

عنوان مقاله:

Predicting termination of Paroxysmal atrial fibrillation using higher order statistics in EMD domain

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خلاصه مقاله:

This paper presents an algorithm for predicting termination of paroxysmal atrial fibrillation (PAF) attacks by using higher order statistical moments of RR-intervals signal calculated in the empirical mode decomposition (EMD) domain. In the proposed method, RR-intervals signal is decomposed into a set of intrinsic mode functions (IMF) and higher order moments including variance, skewness, and kurtosis, calculated from the first four IMFs. The appropriateness of these features in predicting the termination of PAF is studied using atrial fibrillation termination database (AFTDB) which consists of 3 types of AF episodes: N-type (non-terminated AF episode), S-type (terminated 1 min after the end of the record), and T-type (terminated immediately after the end of the record). By using a Support vector machine (SVM) classifier for classification of PAF episodes, we obtained sensitivity, specificity, and positive predictivity 93.45%, 96.73%, and 94.84%, respectively. The important advantage of the proposed method comparing to the other existing approaches is that our algorithm can simultaneously discriminate 3 types of AF episodes with high accuracy. The results demonstrate that the extracted features in EMD domain can be used as a suitable tool for predicting termination of PAF.

کلمات کلیدی:

empirical mode decomposition , Higher order statistics , paroxysmal atrial fibrillation , RR-intervals signal

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