

Robust Approach of De-noising ECG Signal Using Multi-Resolution Wavelet Transform

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Abstract:

The ECG signal expresses the behavior of human heart against time. The analysis of this signal performs great information for diagnosing different cardiac diseases. In other hand, the ECG signal used for analyzing must be clean from any type of noises that corrupted it by the external environment. In this paper, a new approach of ECG signal noise reduction is proposed to minimize noise from all parts of ECG signal and maintains main characteristics of ECG signal with lowest changes. The new approach applies simple scaling down operation on the detail resolution in the wavelet transform space of noisy signal. The proposed noise reduction approach is validated by some ECG records from MIT-BIH database. Also, the performance of the proposed approach is evaluated graphically using different SNR levels and some standard metrics. The results improve the ability of the proposed approach to reduce noise from the ECG signal with high accuracy in comparison to the existing methods of noise reduction.