

EFFECTIVE MULTISCALE SPECKLE NOISE SUPPRESSION IN KIDNEY ULTRASOUND IMAGES

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Abstract

Due to the characteristic speckle noise of ultrasound kidney images, a noise reducing filter must be first applied before image processing stage like segmentation, registration etc. In addition the speckle suppression methods are highly required to improve the quality of the ultrasound image in retaining the edge features of the kidney images. The effect of this stage increases the dynamic range of gray levels which in turn increase the image contrast.

The proposed system develops a multi-scale wavelet based Bayesian speckle suppression method for ultrasound kidney images. The logarithmic transform of the original image is analyzed into the multi-scale wavelet domain. The subband decompositions of ultrasound images have significantly non-Gaussian statistics that are best described by families of heavy-tailed distributions. Bayesian estimators are designed to exploits these statistics.

Comparison evaluation of the proposed technique is done with the current state-of-the-art soft and hard threshold methods applied on actual ultrasound kidney original and speckle images. With the evaluation parameters of signal error ration and mean signal error the proposed technique is fine tuned to achieve better performance.

Keywords: Kidney Ultrasound Images- Denoising – Multiscale – Speckle suppression.