Open Invited Track on

Prognostics and health management in manufacturing: New challenges and perspectives 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

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Description and topics

The continuous connection and communication of components in manufacturing and production factories in Industry 4.0 are making systems more intelligent day by day. Indeed, the widespread deployment of internet of things (IoT) technology within manufacturing assets facilitates the access to production processes and their relevant data, and therefore enables new smart solutions to optimize these processes, both in terms of efficiency and cost. One of the solutions to achieve this goal is to develop autonomous systems from the viewpoint of system health management. This could be done by developing methods, algorithms, and tools that continuously monitor systems to early detect abnormal operating modes, diagnose probable causes, anticipate failures and take appropriate decisions accordingly. These tasks are conducted in the framework of PHM, which allows the development of condition-based and predictive maintenance strategies to improve reliability, availability, maintainability, and safety of systems while reducing their operating and maintenance costs.

In practice, the important growing of intelligent manufacturing systems complexity poses many challenges for fault detection, diagnostic, prognostics, and maintenance 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 track 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.
- Condition monitoring.
- Fault detection, diagnostics and prognostics.
- Degradation modeling, health assessment, and remaining useful life estimation.
- Decision support for asset health management.
- Condition-based and predictive maintenances.
- Case studies on prognostics and health management.

Submission

The authors are kindly invited to submit their contributions before **October 31st, 2019** through the IFAC WC 2020 submission website: https://ifac.papercept.net/conferences/scripts/start.pl. During the submission, please select the “Open invited track paper” and enter the following code: **6n525**.