Abstract

An electrocardiogram (EKG) is a signal produced by the electrical activity of the heart. Electrocardiogram signal is the main parameter to determine the condition of the human heart. Measurement using EKG can be composed early disease of heart disease, so it can reduce the death rate of heart patients. But the measurement results using EKG is often caused by noise. Noise can not removed by simple lter method. Some previous research There have been many developed ECD-based denoising techniques based on Empirical Mode Decomposition (EMD), but there is no ordinary and compare that matter. This final paper will be a dependent and a comparison of the performance of denoising methods on Empirical Mode Decomposition (EMD). Test method of this method using Matlab with metric: Mean Square Error (MSE), Mean Ab- (MAE) and Signal Ratio to Noise (SNR). In this test, Gaussian White noise, Artificial Muscle Noise, Movement Noise Electrode, and Noise Baseline wander will be added to the ECG signal before applying denoising technique Next calculate the value of MSE, MAE and SNR done on the signal denoising results. The research was successful three methods of thresholding on four different types of noise. Hard Method thresholding has the best performance for all noise types ie AWGN noise, muscle artifac, electrode movement, and wandering baseline. For Additive White Gaussian Noise (AWGN) method of hard thresholding results MSE, MAE and SNR of 0.1490, 0.2700, and 9.8025 dB. For Noisy muscle artifacts, hard thresholding methods of MSE, MAE results and SNR are 0.0036, 0.0327 and 41.1157 dB, respectively. In the noi- se method of hard thresholding electrode movement produce MSE 0,0093, MAE 0.0366 and SNR 30.7660 dB. Last and not least, method This thresholding drive produces MSE 0.0079, MAE and SNR values respectively are 0.0354 and 28.4896 db at the baseline wander noise.

Keywords: ECG, EMD, Noise, Denoising, Signal Noise Ratio, Mean Square Error.