

## ABSTRACT

Muscle fatigue is the inability of a person to do activities due to continuous muscle contraction. Muscle fatigue can cause a person to suffer an injury if no fatigue is identified. Therefore we need a device that can capture muscle movement activities accurately. Electromyography (EMG) is a representation of electrical signals contained in the muscle layer during active movements that are indicated from nerves. There are 2 ways to get EMG data, which is based on the skin layer (surface) and the electrode needle. In this final project uses surface EMG (sEMG).

However, the use of sEMG always gets noise from various factors. This research choose the topic of eliminating noise by implementing the discrete wavelet transform method and the kalman filter. The previous research stated that both of these methods were declared capable of denoising signals, but the results of denoising are not implemented into a particular classification.

The results of these two methods get result of SNR value of 30,46793 for the DWT and 20,89543 for the Kalman filter, and for the MSE value the the DWT result is 0,019184 which is better than Kalman filter result 0,057753. The result of classification of muscle fatigue using signal data that has not experienced denoising before has an accuracy of 95,06%, and the signal that has been denoised is 96.69% for Kalman & 97.28% for DWT. So for this research it's said that the Kalman filter is the best denoising method.

**Keywords:** *Electromyograph, denoising, muscle fatigue, discrete wavelet transform, Kalman filter.*