In this paper a hybrid denoising algorithm which combines spatial domain bilateral filter and hybrid thresholding function in the wavelet domain is proposed. The wavelet transform is used to decompose the noisy image into its different subbands namely LL, LH, HL, and HH. A two stage spatial bilateral filter is applied. The first stage is applied on the noisy image before wavelet decomposition. This stage will be called a pre-processing stage. The second stage spatial bilateral filtering is applied on the low frequency subband of the decomposed noisy image namely subband LL. This stage will tend to cancel or at least attenuate any residual low frequency noise components. The intermediate stage deal with high frequency noise components by thresholding detail subbands LH, HL, and HH using hybrid thresholding function. The experimental results show that the performance of the proposed denoising algorithm is superior to that of the conventional denoising approach.
Image Denoising based on Spatial/Wavelet Filter using Hybrid Thresholding Function


Index Terms

Computer Science  Signal Processing
Keywords
Image Denoising  Spatial Bilateral Filter  Thresholding Function