



ACM Transactions on Sensor Networks

Special Issue on Computing, Sensing, and Networking for Immersive Systems

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Immersive computing systems, which comprise a diverse array of emerging technologies, including augmented reality (AR), virtual reality (VR), mixed reality (MR), and the metaverse, have evolved rapidly in recent years. This fast-growing technique trend introduces a significant paradigm shift in the realm of human-computer interaction, offering unprecedented opportunities that can seamlessly integrate virtual and digital content into our physical worlds. Specifically, by leveraging a wide range of sensory modalities (e.g., audio, visual, motion, and thermal), immersive computing systems effectively capture human-centric and environmental contexts and digitize them to provide immersive experiences to the users. Immersive computing holds promise for revolutionizing various sectors such as education, healthcare, manufacturing, entertainment, and beyond. Yet, the development of future immersive computing systems capable of delivering seamless, collaborative, reliable, and prolonged immersive experiences present a significant challenge. Therefore, addressing these challenges necessitates interdisciplinary research efforts aimed at clearing the path for the future widespread adoption of immersive computing technologies.

This special issue aims to bring together a diverse community of researchers, engineers, and practitioners of immersive computing systems from academia, industry, and government sectors. The primary goal is to foster vibrant discussions around cutting-edge research and latest perspectives in the realm of immersive computing systems. We invite submissions of original research and innovative developments that push the boundaries of immersive computing systems, such as advancements in AR, VR, MR, spatial computing, and the evolving metaverse landscape. Contributions that shed light on new research challenges associated with immersive computing systems, offer insights into existing solutions, or propose forward-thinking approaches to ongoing challenges of immersive computing systems are particularly encouraged.

Topics

All topics relevant to and advancing immersive computing systems are of interest. Topics of interests include, but are not limited to, the following:

- Human-centric context sensing, such as gaze tracking, cognitive context, and expression recognition, on AR/VR/MR platforms.
- Multi-sensor fusion on head-mounted devices.
- Novel sensing modalities for AR/VR/MR.
- Locomotion, localization, and navigation techniques.
- User experience and usability study of real-world immersive computing systems.
- Applications of immersive computing in industry, healthcare, education, manufacturing, entertainment, art, architecture, and beyond.
- Novel interaction methods, such as touch, tangible and gesture interfaces, for immersive computing systems.
- Algorithms, theories, tools, and testbeds for immersive systems.

- Innovative approaches that address the communication and networking challenges for immersive systems.
- Efficient visual sensing for augmentation and visualization.
- Generative AI for immersive systems and applications.
- Resource-efficient rendering for mobile immersive systems.
- Immersive content delivery for mobile AR/VR/MR systems.
- Scalability and heterogeneity of multi-user XR and the metaverse.
- Security and privacy in AR/VR/MR.
- Ethics and social implications of immersive computing technologies.
- Collaborative computing among AR/VR/MR and other mobile devices.

Important Dates

- Submissions deadline: September 30, 2024
- First-round review decisions: November 30, 2024
- Deadline for revision submissions: January 31, 2025
- Notification of final decisions: February 28, 2025
- Tentative publication: mid 2025

Submission Information

Submissions to this special issue will be reviewed by the special Issue Editors to ensure the quality standards of ACM Transactions on Sensor Networks (TOSN). Papers that do not pass this initial screening will be immediately returned. Reviewers will apply those standards in forming recommendations for acceptance, revision, or rejection. Papers should be formatted with TOSN style (<https://dl.acm.org/journal/tosn/author-guidelines>). Prospective contributors should submit their papers directly to the online submission system (<https://mc.manuscriptcentral.com/tosn>). Authors please choose the special Issue on "SI: Computing, Sensing and Networking for Immersive Systems" in the online submission.

For questions and further information, please contact **the editorial team via tosnImmersive@hotmail.com**.