ABSTRACT

The need for image restoration is encountered in many practical applications. For instance, distortion due to Additive White Gaussian Noise (AWGN) or in some cases the multiplicative (speckle) one can be caused by poor quality image acquisition. Wavelet denoising attempts to remove these types of noise present in the signal while preserving the signal characteristics, regardless of its frequency content. A newly developed method based on the wavelet transform (semi-soft thresholding) appears promising, though there is little practical guidance on its use. The results that are obtained by the experiments are compared with traditional additive noise methods such as Sureshrink, Block Method 3 Dimensions (BM3D) and Speckle noise reduction methods as Lee filter, linear scaling filter (Lsmv). Furthermore, Cycle Spinning technique is implemented in order to enhance the quality of the denoised estimates. It has been found that the proposed method achieves better enhancement and restoration of the image while preserving high frequency features of the noiseless image. Moreover, the proposed algorithm matches the quality of the best redundant approaches, while maintaining a high computational efficiency and a low CPU/memory consumption.

Keyword: Additive noise; Speckle noise; Wavelet; BM3D; Cycle spinning