ABSTRACT

Electrocardiogram (ECG) signals are often contaminated by various noise sources, such as electrical power interference, motion artifacts, and muscle noise, which can interfere with the accuracy of medical analysis and diagnosis. Therefore, an effective method is needed to reduce noise so that the obtained ECG signal is cleaner and can be interpreted more accurately. One approach that is widely used is the adaptive filter with the Least Mean Squares (LMS) algorithm. The LMS adaptive filter has the advantage of dynamically adjusting the filter weight based on changes in signal characteristics, so that it can eliminate noise without damaging the main components of the ECG signal. This study aims to reduce noise in the ECG signal so that the signal has a better level of accuracy in the diagnostic process. To improve the accuracy of ECG signal analysis, an effective noise reduction technique is needed. Performance measurement uses SNR (Signal to Noise Ratio) which will calculate a significant increase in signal quality compared to the signal before filtration. The expected results of this study are a decrease in ECG signal noise and changes when simulated with the method that has been applied, where the results will be different from the ECG signal before filtration. The results obtained based on yhe tests that have been carried out, the signal changes after denoising can approach the original signal on the 8^{th} order filter with step size of 0.001 and 0.01.

Kata Kunci: *electrocardiogram, adaptive filter, least mean squares, noise*