ABSTRACT

This Final Project compared a denoising system to reconstruct EEG (Electroencephalogram) signals. Denoising the EEG signal is important because there is unwanted noise so that in the EEG signal analysis it is difficult to get the actual signal information. In this study there are two cases, namely the clean EEG signal will be given two different noise, namely Additive White Gaussian Noise (AWGN) and Ocular Noise, which in each case will be denoised using two methods namely Emphirical Mode Decomposition (EMD) and Discrete Wavelet Transforms (DWT). Testing is done to obtain measurement parameters, namely Mean Squaredd Error (MSE), Signal-to-Noise Ratio (SNR), and Peak Signal-to-Noise Ratio (PSNR).

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Based on the test results of 5 EEG signal data, the best denoising for AWGN is done by the DWT method with DB12 Wavelet Base, Threshold Method SURE with hard threshold and Decomposition Level 6 with MSE values of 0.000029, SNR 27.97 dB and PSNR 26.20 dB. In the Ocular Noise experiment, DWT with DB12 Wavelet Base and decomposition level 1 showed the best results at SNR of 29.99 dB PSNR 23.769 dB, while the best MSE results of 0.00060 were given by EMD method with hard thresholding at decomposition value 0.1.

Keywords*: Electroencephalogram* (EEG), *Denoising, Emphirical Mode Decomposition* (EMD), *Discrete wavelet Transform* (DWT)