

ABSTRACT

Accurate automated and reliable P-wave detection is important for electrocardiography (ECG) analysis to help doctors treat heart diseases in patients. Unlike QRS detection, P-waves detection has not been studied as much as QRS-Complex detection. This work introduced methods to detect and locate P-waves in normal and pathological conditions. Pathologies included were PVC, NOD, Afib, Aflutter, and AVB II. ECG records data used are MITDB (MIT-BIH Arrhythmia database) which was retrieved from www.physionet.org. This database has been annotated by experts. The results of these algorithms were divided and discussed per pathologies contained on each record. The accuracy For P-wave detection in normal conditions are 96.38% for the Sensitivity (Se) and 98.77% for the Positive Predictivity (PP). For P-wave in pathological condition, 85.23% for the Sensitivity (Se) and 85.22% for the Positive Predictivity (PP). Disturbance and interference caused by each pathology towards these algorithms are discussed and explained and these algorithms also have been tested in real-life data simulation, so that they can run on real-time analysis, for remote monitoring in portable ECG.

KEYWORDS: *Cardiac device therapy, Biomedical engineering, Electrocardiography (ECG), P-wave, P-wave detection, Real-time analysis, Python*