

ABSTRACT

Heart rate is a parameter that reflects the condition of human health in the cardiovascular system and reflects a person's physiological condition. At this time, several research and development have been carried out regarding heart rate measurement using accelerometer and gyroscope sensors with several methods such as using R peak detection and digital band pass and peak detection methods. However, the drawback in previous studies is the lack of sensitivity and accuracy which is influenced by the limit of the frequency of measurements carried out during the study, which is 100 Hz or 100 data per second caused by the device used, namely the iPhone smartphone. The large comparison of the measurement frequency affects the amount of data obtained and the sensitivity of the measurement.

This study aims to overcome some of these problems by developing a heart rate measurement using an accelerometer sensor and a gyroscope sensor on an Android smartphone. In this study, a seismocardiography signal processing method was developed to obtain heart rate information with a measurement frequency of up to 200 Hz.

The results obtained from this study are heart rate data measurements using seismocardiography signal extraction methods and AO peak detection on the accelerometer sensor and gyroscope sensor on the Samsung A50 android smartphone with a measurement frequency of up to 200 Hz and a sampling frequency of 205 Hz to obtain an accuracy of 99.75% with the position of the measurement in the upper abdomen and the accuracy of the results of 99.43% with the placement position in the sternum.

Keywords: *Heart rate, accelerometer, gyroscope, seismocardiography, peak detection, digital band pass.*