Abstract

ECG signal is one of the important signal that contains the details of heart rhythm. So, the signal must be free of noise information. As many important decisions about health are taken based on ECG signal. So, our aim is to try to find an efficient method to remove noise from filtering techniques.

To find an efficient method for ECG Signal Analysis which is simple and has good accuracy and less computation time. The initial task for efficient analysis is the removal of noise. It actually involves the extraction of the required cardiac components by rejecting the background noise. Enhancement of signal is achieved by the use of Empirical Mode Decomposition method. The use of EMD was inspired by its adaptive nature. The second task is that of R peak detection which is achieved by the use of Continuous Wavelet Transform. Efficiency of the method is measured in terms of detection error rate. Various other methods of R peak detection like Hilbert Transform and Difference Operation Method are implemented and the results when compared with the Continuous Wavelet Transform prove that CWT is a better method.

The simulation is done in MATLAB environment. The experiments are carried out on MIT-BIH database. The results show that our proposed method is very effective and an efficient method for fast computation of R peak detection.

Keywords: ECG signal, filtering techniques, MSE, noise removal techniques, EMD.

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