Abstract

Several noise removal techniques have proven their worth in image processing applications. After an overview of some image denoising approaches, we introduce a LMMSE-based denoising technique with wavelet multiscale model and wiener filter in spatial domain. This proposed denoising technique stands out prominent in terms of SNR, MSE and PSNR compared to some more denoising techniques (also proposed in this paper). The Overcomplete Wavelet Expansion (OWE) which is also employed, provides better result compared to Orthogonal Wavelet Transform (OWT). Moreover, some fine details of the image such as edges, curves etc. is preserved using the LMMSE rule.

References

- I. Pitas and A. N. Venetsanopoulos, "Nonlinear Digital Filters: Principles and

**Index Terms**

Computer Science  
Signal Processing

**Keywords**

Denoising  
Discrete Wavelet Transform (dwt)  
Wiener Filter  
Overcomplete Wavelet Expansion (owe)  
Lmmse  
Square Error (mse)  
And Peak Signal To Noise Ratio (psnr)