

ABSTRACT

Atrial fibrillation (AF) is an abnormal heart rate condition caused by the atria or atria of the heart contracting more rapidly so that blood cannot be fully pumped into the heart chambers (ventricles). AF can be a trigger for cardiovascular disease that can lead to coronary heart disease, stroke, and hypertension. AF detection can be done manually by a doctor by identifying Electrocardiogram (ECG) signals. Along with the times, many technological devices are made to help identify ECG signals. This can be used by doctors and medical personnel to read and analyze abnormalities of cardiac activity, in the hope of getting optimal results with the most efficient time possible. Therefore, in this final project, the author designed a system to detect AF automatically to get optimal results and efficient time.

ECG signal classification is divided into 2 classes, namely Atrial Fibrillation (AF) and Normal Sinus Rhythm (NSR). The dataset used in this final task uses from the Massachusetts Institute of Technology Beth Israel Hospital (MIT-BIH) Normal Sinus Rhythm Database PhysioNet dataset and Atrial Fibrillation Database PhysioNet which contains 25 long-term ECG signal recordings. patients with AF and 18 long-term recordings of ECG signals under normal conditions.

In this final task, an AF detection system will be made using the Convolutional Neural Network (CNN) method with 1-Dimensional CNN architecture. The test scenario is carried out on 5 layer models, time parameters, learning rate value, looking for the best optimizer, and finding the right batch size to get the best performance. The best performance is obtained using 5th model, yhe time parameter is 8 seconds, learning rate 0.001, Adam optimizer, and the batch size is 64. The result obtained are 100% accuracy, 100% recall, 100% precision, and 100% f-1 score.

Keywords : *Atrial Fibrillation (AF), Convolutional Neural Network (CNN), Electrocardiogram (ECG), Normal Sinus Rhythm (NSR).*