

CALL FOR PAPERS

ASME Journal of Computing and Information Science in Engineering Special Issue on Machine Learning Applications in Manufacturing

Machine Learning (ML) has recently become a power engine transforming various manufacturing research and applications. In the era of Smart Manufacturing and I4.0, the abundance of smart sensors and industrial internet of things, has made manufacturing systems a data-rich environment. ML techniques play a significant role in uncovering fine-grained complex production patterns and offering timely decision support in a wide range of applications, to name a few, robotics and human-machine interaction, predictive maintenance, process optimization, task scheduling, quality improvement, and security. While different ML techniques have been researched and deployed in manufacturing, many open challenges and questions still remain, from data understanding, data and knowledge representation, and data reasoning in ML to advanced topics such as predictive analytics, edge computing and cybersecurity.

This Special Issue aims to harvest the latest efforts in theoretical as well as experimental aspects of ML and their applications in manufacturing.

Potential topics include, but are not limited to:

- ❖ ML-based theoretical approaches for manufacturing
 - ML for robotics and human-machine interaction
 - ML for predictive maintenance, quality control, and process optimization
 - ML for tasks scheduling and supply chain management
 - ML for sustainable manufacturing
 - ML for manufacturing process monitoring and control
 - ML and data-driven design for manufacturing to enable better and faster fabrication of parts
 - ML methods that provide insights for manufacturing process improvement
 - ML methods that leverage material informatics for improved manufacturing
- ❖ ML-based experimental case studies for smart manufacturing
 - Advanced diagnostics, prognostics and asset health management
 - Energy consumption modelling and optimization
 - Advanced robotics (collaborative and adaptive robots)
 - Digital twin
 - Leveraging ML for hybrid manufacturing (additive and subtractive manufacturing)
 - Data acquisition for novel manufacturing processes
- ❖ Novel ML algorithm design for manufacturing
 - Approaches to extract manufacturing knowledge using ML techniques
 - Algorithms and approaches handling big data, data imbalance, uncertainty, data fusion, etc.
 - Calibration and validation of ML-based patterns and models
 - Addressing security, privacy, and cyber resilience/reliability issues
 - Novel deep learning architecture for manufacturing domain problems
 - Hybrid machine learning methods that combine data-driven and equation-based methods
- ❖ Creation and sharing of research data that supports ML applications in manufacturing

We also encourage papers that leverage the specific intersection between manufacturing tasks and ML techniques, with contributions that generalize across multiple manufacturing problems.

Publication Target Dates

Paper Submission Deadline: **July 1, 2019**

Initial Review Completed: **September 30, 2019**

Special Issue Publication Date: **March 2020**

Standard Submission Instructions

Papers should be submitted electronically to the journal at <https://journaltool.asme.org/home/login.cfm>. If you already have an account, log in as author and select **Submit Paper** at the bottom of the page. If you don't have an account, select **Create an Account** and follow the steps to create an account. In either case, at the **Paper Submittal Page**, select the **Journal of Computing and Information Science in Engineering** and then in the Special Issue dropdown menu choose "Machine Learning Applications in Manufacturing". Please also email the Editor, Professor Satyandra K. Gupta, at guptask@usc.edu, to alert him that your paper is intended for the Special Issue. Early submission is highly encouraged.

Papers submitted by July 1, 2019, will be reviewed in time for inclusion in the Special Issue. Papers received after that date may still be considered for the Special Issue, if time and space permits.

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