عنوان مقاله:

Sudden Cardiac Death (SCD) Prediction Using Empirical Mode Decomposition(EMD) and Minimum-Risk Bayesian Classifier

نویسندگان:

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خلاصه مقاله:

Sudden cardiac death (SCD) is one of the most widespread reasons for death around the world. A precise and earlyprediction of SCD can improve the chance of survival by administering cardiopulmonary resuscitation (CPR). Hence,there is a vital need for an SCD prediction system. In previos works, the aim was to minimize the detection error andthe misdetection of SCD and normal persons have the same priority. But, as we know misdetection of SCD personsas normal persons is most harmful. Therefore, in thi paper we present a method to reduce the classification risk inwhich our aim is to reduce the number of SCD persons that wrongly detected as healthy persons. The ECG signal issegmented into intervals with one minute length and then the heart rate variability (HRV) signal is calculated. In orderto feature extraction, HRV is decomposed using discrete wavelet transform (DWT) and emporocal modedecomposition (EMD). From the outputs of DWT and EMD, six and ۱۴ features are calculated respectively whichresults in ۲۰ features for each ECG signal. In order to detect SCD event, a minimum-risk Bayesian classifier is used.The results show that the proposed method reduce the probability of misdetection of SCD samples as normal samples,while achieves the good classification accuracy. We also, analyze the SCD prediction for ۳۰ munites before itsoccurrence and achive good results.

کلمات کلیدی:

sudden cardiac death (SCD), minimum-risk classifier, ECG, EMD, DWT

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