

Hybrid Thresholding Lifting Dual Tree Complex Wavelet Transform with Wiener Filter for Quality Assurance of Medical Image

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Abstract : The main problem in the area of medical imaging has been image denoising. The most defying for image denoising is to secure data carrying structures like surfaces and edges in order to achieve good visual quality. Different algorithms with different denoising performances have been proposed in previous decades. More recently, models focused on deep learning have shown a great promise to outperform all traditional approaches. However, these techniques are limited to the necessity of large sample size training and high computational costs. This research proposes a denoising approach basing on LDTCWT (Lifting Dual Tree Complex Wavelet Transform) using Hybrid Thresholding with Wiener filter to enhance the quality image. This research describes the LDTCWT as a type of lifting wavelets remodeling that produce complex coefficients by employing a dual tree of lifting wavelets filters to get its real part and imaginary part. Permits the remodel to produce approximate shift invariance, directionally selective filters and reduces the computation time (properties lacking within the classical wavelets transform). To develop this approach, a hybrid thresholding function is modeled by integrating the Wiener filter into the thresholding function.

Keywords : lifting wavelet transform, image denoising, dual tree complex wavelet transform, wavelet shrinkage, wiener filter

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