ABSTRACT

Respiratory rate is one of the vital signs used to determine a person's level of health. At this time, several studies have been carried out on measuring respiratory rate using an external accelerometer sensor with several methods such as Empirical Mode Decomposition (EMD) and Jerk Signal by placing the sensor on the chest surface.

In this final project, the development of respiratory rate measurement using the accelerometer sensor on the Android smartphone is carried out by measuring the respiratory rate in 3 parts of the diaphragm, namely the right, middle and left parts. For respiratory rate data collection using the Seismocardigraphy (SCG) method with a measurement frequency of up to 200 Hz and then processed using the Empirical Mode Decomposition (EMD) method.

The final result obtained from this final project is the measurement of respiratory rate data using the Seismocardiography method and peak detection on the Seismocardiography signal which has been denoising the signal using the Empirical Mode Decomposition method in Matlab software. Data retrieval was carried out using the accelerometer sensor on the Samsung A20S Android smartphone with a measurement frequency of up to 200 Hz so as to get an accuracy result of 99.40% in the position of placement in the diaphragm.

Keywords: *Respiration Rate, Accelerometer Sensor, Seismocardiography, Empirical Mode Decomposition*