Abstract

Cardiac arrhythmias are abnormal heart rhythms that can lead to serious health problems, including heart attack and stroke. Atrial fibrillation (AFIB) is one example of cardiac arrhythmias. One of the most common methods for detecting AFIB is through the use of electrocardiography (ECG) signals. Physicians use ECG records to detect arrhythmias listed above by analyzing the electrical activity of the heart. However, the symptoms may not always be present, so it is possible for a physician to misdiagnose the condition. To ensure that said arrhythmias are detected in a timely manner and prevent potential life-threatening incidents, the patients must undergo continuous monitoring. However, it is difficult to develop a readily available and inexpensive method for detecting AFIB using ECG signals due to the technical challenges and cost associated with procuring ECG signals. To overcome this problem, we explored the use of photoplethysmography (PPG) signals acquired from smartphone camera to detect AFIB using ECG based ensemble learning model. ECG datasets are used due to the abundance of publicly available datasets, and the high degree of correlation between ECG and PPG in RR Interval and Peak-to-peak Interval respectively. Our goal was to develop a cheap, readily available, real-time method for detecting AFIB. The resulting classification method reach an accuracy of 88,372%, specificity of 95,000%, sensitivity of 87,156%, and f1 score of 92,683%

Keywords: Atrial Fibrillation , RR Interval, Peak-to-peak Interval, Ensemble Learning, Photoplethysmography.