Special Issue

Infrared Image Processing with Artificial Intelligence: Progress and Challenges

Message from the Guest Editors

Infrared (IR) imaging has become an indispensable tool in a wide range of domains, including surveillance, remote sensing, medical diagnostics, autonomous driving, industrial inspection, and environmental monitoring. Unlike visible-spectrum imaging, infrared captures thermal radiation, offering unique advantages in low-light and obscured environments. However, IR image processing poses distinct challenges, such as low contrast, limited texture, noise, and variability in environmental conditions.

Recent advances in artificial intelligence (AI)—particularly deep learning—have led to significant breakthroughs in addressing these challenges. AI-powered methods now play a crucial role in tasks such as image enhancement, object detection and tracking, semantic segmentation, anomaly detection, and multimodal fusion involving IR data. Despite these advances, the field continues to face various obstacles, including limited labeled data, high domain variability, a lack of generalization, and the need for interpretable and energy-efficient models.

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Message from the Editor-in-Chief

The imaging term, specific with journal, is to be considered in its broadest sense. Image processing, image understanding and computer vision are all terms related to imaging acquisition, its processing and the extraction of relevant information from the scene to obtain the underlying knowledge. All tasks related to the above items are oriented toward specific applications in a broad range of areas and topics. The *Journal of Imaging* is conceived as an efficient vehicle in the scientific community for the communication and transmission of the progress and research results in the topics covered.

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