ABSTRACT

The heart is a hollow and muscular organ of the human body that plays a role in the human circulatory system. In the process of diagnosing heart conditions, it can be through an Electrocardiogram (ECG). An electrocardiogram (ECG) is a test to measure and record the electrical activity of the heart using an electrical impulse detection machine (electrocardiograph). An ECG is performed if you have a heart rhythm disorder (arrhythmia), where the patient's heart rate beats abnormally, such as beating too fast, too slowly, or irregularly. Deep learning is needed to classify ECG signals in the heart because it can analyze data on a large scale, diagnose faster and more efficiently, and have higher accuracy than traditional methods.

In this research, the author classifies using Deep Learning, with the classification of ECG signals divided into 2 classes, namely Normal Sinus Rhythm (NSR) and Arrhythmia. The dataset used in this final project used datasets from the Massachusetts Institute of Technology Beth Israel Hospital (MIT-BIH) Arrhythmia Database PhysioNet and the Normal Sinus Rhythm Database PhysioNet which contained 24 ECG signal recordings collected from a mixed population of outpatients and inpatients and 18 long-term ECG signal recordings under normal conditions. In this final project, we designed an Arrhythmia detection system using the Convolutional Neural Network (CNN) method with a 1-Dimensional CNN architecture. The test scenario is carried out on the optimizer, learning rate value, and batch size to get the best performance.

In this final project, we designed an Arrhythmia detection system using the Convolutional Neural Network (CNN) method with a 1-Dimensional CNN architecture. The test scenario is carried out against the learning rate value, looking for the best optimizer, and looking for the right batch size to get the best performance. The best performance was obtained by using RMSProp optimizer, learning rate 0.01, and batch size 8. The results were obtained with 100% accuracy, 100% recall, 100% precision, and 100% F-1 score.

Keywords : *Convolutional Neural Network (CNN), Heart Disease, PhysioNet*