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Special Issue on Extended Reality in Design and Manufacturing

Extended Reality (XR) is a collective term containing Virtual Reality (VR), Augmented Reality (AR), Mixed Reality (MR), and everything in between. VR is a fully immersive technology in which users interact with a 3D virtual environment generated by computer graphics. AR enhances user's situational awareness by overlaying relevant virtual content onto a real scene. MR is a step beyond AR by combining physical reality with digital content in a way that enables real-time interaction with and among real and virtual elements. XR has proven to be an effective communication medium for human beings to instantly interact with other entities in shared hybrid spaces. It thus enables human-centric approaches for performing tasks with an enhanced sense of immersion, presence, and ambient intelligence.

Integrated with emerging technologies such as artificial intelligence (AI), 5G, and industrial internet-of-things (IIoT), XR applications have been successfully deployed in the fields of industry, entertainment, education, and healthcare. The purpose of this Special Issue is to solicit articles describing fundamental and applied research on XR techniques, solutions, and challenges in the areas of design and manufacturing. This Special Issue covers all aspects of XR technology related to mechanical engineering. Computing methodologies, algorithms, technical advances in software/hardware, ergonomic analysis, critical reviews, and novel empirical studies for product design and manufacturing processes are particularly welcome. Topics of interest include, but are not limited to:

Topic Areas

- XR applications in human-robot collaboration
- XR applications in Industry 4.0/Industry 5.0
- XR applications in cyber-physical systems/engineering digital twins
- XR applications in product, process, service, and industrial design
- XR applications in engineering training, design education, innovation, and ideation
- VR/AR/MR integration and realization of the metaverse
- Methods for spatial reasoning, object recognition, 3D tracking, visualization in XR
- Integration with IIoT, AI, machine learning, cloud/edge computing, 5G, multi-modal sensor fusion
- Interoperability and industrial standards
- Communication and collaboration in multi-user XR spaces
- Usability, user experience, competence and performance assessment of XR systems
- Physiological and psychological impacts of XR systems

Publication Target Dates

Paper submission deadline	February 15, 2023
Review completed	June 15, 2023
Special Issue publication date	December 2023

Submission Instructions

Papers should be submitted electronically to the journal at journaltool.asme.org. If you already have an account, log in as an author to your ASME account. If you do not have an account, sign up for an account. In either case, at the **Paper Submittal** page, select the [*ASME Journal of Computing and Information Science in Engineering*](#) and then select the Special Issue **Extended Reality in Design and 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. Early submission is highly encouraged. Please also email the Editor, Professor Yan Wang, at yan.wang@me.gatech.edu, to alert him that your paper is intended for the Special Issue.

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