

ABSTRACT

Electrocardiogram (ECG) is a signal resulted by heart muscle electric activity by put electrodes to the body. ECG recordings were used by the specialist to determine the patient's heart condition. Along with the development of telemedicine, the delivery of ECG recordings are needed in real time conditions, so that the delivery times was expected as soon as possible. Therefore, it is necessary for the ECG signal data compression during transmission can be done quickly so it will has a low delay.

This Final Project analyze wavelet based ECG signals compression algorithm with a low delay property. The algorithm set the frame size to achieve a low delay, while maintaining reconstructed signal quality. The analysis targets are getting delay under one seconds, Compression Ratio above two, Percent Root mean square Difference below 10%, and Cross Correlation above 95%. To attain both low delay and high quality, it employs frame size adjustment, wavelet compression, and run length encoding. Analysis is done to 3 types of signal which are Normal Sinus Rhythm, Arrhythmia, and Atrial Fibrillation each represented by five signal. The length of each types is different depend on their sampling frequency.

From the system test and analysis in summary for same signal length, processing more samples in one frame will lower the delay, but worse the reconstructed signal quality. The optimum value were taken from each means of the resulted parametre. For three tested signal, reach the optimum value when 10% of original samples framing and 90 Threshold Multiply Factor is done. This algorithm got a good result on the Arrhythmia signal which has Compression Ratio (CR) 9,62527, Percent Root mean square Difference (PRD) 0,60602%, Cross Correlation 99,99807%, and delay 0,225554 seconds.

Keywords : delay, frame size adjustment, wavelet compression, run length encoding, Compression Ratio, Percent Root mean square Difference, Cross Correlation.