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Special Issue on Automation Analytics beyond Industry 4.0: From Hybrid Strategy to Zero-Defect Manufacturing

Most of traditional industries or emerging countries may not be capable of directly transiting to Industry 4.0. To fill the gap between as-is Industry 3.0 and to-be Industry 4.0, some disruptive innovations from automation and industrial engineering identify best practice with adopting the cost-effective semi-automated system to manage the potentially socio-economic impacts of infrastructure disruptions, while taking into account total resource management for sustainability. This is the so-called "Hybrid Strategy (HS)", or "Industry 3.5". On the other hand, the current Industry 4.0 related technologies should also emphasize on quality enhancement to achieve "Zero-Defect Manufacturing (ZDM)", i.e., referred to as "Industry 4.1". ZDM is a systematic strategy to realize the goal of Zero Defects, which includes two phases. Phase I: accomplish Zero Defects of all the deliverables by applying efficient and economical total-quality-inspection techniques; and Phase II: further ensure Zero Defects of all the products gradually by improving the yield with big data analytics and continuous improvement. Both of the challenges and opportunities from HS to ZDM have significantly expanded the scopes of traditional automation science and engineering.

The goal is to bring together researchers and practitioners into a forum, to show the state-of-the-art research and applications in these directions by presenting efficient scientific and engineering solutions, addressing the needs and challenges for integration of new automation technologies, and providing visions for future research and development. The central theme of the Special Issue will be bridging the gap from HS to ZDM. Specifically, the technologies related to "HS" and "ZDM" are encouraged, where hybrid strategy of technology development, hybrid strategy of industrial transformation, novel quality-assurance solution and virtual metrology, IoT, edge computing, cloud manufacturing, big data analytics, and cyber-physical systems are the focus areas, and broad aspects and issues will be discussed. Topics to be covered include, but are not limited to:

- Hybrid Strategy of Methodologies
- Hybrid Strategy of Industrial Transformation
- Digitalized fab by Internet of things (IoT), Cloud/Edge Manufacturing, Cyber Physical Systems,
- Big Data Analytics & Data Science
- Smart Production & Scheduling Optimization
- Green Supply Chain & Sustainability
- Advanced Process Control
- Virtual Metrology
- Simulation Optimization & Digital Twin
- Predictive Maintenance
- Prognostics and Health Management
- Flexible and Robust Manufacturing
- Real-Time Production Control

Important Dates

- Paper submission deadline: June 30, 2021
- Completion of the first round review: October 31, 2021
- Completion of the second round review: February 28, 2022
- Final submission due: March 31, 2022
- Tentative publication date: July 1, 2022.

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Paper Submission

All papers are to be submitted through the IEEE's **Manuscript Central** for Transactions on Automation Science and Engineering http://mc.manuscriptcentral.com/t-ase. Please select "Special Issue" under Manuscript Category of your submission. All manuscripts must be prepared according to the IEEE Transactions on Automation Science and Engineering publication guidelines http://www.ieee-ras.org/publications/t-ase. Please address inquiries to chengft@mail.ncku.edu.tw.