

Efficient Method to Extract QRS Complex and ST Segment for Cardiovascular Diseases Prediction

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Abstract

For the heart diseases, the early prediction required to save the human being life. There are several ways to perform the early prediction of Cardiovascular Disease (CVD), however the most of the state-of-art approaches are expensive with poor accuracy of prediction. The computerised approach used the Electrocardiogram (ECG) signals to perform the early prediction of CVD. The ECG based approach is simple, effective and inexpensive; hence it gains the significant attention of researchers from last two decades. The Computer Aided Diagnosis (CAD) system introduced the ECG based approach for CVD prediction using the ECG signal of patients on which the algorithms single processing, data mining, and machine learning applied for accurate prediction. ECG based CVD detection framework composed of three main sections that is preprocessing, features extraction, and classification. The steps like preprocessing and features extractions are crucial for the efficiency of CVD detection. In this paper, we proposed the novel framework of CVD detection of Q, R, S, T beats efficiently from the pre-processed ECG signal. From the pre-processed ECG signal, our aim is to extract QRS and ST segments using the dynamic and simple thresholding approach. The segments are used then for the statistical features extraction. The classification is performed by using the Artificial Neural Network (ANN) classifier. The proposed method shows the precision rate, recall rate, detection accuracy and detection time are 0.91, 0.92, 0.91 and 1.51 respectively. It shows the balance between the accuracy and prediction time performance as compared to state of art method.

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