

ABSTRACT

In the medical world, the concept of Wide Body Sensor Network (WBSN) technology is growing in Indonesia for monitoring the health of the human body. Electroencephalography (EEG) is a method for recording electrical activity produced by the brain. But in WBSN there are disadvantages, namely the limitations of biosignal sensor power and limited sensor computing capabilities. As well as large signal sizes require a large storage capacity. By Therefore, compressive sensing (CS) methods are needed to improve delivery efficiency, with the smallest measurement rate (MR) as well as accuracy rates. and good performance.

This Final Task implements CS on EEG signals, using the Raspberry Pi 3 Model B+. CS implementation has two stages, namely acquisition and reconstruction. The acquisition phase was made using Fast Fourier Transform (FFT) in sparsity transformation and using the Toeplitz Random Matrix for projection transformation. The reconstruction stage uses the Greedy algorithm method Analysis Pursuit (GAP) for signal reconstruction.

Signal reconstruction testing conducted using assessment parameters in the form of Mean Absolute Percentage Error (MAPE), Mean Square Error (MSE) Signal-to-Noise Ratio (SNR). Based on these tests, the results of the implementation of CS reconstruction on Raspberry Pi 3 devices, can reconstruct the data. 512 samples using MR 50%, with a MAPE value of 9.68%, MSE by 0.001288, and SNR by 3.60 dB with processing time 1946.5130 seconds.

Key Word : EEG, compressive sensing, Greedy Analysis Pursuit