

图形、图像、模式识别

基于Curvelet变换的红外与彩色可见光图像融合算法

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摘要 提出了基于二代Curvelet变换的红外与彩色可见光图像的融合算法。首先对彩色可见光图像进行IV1V2颜色空间变换提取亮度分量, 然后对彩色图像的亮度分量和红外图像应用Curvelet变换, 对低频系数应用亮度重映射技术后采用加权平均的融合规则, 高频系数则采用取大融合规则, 再对融合系数应用Curvelet逆变换获得融合图像的亮度分量, 最后运用颜色空间逆变换得到融合图像。实验对比表明, 相对于对传统融合算法中强度较高的源图像会淹没另一方背景纹理及细节的问题, 该算法能有效提高红外光谱信息的充分融合, 获得了视觉效果更好、综合指标更优的融合图像。

关键词 [图像融合](#) [Curvelet变换](#) [亮度重映射](#) [红外图像](#) [可见光彩色图像](#)

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Infrared and color visible image fusion algorithm using Curvelet transform

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Abstract

A novel fusion algorithm based on the second-generation Curvelet transform for infrared image and color visible image is proposed. In this paper, color visible image is converted from RGB color space to IV1V2 and its intensity component is extracted, as well as apply Curvelet transform to the intensity component and infrared image. In the progress, luminance remapping techniques is used to remap curvelet low-frequency coefficient before they are fused in weighted average rule, and picking large value rule is used to fuse high-frequency coefficients, and Curvelet inverse transform is used to fusion coefficients obtaining fused Intensity component. Furthermore, the color space inverse convert is used to obtain fused images. The experiment result shows that the proposed algorithm can overcome the problem in traditional image fusion algorithm, where one source image has higher intensity which may cover the other background texture and detail features. And the algorithm can improve fusion of infrared image spectral information, also has more comprehensive evaluation and better visual effects.

Key words [image fusion](#) [Curvelet transform](#) [luminance remapping](#) [infrared image](#) [color visible image](#)

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