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论文

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基于改进LP变换及自适应PCNN的多聚焦图像融合方法

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Multifocus image fusion method based on improved LP and adaptive PCNN

摘要

图/表

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摘要

提出一种抗噪声多聚焦图像融合方法。首先,采用改进拉普拉斯金字塔(LP)变换构造图像的塔形数据结构,每层数据经脉冲耦合神经网络(PCNN)迭代运算生成相应的点火次数矩阵;然后,以此为依据经判决算子完成数据融合;最后,采用伪逆重构算法生成融合图像。实验结果表明,所提出的方法具有抗加性噪声及JPEG压缩系统噪声的能力,融合图像的客观评价指标较高,且能有效减弱原LP算法融合图像边缘的“Gibbs”伪影现象。

关键词: 图像融合, 拉普拉斯金字塔变换, 脉冲耦合神经网络(PCNN), 抗噪声性能

Abstract :

Based on Laplacian pyramid(LP) transform and the pulse coupled neural network(PCNN), a multifocus image fusion algorithm with antinoise properties is proposed. Firstly, the improved LP transform is adopted to construct the pyramidal data of image, the data are inputted into adaptive PCNN, and through the iterative operation by the PCNN, the firing time matrixes of them can be obtained. Then these matrixes and the pyramidal data are used by the decision operator for data fusion. Finally, the fused pyramidal data are reconstructed by using the pseudo inverse to obtain the fused image. The experimental results show that the proposed algorithm has antinoise properties for additive noise and system noise from JPEG compression, and can efficiently reduce the “pseudo Gibbs” phenomenon which is inevitable in the fused image by using the traditional LP algorithm.

Key words: Image Fusion Laplacian Pyramid Transform Pulse Coupled Neural Networks Antinoise Properties

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