

基于二维局域均值分解的自适应图像处理算法

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摘要: 本文借鉴具有自适应特性的一维局域均值分解算法(Local Mean Decomposition, BLMD), 提出了二维局域均值分解算法(Bidimensional Local Mean Decomposition, BLMD). 二维局域均值分解算法可以将源图像分解成多个二维生产函数分量(Bidimensional Product Function, BPF). 思路为: 先通过可变邻域窗法来获得分解过程中的极值点, 而后利用分形理论对图像进行插值操作, 并得到相应的均值曲面的等信息, 再对筛分过程中相邻曲面之间在零值平面投影上不重合极值点数目进行统计和分析, 给出符合图像本身特性的停止条件, 保证分解得到的 BPF 分量能够真实反映图像的某类特征信息. 最后, 在此基础上形成本文提出的二维局域均值分解算法. 通过实证分析表明, 本方法可以自适应对图像进行分解.

关键词: 二维经验模式分解; 局域均值分解; 二维局域均值分解; 分形插值; 停止条件

Adaptive image processing algorithm based on bi-dimensional local mean decomposition

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Abstract: In this paper, a Bi-dimensional Local Mean Decomposition (BLMD) algorithm with adaptive characteristics is proposed. The two-dimensional local mean decomposition algorithm can decompose the source image into multiple bi-dimensional production function components (BPF). The basic idea is to first obtain the extreme points in the decomposition process by the variable neighborhood window method, and then use the fractal theory to interpolate the image. And get the corresponding information of the mean surface. Then, the number of non-coincident extreme points on the zero-value plane projection between adjacent surfaces in the sieving process is statistically analyzed and analyzed, and the stopping condition corresponding to the characteristics of the image is given. It ensures that the BPF component obtained by the decomposition can truly reflect certain types of feature information of the image. Finally, it forms the two-dimensional local mean decomposition algorithm proposed in this paper. The empirical analysis shows that the method can adaptively decompose the image.

Key words: Bi-dimensional empirical mode decomposition; local Mean decomposition; B-idimensional local mean decomposition; fractal interpolation; stop condition

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