Abstract

The widespread usage of ultrasound imaging equipment necessitates the need for better image processing techniques to offer a clearer image to the medical practitioner. This makes the use of efficient despeckle filtering a very important task. The speckle is most often considered a dominant source of multiplicative noise in ultrasound imaging and should be
filtered out without affecting important features of the image. The objective of the paper is to compare performance of the multiscale methods, namely, wavelet transform, Laplacian pyramid transform and contourlet transform for despeckling medical ultrasound images. The effects of different thresholding techniques using Bayes shrinkage rule for denoising ultrasound images are examined. The despeckled image quality is evaluated using filter assessment parameters like variance, Mean-Square Error (MSE), Signal to Noise Ratio (SNR), Peak Signal to Noise Ratio (PSNR) and Correlation Coefficient (CC). The performance comparison of multi-scale schemes shows that contourlet transform based despeckling method excels over the other two transform based despeckling methods. Extensive experimentation has been carried out for comparative analysis of performance of the methods.

Reference

Performance Comparison of Wavelet Transform and Contourlet Transform based methods for Despeckling Medical Ultrasound Images


Index Terms
Computer Science
Signal Processing

Key words
Despeckling
Wavelet transform
Contourlet transform
Laplacian pyramid transform