

Comparison of Linear Discriminant Analysis and Support Vector Machine Classifications for Electromyography Signals Acquired at Five Positions of Elbow Joint

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Abstract : Bio Mechatronics has extended applications in the field of rehabilitation. It has been contributing since World War II in improving the applicability of prosthesis and assistive devices in real life scenarios. In this paper, classification accuracies have been compared for two classifiers against five positions of elbow. Electromyography (EMG) signals analysis have been acquired directly from skeletal muscles of human forearm for each of the three defined positions and at modified extreme positions of elbow flexion and extension using 8 electrode Myo armband sensor. Features were extracted from filtered EMG signals for each position. Performance of two classifiers, support vector machine (SVM) and linear discriminant analysis (LDA) has been compared by analyzing the classification accuracies. SVM illustrated classification accuracies between 90-96%, in contrast to 84-87% depicted by LDA for five defined positions of elbow keeping the number of samples and selected feature the same for both SVM and LDA.

Keywords : classification accuracies, electromyography, linear discriminant analysis (LDA), Myo armband sensor, support vector machine (SVM)

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