

The Classification of Parkinson Tremor and Essential Tremor Based on Frequency Alteration of Different Activities

Authors : Chusak Thanawattano, Roongroj Bhidayasiri

Abstract : This paper proposes a novel feature set utilized for classifying the Parkinson tremor and essential tremor. Ten ET and ten PD subjects are asked to perform kinetic, postural and resting tests. The empirical mode decomposition (EMD) is used to decompose collected tremor signal to a set of intrinsic mode functions (IMF). The IMFs are used for reconstructing representative signals. The feature set is composed of peak frequencies of IMFs and reconstructed signals. Hypothesize that the dominant frequency components of subjects with PD and ET change in different directions for different tests, difference of peak frequencies of IMFs and reconstructed signals of pairwise based tests (kinetic-resting, kinetic-postural and postural-resting) are considered as potential features. Sets of features are used to train and test by classifier including the quadratic discriminant classifier (QLC) and the support vector machine (SVM). The best accuracy, the best sensitivity and the best specificity are 90%, 87.5%, and 92.86%, respectively.

Keywords : tremor, Parkinson, essential tremor, empirical mode decomposition, quadratic discriminant, support vector machine, peak frequency, auto-regressive, spectrum estimation

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