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Non-Local Blockwise Implementation Method with Selective Features for Speckle Image Denoising.

Speckle noise occurs in a wide range of medical images due to sampling and digital degradation. Understanding how noise can be present in images have led to multiple denoising techniques. Most of these denoising techniques assume equal noise distribution. When the noise present in the image is not uniform, the resulting denoised image becomes of less than the highest standard or quality. The Non-local means (NLM) filter restores every pixel in the original image by computing a weighted average of non-local neighborhoods using a robust similarity measure. The NLM algorithm takes advantage of the high degree of redundancy of any natural image. Also, the NLM algorithm is very accurate since all pixels contribute for denoising at any given pixel. However, due to nonlocal averaging, one major drawback is computational cost. For this research, we will discuss new denoising techniques based on non-local means for images contaminated by speckle noise. We introduce blockwise and selective denoising methods based on NLM technique to enhance computational efficiency. Our numerical results show that the new methods are more efficient than the conventional NLM method. (Received September 17, 2019)