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**Title:**

Feature and Muscle Selection for an Effective Hand Motion Classifier Based on Electromyography

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**Title and Abstract**

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**ABSTRACT**

The major problem in the hand motion classification based on electromyography (EMG) system is the failure of choosing the right features and number of muscles. Those parameters are very important because they determine the effectiveness and the accuracy of the classifier system. Therefore, the objective of this study is to develop and evaluate an effective hand motion classifier based on the EMG signal. The three-channel of EMG signal was collected by placing three pairs of electrodes at the surface of the skin. Six statistics features (mean, variance, standard deviation, kurtosis, skewness, and entropy) were selected to extract the EMG signal using windows length of 100 samples. A muscle and features selection are applied to the classifier machine (linear discriminant analysis (LDA), support vector machine (SVM) and K nearest neighborhood (KNN)) in order to get the effective feature and muscle. In this study, we found that there was no significant difference in accuracy among a number of muscles (p-value>0.05). LDA and SVM showed the best accuracy and there was no significant difference in accuracy between both of them. This research showed that EMG signal from single muscle is able to classify the hand motion effectively.

**Keywords:** *Electromyography, pattern recognition, statistic features, LDA, SVM, KNN*.