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Empirical Mode Decomposition Based Denoising by Customized Thresholding

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Abstract : This paper presents a denoising method called EMD-Custom that was based on Empirical Mode Decomposition (EMD) and the modified Customized Thresholding Function (Custom) algorithms. EMD was applied to decompose adaptively a noisy signal into intrinsic mode functions (IMFs). Then, all the noisy IMFs got threshold by applying the presented thresholding function to suppress noise and to improve the signal to noise ratio (SNR). The method was tested on simulated data and real ECG signal, and the results were compared to the EMD-Based signal denoising methods using the soft and hard thresholding. The results showed the superior performance of the proposed EMD-Custom denoising over the traditional approach. The performances were evaluated in terms of SNR in dB, and Mean Square Error (MSE).

Keywords : customized thresholding, ECG signal, EMD, hard thresholding, soft-thresholding
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