

## 基于 NSST 和 SLIC 的多聚焦图像融合算法

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**摘 要:** 为了解决多聚焦图像融合方法中局部图像细节不清晰的问题以及提高聚焦区域的准确性, 提出一种将非下采样剪切波变换(NSST)与超像素分割方法中的简单线性迭法(SLIC)相结合的多聚焦图像融合算法.该算法的主要思想是利用 NSST 对源图像做多尺度和多方向的分解, 然后用 SLIC 分割法以及区域梯度分别对高频和低频系数进行融合.超像素可以保留图像的局部细节特征而且可以很好地保持目标边缘信息, 将 SLIC 用于高频系数的融合可以提升融合图像的清晰度.实验表明该算法在主观视觉效果和客观评价指标上都取得了良好的效果.

**关键词:** 图像融合; 多聚焦图像; 超像素分割; 非下采样剪切波变换 (NSST)

## Fusion Technique for Multi-Focus Images Based on Non-subsampled

## Shearlet Transform and Simple Linear Iterative Clustering

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**Abstract:** In order to avoid the local unclear image details of the multi-focus image fusion method, a novel multi-focus image fusion algorithm is proposed, which combines the non-subsampled shearlet transform (NSST) with the simple linear iterative method (SLIC) that belongs to super pixels segmentation method. The main idea of this algorithm is to use NSST decomposition to get the multi-scale and multi-direction image of the source image, then the high frequency and low frequency coefficients are fused by the SLIC segmentation method and the regional gradient. Super pixel can preserve the local details of the image and can effectively maintain the target edge information, the SLIC application in the high frequency coefficient of fusion can enhance the resolution of the image. Experimental results demonstrate that the fused image based on the proposed technique has much clearer visual performance, more reasonable objective metric results.

**Key words:** image fusion; multi-focus images; super-pixel segmentation; non-subsampled shearlet transform (NSST)

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