

Proposal for Special Session at IEEE CASE 2021

Goal:

- Over the past decade, Digital Twin has gradually evolved from a concept to in-depth applications in automobile, shipbuilding, aerospace and other industries. In the manufacturing stage, digital twin serves as a technical bridge between the physical production system and its digital replica. The extensive use of industrial sensors, high-fidelity virtual models and rich historical operational data enables intelligent manufacturing systems to emerge and evolve in a data-rich environment, where digital Twin is also introduced to enable the integration of manufacturing domain knowledge under various production scenarios. Supported by data-driven modelling, AI and machine learning, digital Twin offers insights on system behaviour in a predictive manner and empower inference decision making, thereby reducing the uncertainty concerning the performance of physical assets in service.
- This special session aims to present the latest theoretical and applied research of digital twins for intelligent manufacturing, document technological challenges, advances and future issues, and facilitate peer exchange of the latest findings and ideas.

Session Title:

[Advances of Digital Twin for Intelligent Manufacturing]

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Contributions:

1. “An application framework of digital twin and its case study” by Yu Zheng, Sen Yang, et al.
2. “Digital twin for geometric feature online inspection system of car body-in-white” by Yu Zheng, Liang Chen, et al.
3. “Digital Twins for Predictive Maintenance – Research and Applications” by Ying Liu, et al.
4. “Deep Learning for Digital Twins and its Application for Semiconductor Production Modelling” by Junya Tang, Li Li, et al.
5. “Digital twin modelling method based on biomimicry for machining aerospace components” by Shimin Liu, Jinsong Bao, et al.
6. “A Digital Twin-Driven Approach for the Assembly-Commissioning of High Precision Products” by Xuemin Sun, Jinsong Bao, et al.
7. “Digital twin-based designing of the configuration, motion, control, and optimization model of a flow-type smart manufacturing system” by Qiang Liu, Jiewu Leng, et al.
8. “Digital twin-driven rapid reconfiguration of the automated manufacturing system via an open architecture model” by Jiewu Leng, Qiang Liu, et al.