

CALL FOR PAPERS

IEEE Internet of Things Journal Special Issue on

Human Machine Interaction in Industrial IoT Flexible Manufacturing with Advanced AI Tools: Emerging Application and Challenges

With the explosive growth in Industrial Internet-of-things (IIoT) devices, applications and services have also substantially expanded in recent years. Due to the various market demands and device potentials, flexible manufacturing that can quickly adjust the production scale and product structure according to specified requirements is the new trend. Besides, artificial intelligence (AI) technologies, such as digital twins, machine learning, and natural language processing (NLP), have laid a solid foundation for the advancement of industrial flexible manufacturing. Distributed and heterogeneous features of the IIoT systems require multiple channels to work in a collaborative way to bridge the service/application and device domains, especially human-machine- interaction (HMI). Compared with the traditional IIoT HMI methods for displaying and relaying information, such as machine conditions, output rates, and error signals, the advanced AI tools (ML, NLP, CV) can enhance the interaction capabilities and make it more user-centered, context-aware, adaptive, and intelligent. A variety of questions related to designing and applying new HMI approaches in IIoT flexible manufacturing with advanced AI tools need to be solved, including the control and design of hybrid systems with new interaction methods, design HMI that can meet the diverse and dynamic needs of different users, tasks, and situations in the IIoT flexible manufacturing environments, the security and privacy of the IIoT devices data and applications, error correction and explanation mechanisms for the AI-assisted solutions, and so on.

This special issue intends to encourage high-quality research in IIoT flexible manufacturing, and push the theoretical and practical bound forward for a deeper understanding of architectures, techniques, services/toolkits, and business value. The submitted work should be unpublished technical articles with a substantial novel contribution towards the scope. The topics of interest include, but are not limited to the following:

- Edge/Fog/Cloud Computing in IIoT flexible manufacturing
- Multi-Agent and workflow for the IIoT flexible manufacturing
- Data Analysis with AI in IIoT flexible manufacturing
- Digital twins technologies in IIoT flexible manufacturing
- Service Computing and Recommendation in IIoT flexible manufacturing
- Novel human-machine-interaction approaches in IIoT flexible manufacturing
- Novel QoS Management in IIoT flexible manufacturing
- Security and data privacy in IIoT flexible manufacturing
- Reliability Evaluation and On-line Monitoring in IIoT flexible manufacturing
- Novel Industrial Application Design Systems/Tools in IIoT flexible manufacturing
- Emerging Tools and benchmarks for HMI in IIoT flexible manufacturing

Important Dates

- Manuscript Submission Due: January 31st, 2025
- First Round of Reviews Completed: March 31st, 2025
- Revision Due: April 25th, 2025
- Second Review Due/Notification: May 25st, 2025
- Final Manuscript Due: June 15th, 2025
- Publication Date: August 2025

Submission

The original manuscripts to be submitted need to follow the guidelines described at: <http://ieeiotj.org/guidelinesfor-authors/>, which should not be concurrently submitted for publication in other venues. Authors should submit their manuscripts through the IEEE Manuscript Central at: <https://mc.manuscriptcentral.com/iot>. The authors must select as "SI: Human Machine Interaction in Industrial IoT Flexible Manufacturing with Advanced AI Tools: Emerging Application and Challenges" when they reach the "Article Type" step in the submission process.

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