

A comprehensive performance analysis of EEMD-BLMS and DWT-NN hybrid algorithms for ECG denoising - DTU Orbit (08/11/2017)

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Electrocardiogram (ECG) is a widely used non-invasive method to study the rhythmic activity of the heart. These signals, however, are often obscured by artifacts/noises from various sources and mini-mization of these artifacts is of paramount importance for detecting anomalies. This paper presents a thorough analysis of the performance of two hybrid signal processing schemes ((i) Ensemble Empirical Mode Decomposition (EEMD) based method in conjunction with the Block Least Mean Square (BLMS) adaptive algorithm (EEMD-BLMS), and (ii) Discrete Wavelet Transform (DWT) combined with the Neural Network (NN), named the Wavelet NN (WNN)) for denoising the ECG signals. These methods are compared to the conventional EMD (C-EMD), C-EEMD, EEMD-LMS as well as the DWT thresholding (DWT-Th) based methods through extensive simulation studies on real as well as noise corrupted ECG signals. Results clearly show the superiority of the proposed methods.

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