

ABSTRACT

ECG telemonitoring system has been developed into a small-portable size like a Pocket PC so the patients can monitor their heart condition by themselves. Today, Electrocardiogram (ECG) plays an important role in Human Computer Interface (HCI), diagnosing heart disease and assessing human emotional conditions. In general, the ECG signal is influenced by the power line interference, Electrode contact noise, motion artifacts / Baseline wandering, EMG noise, and Instrumentation noise. To maintain the morphology of the ECG signal, several ways of preprocessing methods have been adopted in several studies. This study applied algorithms to reduce the interferences affecting the ECG signal. They were Discrete Wavelet Transform (DWT)-based wavelet detrend and wavelet denoising using thresholding techniques. The thresholding technique was soft thresholding; this was to remove the three main disturbing sources of the ECG signal, namely baseline wandering, power line interference and high frequency noises during data acquisition, using wavelet functions (" Haar " , " db02 " , " db03 " , " db04 " and " db06 ") on the level of decomposition (" 1 " , " 2 " , and " 3 ").

The best performance of the wavelet was obtained by testing each wavelet and comparing the results of the MSE. The wavelet with the best MSE was then implemented in "Wavelet Based Design and Implementation of Electrocardiograph (ECG) Telemonitoring System with Noise Reduction". The results of the experiments showed that Wavelet "Haar" produced the optimum MSE score.

Keywords: Telemedicine Portable Unit, Base Unit, Noise Reduction, Wavelet and Telemonitoring Systems