

ADAPTIVE SHEARLET-BASED IMAGE FUSION WITH ENHANCED VISUAL CLARITY FOR MULTIFOCUS APPLICATIONS

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This study proposes an adaptive image fusion technique that leverages shearlet-inspired directional enhancement, contrast optimization, and sharpening procedures to effectively combine complementary information from multiple images. By using gradient-based edge enhancement and adaptive block-wise fusion guided by sharpness measures, the method ensures enhanced detail preservation. Subsequent multi-scale contrast improvement and final sharpening yield high-quality fused images. Experimental evaluations across multiple datasets demonstrate superior visual fidelity, contrast, and sharpness compared to existing methods, highlighting its suitability for medical imaging, remote sensing, and computational photography applications.