ABSTRACT

Internet of Things is a technological breakthrough that can help everyday human activities. IoT helps what humans must do, can be controlled remotely, such as monitoring the physical condition of a person's body. The IoT approach in medical matters has begun to be carried out such as monitoring and diagnosis of the patient's condition. However, for medical activities, real-time IoT is needed, so that it is expected that the signal or data of the patient's body, can be sent quickly and accurately so that no diagnosis is made. So, we need a compression method that can represent the signal as the original signal with a small number of samples, namely Compressive Sensing.

Compressive Sensing makes it possible to do the compression and sampling process simultaneously and can be done under the terms of the Shannon-Nyquist theorem. The main requirement to be able to do compression with CS is that the compressed signal must be sparse or sparse. In this final project research, the Haar-DWT transformation method, and Threshold-DWT transformation method are used for the process of sparsification and signal reconstruction process, one of the methods, namely Orthogonal Matching Pursuit. The input signal to be used is an electrocardiogram (ECG) signal. ECG signal is a sparse periodic biomedical signal, making it possible to be compressed by CS. The process of taking ECG signals is done with the AD 8232 ECG module which is connected to a microcontroller and connected to three leads in the human body. The hope, the application of CS on this ECG signal can be implemented as a medical aid in monitoring portable ECG signals by IoT.

The results obtained from this study were to obtain the acquisition and reconstruction process of 64 ECG signal samples per process, with the DWT-Haar sparsification method without a threshold, as well as an optimal compression ratio of 80% with a SNR value of 28.818 dB, MSE 573.548, MAE 0.697 and PRD 0.174%.

Keywords: *Compressive Sensing, Discrete Wavelet Transform, Orthogonal Matching Pursuit*