Abstract

Premature Ventricular Contraction (PVC) is one type of heart electrical rhythm disorder (arrhythmia) which is triggered by the presence of abnormal pulses in the ventricles. This causes premature QRS waves to emerge. In addition, PVC triggers the loss of P waves that normally appear before QRS waves. In general, PVC detection is carried out through three stages, namely pre processing, feature extraction, and classification. The feature extraction stage in the PVC detection process has an important role, because it produces characteristic features that are used for the classification process. There has been a lot of literature discussing PVC detection, but most of it focuses on classification algorithms and still has feature extraction algorithms that produce low accuracy. In addition, the development of prototypes for the detection of PVC is also still rare. To answer this problem, this final project conducts a study on feature extraction algorithms and finds the appropriate feature features for PVC detection using the derivative and squared signal method that produces characteristic features in the form of RR intervals and QRS widths. In this method, squared and derivative signals are used to find the location of the R point and type of QRS-pattern, which is used to determine the distance of the RR-interval and QRS width. This final project also designed a prototype to implement a PVC detection algorithm. The results of performance analysis show that the algorithm used has an accuracy value of 95.206%. Meanwhile, when compared to the research conducted by Cuesta in 2014, the sensitivity and specificity gained were 8.128%, and 12.185%.

Keywords: ECG, PVC, feature extraction, QRS width, RR interval, QRS pattern