ASME Publishing
Journals, ver. June 2024
Special Issue Call for Papers Request Form

Journal Name: Journal of Manufacturing Science and Engineering
Special Issue Title: Physics-Informed Machine Learning for Advanced Manufacturing
https://www.asme.org/publications-submissions/journals/administration/call-for-papers/special-issue-on-physics-informed-machine-learning-for-advanced-manufacturing

Description:
Modeling of manufacturing processes, machines, and systems is the everlasting theme of advanced manufacturing. Compared to conventional physics-based analytical or numerical models, data-driven methods such as machine learning (ML) have been shown to be an alternative approach to prediction and optimization. However, the inherent "black box" nature of data-driven ML techniques such as those represented by neural networks has often presented a challenge to interpret ML outcomes, particularly when the training dataset may be limited or noisy. On the other hand, manufacturing physical laws (e.g., ordinary or partial differential equations) and domain knowledge are not effectively utilized to develop data-efficient ML algorithms.

To leverage the advantages of ML and physical laws of advanced manufacturing, this call focuses on physics-informed machine learning (PIML) by integrating ML techniques and physical laws to improve the accuracy, efficiency, and generalization of predictive models. PIML can be particularly useful for advanced manufacturing where the underlying physics is well understood, or it is difficult or impractical to develop a comprehensive model that captures all of the relevant features.

Topic Areas:
Submissions may include recent advances, challenges, and future directions in PIML model development, but are not limited to, supporting PIML in areas of manufacturing processes, machines, and systems.

- Forward PIML models
- Inverse and data assimilation problems
- Data-driven discovery of physical models
- Neural network architectures for physics
- PIML-based reduced-order models
- Uncertainty quantification and Bayesian optimization
- PIML for process or system optimization
- PIML for machine dynamics
- PIML for quality control
- PIML for predictive maintenance

Publication Target Dates:

1. Paper submission deadline: December 1, 2023
2. Initial review completed: March 1, 2024
3. Publication date: August 1, 2024

Submission Instructions:
Papers should be submitted electronically to the journal at **http://journaltool.asme.org**. If you already have an account, log in as author and select **Submit Paper** at the bottom of the page. If you do not have an account, select **Submissions** and follow the steps. In either case, at the **Paper Submittal** page, select either the **ASME *Journal of Manufacturing Science and Engineering*** and then select the **Special Issue on Physics-Informed Machine Learning for Advanced Manufacturing**. Papers received after the deadline or papers not selected for inclusion in the Special Issue may be accepted for publication in a regular issue.

Guest Editors:
Dr. Yuebin Guo, Rutgers University-New Brunswick, USA, yuebin.guo@rutgers.edu
Dr. Yusuf Altintas, The University of British Columbia, Canada, altintas@mech.ubc.ca
Dr. Qing Chang, University of Virginia, USA, qc9nq@virginia.edu
Dr. Robert Gao, Case Western Reserve University, USA, Robert.Gao@case.edu
Dr. Andy Henderson, Hendtech LLC, USA, andy.henderson@hendtech.com
Dr. Jaydeep Karandikar, Oak Ridge National Lab, USA, karandikarjm@ornl.gov
Dr. Tony Schmitz, University of Tennessee, Knoxville, USA, tony.schmitz@utk.edu