

博士论坛

分数阶图像去噪变分模型及投影算法

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摘要 在图像去噪同时保持图像的纹理等细节是非常重要的。首先利用分数阶导数定义了新的分数阶有界变差函数空间, 然后利用分数阶有界变差空间及负指数Sobolev空间, 提出了分数阶变分图像去噪模型, 最后提出了求解分数阶变分模型的投影算法并证明了算法的收敛性。实验结果表明, 分数阶变分模型在提高峰值信噪比和保持图像纹理细节两个方面都非常有效。

关键词 [图像去噪](#) [分数阶微分](#) [纹理](#) [峰值信噪比](#)

分类号

Fractional variational model and projection algorithm for image denoising

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Abstract

It is important to preserve fine scale features such as texture in the process of image denoising. In this paper, a new space of functions of fractional bounded variation is defined. Based on the new space of functions of fractional bounded variation and the negative Sobolev space, a fractional variational model for image denoising and the project algorithm for solving the model are proposed. The convergence of the algorithm has been proved in this paper also. The numerical results show that the fractional variational model are very effective in improving the peak signal to noise ratio of noisy image and preserving more fine scale features in the process of denoising.

Key words [image denoising](#) [fractional derivative](#) [texture](#) [Peak Signal to Noise Ratio \(PSNR\)](#)

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