عنوان مقاله:

Three-dimensional Phase Space Characteristics of Electrocardiogram Segments in Online and Early Prediction of Sudden Cardiac Death

محل انتشار:

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خلاصه مقاله:

Introduction: Predicting sudden cardiac death (SCD) using electrocardiogram (ECG) signals has come to the attention of researchers in recent years. One of the most common SCD identifiers is ventricular fibrillation (VF). The main objective of the present study was to provide an online prediction system of SCD using innovative ECG measures ۱۰ minutes before VF onset. Additionally, it aimed to evaluate the different segments of the ECG signal (which depend on ventricular function) comparatively to determine the efficient component in predicting SCD. The ECG segments were QS, RT, QR, QT, and ST.Material and Methods: After defining the ECG characteristic points and segments, innovative measures were appraised using the three-dimensional phase space of the ECG component. Tracking signal dynamics and lowering the computational cost make the feature suitable for online and offline applications. Finally, the prediction was performed using the support vector machine (SVM).Results: Using the QR measures, SCD detection was realized ten minutes before its occurrence with an accuracy, specificity, and sensitivity of ۱۰۰%.Conclusion: The superiority of the proposed system compared to .the state-of-the-art SCD prediction schemes was revealed in terms of both classification performances and computational speed

کلمات کلیدی:

Electrocardiography, death, Sudden, Cardiac, Prognosis, Online Systems