

Denoising Medical Ultrasound Images and Error Estimate by Cellular Neural Networks and Translation Invariant Wavelets

R. BOUCHOUAREB and D. BENATIA

University of Batna, Faculty of Engineering Sciences, Department of Electronic, Batna, ALGERIA

Abstract: Speckle Noise is a natural characteristic of medical ultrasound images. It is a term used for the granular form that appears in B-Scan and can be considered as a kind of multiplicative noise. Speckle Noise reduces the ability of an observer to distinguish fine details in diagnostic testing. It also limits the effective implementation of image processing such as edge detection, segmentation and volume rendering in 3 D. Therefore; treatment methods of speckle noise were sought to improve the image quality and to increase the capacity of diagnostic medical ultrasound images. Such as median filters, Wiener and linear filters (Persona & Mali, SRAD ...). The first method used in this work is newly invented by Chua & Yang called Cellular Neural Networks (CNN), the second method is 2-D translation invariant forward wavelet transform, both are used in image processing, including noise reduction applications in medical imaging.

Keywords- wavelets transform, image processing, ultrasound image, cellular neural network, filtering.