

论文与报告

基于2DPCA的有效非局部滤波方法

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摘要

最近, 非局部滤波方法已成为滤波领域的研究热点. 本文深入研究了基于预选择的非局部滤波方法, 指出了已有方法在提取图像片特征方面存在的不足, 利用二维主成分分析(Two-dimensional principal component analysis, 2DPCA)提出了一种有效的非局部滤波方法. 该方法对基于预选择的非局部滤波方法的主要贡献有: 1)用于提取图像片特征的面向图像片的2DPCA; 2)基于相似距离直方图的相似集自动选取方法; 3)相似距离权重参数局部自适应选取方法. 实验结果表明, 本文方法对弱梯度、人脸、纹理以及分段光滑图像均能取得较好的滤波效果.

关键词 [非局部滤波](#) [二维主成分分析](#) [非局部正则化](#) [图像片](#)

分类号

An Efficient 2DPCA-based Non-local Means Filter

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Abstract

Recently, the non-local means filter has been a hot research topic in the image filtering field. The existing preselection based non-local means filters are analyzed intensively, and it is pointed out that they all have defects in terms of feature extraction from image patch. We employ two-dimensional principal component analysis (2DPCA) to extract feature from image patch and propose an efficient non-local means filter. Our contributions to the preselection based non-local means filter are: 1) patch-oriented 2DPCA for extracting features from image patches; 2) automatic selection of the similar sets based on the histogram of similarity distance; 3) local adaptive determination of the similar weight coefficient parameter. Experimental results show that the new method can achieve better filtering results in a variety of images, such as weak gradient image, face image, texture image, and piecewise image.

Key words [Non-local means filter \(NLMF\)](#) [two-dimensional principal component analysis \(2DPCA\)](#) [non-local regularization](#) [image patch](#)

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