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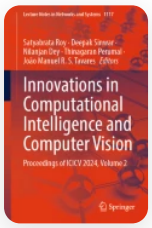

Innovations in Computational Intelligence and Computer Vision

(ICICV 2024)

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Abstract

The field of cross-spectral imaging has significantly advanced, driven by its diverse applications, including environmental monitoring and medical imaging enhancements.

The integration of images from different parts of the electromagnetic spectrum, particularly the fusion of thermal and visible images, is a crucial task for different applications. It provides a comprehensive picture of a scene, combining the clarity of visible light imaging with the contrast of thermal imaging. This research investigates the efficiency of various techniques and architectures for local feature matching between visible and thermal images, essential for accurate image registration. Through evaluating a wide array of methods against a novel acquired cross-spectral dataset encompassing varied real-world scenarios, the study provides detailed insights into their effectiveness and limitations under different conditions. It also presents quantitative benchmarks on computational speed, offering a clearer perspective on each method's performance and applicability in practical, especially resource-constrained, settings. The results indicate that these architectures exhibit remarkable capabilities in accurately and efficiently registering images from the thermal and visible domains. Their inherent flexibility in handling complex problems, along with their computational speed, suggests that these approaches hold significant promise for addressing cross-spectral imaging challenges. The dataset is available at:https://github.com/vision-cidis/CIDIS-dataset.

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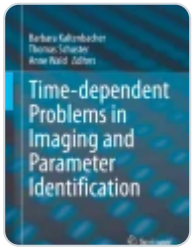

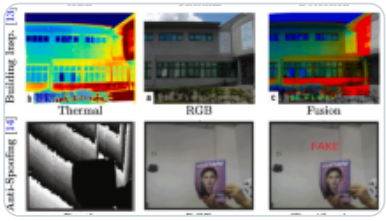

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