contributions before **October 31th, 2022** through the IFAC WC 2023 submission website: <https://ifac.papercept.net/conferences/scripts/start.pl>.