Special Issue

Multimodal Sensing and Learning for Wearable Systems: Challenges, Methods, and Applications

Message from the Guest Editors

Wearable systems are increasingly used in healthcare, fitness, rehabilitation, sports, and industrial applications, driven by advances in sensor technologies, wireless communication, and artificial intelligence. Integrating multiple sensing modalities—such as inertial measurement units (IMUs), physiological sensors, cameras, and microphones—enables richer context understanding, improved recognition accuracy, and more robust performance under diverse conditions. However, multimodal wearable systems face notable challenges, including heterogeneous data alignment, missing modality handling, energy-efficient processing, and privacy protection. This Special Issue invites original research and review articles that explore novel methods, algorithms, architectures, and applications for multimodal wearable systems. Contributions may address sensor fusion techniques, personalized and adaptive models, privacy-preserving approaches, and generative modeling for data augmentation. By gathering interdisciplinary work, this Special Issue aims to accelerate innovation and practical deployment of intelligent, context-aware wearable technologies.

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Sensors is a leading journal devoted to fast publication of the latest achievements of technological developments and scientific research in the huge area of physical, chemical and biochemical sensors, including remote sensing and sensor networks. Both experimental and theoretical papers are published, including all aspects of sensor design, technology, proof of concept and application. Sensors organizes Special Issues devoted to specific sensing areas and applications each year.

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