IEEE Transactions on Cybernetics

CALL FOR PAPERS

for Special Issue on

Industrial Metaverse for Smart Manufacturing

Theme: The metaverse is an iteration of the Internet as a single, universal and immersive virtual world that is facilitated by the use of virtual reality (VR), augmented reality (AR), mixed reality (MR), extended reality (XR), multisensory extended reality, and simulated reality, which is a component of cyber-physical-social systems. Metaverse is a process of virtualization and digitization of the real world by artificial intelligence, blockchain, cloud computing, and digital twins technologies, which has wide applications to video games, tourism, autonomous vehicles, and industries. As a significant component of economy, industry is under the transformation towards intelligent operation, greening and digitalization. For example, the current status of process industry does not meet the demand of this future vision, in which hybrid modeling, autonomous control, dynamic scheduling, intelligent decision-making, security/safety control and predictive maintenance still need further development. Hence, it is urgent to consider the industrial metaverse to promote the upgrading of industry towards intelligent operation, greening and digitalization. For example, since the physical system is geographically distributed, massive data from life cycle required to be analyzed, understood, and then used for optimization of decision-making, security/safety management, and remote maintenance, which is difficult to achieve by traditional technologies. Considering the advantages of metaverse, it is promising to establish industrial metaverse for industrial manufacturing, which covers the life cycle based on industrial Internet, artificial intelligence and other modern information technologies. The inclusion of industrial metaverse will guide the efficient operation of the physical industry, empower all aspects and scenarios of the industry, promote the high-quality development of the industry, and further upgrade the intelligent manufacturing.

The main focus of this special issue will be on the application of industrial metaverse to the industrial manufacturing. The targeted audience includes both academic researchers and industrial practitioners. It is aimed to provide a springboard to facilitate interdisciplinary researches and share most recent developments in various related fields.

This special issue will focus on (but not limited to) the following topics:

Simulated reality-based mechanism of smart manufacturing; Digital twins for smart manufacturing; Human-computer interaction platform of virtual smart manufacturing; Cyber-physical-social systems for digital economy in industry; 3D reconstruction for digital smart manufacturing; Human-computer interaction techniques in smart industry; Intelligent data collection and distributed sensing for smart industry; Metaverse-based carbon footprint monitoring of manufacturing chain; Data-driven optimization in modeling, optimization and decision-making; Digital real-time and networked embedded systems for smart industry; Construction of digital platform for safety management and remote maintenance in smart manufacturing; Collaborative scheduling for digital economy in smart industry; Metaverse-based multi-objective operation and regulation under the constraint of carbon emission; Applications to typical industries like petro-chemical, steel, automobile and nonferrous metal industries.

Manuscript Preparation and Submission

Follow the guidelines in "Information for Authors" in the IEEE Transaction on Cybernetics https://www.ieeesmc.org/publications/transactions-on-cybernetics. Please submit your manuscript in electronic form through Manuscript Central web site: https://mc.manuscriptcentral.com/cyb-ieee. On the submitting page # 1 in popup menu of manuscript type, select: SI on Industrial Metaverse for Smart Manufacturing. Submissions to this special issue must represent original materials that have been neither submitted to, nor published in, any other journal. The review process for the special issue submissions and the paper length requirement are the same as the regular issue papers.

Note: The recommended papers for the special issue are subject to the final approval by the Editor-in-Chief. Some papers may be published in a regular issue, at the EIC discretion. Depending on the number of accepted manuscripts, this special issue could be published as a special section in a regular issue.

Timetable:	**Paper submission:**	**January 31, 2023**
	Completion of first round of review:	**April 30, 2023**
	Completion of final review:	**September 30, 2023**
	Submission of final manuscripts:	**October 31, 2023**
	Scheduled publication:	**December 31, 2023**

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