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Fuzzy Based Fast Non Local Mean Filter to Denoise Rician Noise

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Abstract

In this paper, a new Fuzzy based Fast Non Local Mean algorithm is proposed to denoise Rician noise from MRI images. Initially, Fuzzy function used to find the similar and non-similar pixel. After this, Non Local Mean(NLM) algorithm with integral image representation is used to find the weights of similar pixel at a faster rate than the normal NLM algorithm in the image. Consequently these similar pixels are used to generate the noise free pixels. At the end the conventional bias subtraction method is used as post processing step. The proposed scheme is tested with real data set and compared with existing Fast NLM techniques and basic NLM using Root mean square error(RMSE), peak signal noise ratio (PSNR), Structure similar index (SSIM), quality index and computational time parameters methods. The proposed method gave better result than existing Fast NLM technique with high and density Rician noise in the image and it is Fast than NLM.

Keywords

- Image denoising
- Fuzzy Based Non Local Mean
- Rician Noise