ABSTRACT

Photoplestymograph (PPG) is an instrument that can be used to find / detect any changes in the volume of an organ in a certain interval of time. Through every wave peak of PPG output signal, which represent the heart rate, we can observe the performance of the heart. Besides being used to observe the performance of the heart PPG output signal can also can be used to monitor a person's breathing rhythm.

In this final project, digital *filter* will be designed and applied to the Matlab, PPG signals will undergo strengthening and digitization before going to the computer and through the extraction. A digital *filter* will be designed using wavelet method which can detect changes in frequency happened significantly, digital *filter* that has been applied by using matlab programming language will then be used to perform extraction itself. These digital *filter* will perform the extraction of respiratory signals which contained in the PPG output signal.

In the testing phase, with 15 as the sample data obtained by the difference measurement result data manually extracted and the measurement signal. However, the difference is not so huge happens. Compared to manual measurement, the system acquired 94% accuracy.

Keyword : Photoplestymograph (PPG), Heart Signal, Breath Rhythm Signal , Digital *Filter*, Microcontroller ATMega8535, Matlab