



Individual Finger Movement Recognition Based on sEMG and Classification Techniques

Laura Stella Vega Escobar
Andrés Eduardo Castro Ospina
Leonardo Duque Muñoz

Instituto Tecnológico Metropolitano, Medellín, Colombia. andrescastro@itm.edu.co

Abstract

Hand gesture recognition is an active research area of human machine interfaces in which the person performs a hand gesture and a machine recognize the actual movement. However, the gestures can be seen as combination of individual finger movements, and recognizing the individual finger movements could improve the gesture recognition. This work presents a framework for finger movement recognition based on the feature extraction of the superficial electromyographic signals generated in the arm. We acquired a dataset with 54 subjects, and eight signals (channels) per subject. Then, features extracted in three types of domains were analyzed namely, time, frequency, and time-frequency forming a feature set of 720 features. A subset of features were selected and a support vector machine and k -NN classifiers were trained with a 10-fold cross-validation to prevent overfitting. We reached an accuracy over 90% implying that our proposed framework facilitates the finger movement recognition.

Keywords: Acquisition, Classification, Feature selection Finger movement recognition, sEMG, Validation

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