Call for Papers

IISE Transactions Special Issue on
Digital Twin for the Advancement of Design and Manufacturing

Sponsored by Focus Issue of Design and Manufacturing

Digital twin technologies are virtual representations of physical products, processes, and production systems that integrate sensor data. They are transforming design and manufacturing by enabling risk-free exploration, rapid digital prototyping, and life-cycle optimization, supporting simulation, modeling, analysis, and data-driven decision-making. Along this direction, emerging methodologies such as physics-informed modeling embed governing laws and constraints into data-driven frameworks, improving fidelity, robustness, and generalizability. This Special Issue highlights research opportunities for digital twins across design and manufacturing operations. The scope spans process-level modeling and control in additive, subtractive, and hybrid manufacturing, as well as system-level topics, such as product design, facility layout, production planning and scheduling, and smart manufacturing, grounded in digital-twin and physics-informed methods.

Relevant topics include, but are not limited to:

(1) Modeling and Simulation of Manufacturing Processes and Systems
- Multiphysics process modeling for additive, subtractive, and hybrid manufacturing.
- Digital-twin–based simulation of manufacturing systems.
- *Example methods: PINNs and other physics-informed models; stochastic processes and queueing networks; simulation; surrogate modeling; uncertainty quantification.*

(2) Optimal Design, Planning, and Operation of Manufacturing Systems
- Product and process design with digital twins; factory/facility layout.
- Production planning and scheduling; logistics and warehousing.
- *Example methods: robust and stochastic optimization; model predictive control; reinforcement learning; network analysis; game theory.*

(3) Data-driven Decision-making for Performance and Sustainability
- Anomaly detection, diagnostics, and root-cause analysis.
- Energy and resource efficiency; life-cycle assessment.
- *Example methods: machine learning; time-series analysis; Bayesian modeling; active learning.*

All papers are to be submitted through http://mc.manuscriptcentral.com/iietransactions. Please select "Special Issue" under Manuscript Category of your submission. All manuscripts must be prepared according to the IISE Transactions publication guidelines.

Key Dates
- Manuscript submission deadline: March 1, 2026
- Expected completion of 1st round review: July 1, 2026
- Expected completion of 2nd round review: November 1, 2026
- Expected final manuscript submission: December 31, 2026
- Tentative publication date: April 30, 2027

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