

Review of image denoising algorithms based on the wavelet transformation

ABSTRACT

The search for efficient image denoising methods is still a valid challenge at the crossing of functional analysis and statistics. In spite of the sophistication of the recently methods, most algorithms have not yet attained a desirable level of applicability. All the algorithms show a high outstanding Performance when the image model corresponds to the algorithm assumptions but it fails in general and create artifacts or change the main structures of the original image. Denoising of natural images corrupted by white Gaussian noise using wavelet techniques is very effective because of its ability to capture the energy of the signal in few energy transform values or coefficients. This method performs well under a number of applications because wavelet transform has the compaction property of having only a small number of large coefficients where the remaining wavelet coefficients are very small. The aim of this review paper is to examine all existing studies in the literature related to applying wavelet transformation for denoising images. However, to review various denoising algorithms using wavelet transform; those algorithms are discussed and showed how the appearance and quality of the noisy image can be improved. Algorithms such as SUREShrink, VisuShrink, BayesShrink, Bivariate shrink, Neigh Shrink and Normal shrink are presented in this paper. In the part of the experimental results, different Gaussian white noise levels in PSNR are shown.

Keyword: Denoising; Discrete wavelet transforms (DWT); Hard and soft thresholding; Peak signal to noise ratio (PSNR)