ABSTRACT

Arrhythmia or heart rhythm disorder is a disorder that occurs when the electrical impulses in the heart do not work properly. When an arrhythmia occurs, the heart beats are abnormal, irregular, fast or slow. Arrhythmias are divided into tachyarrhythmias, bradyarrhythmias, atrial fibrillation and ventricular fibrillation. Complications of these arrhythmias can lead to stroke, heart failure and sudden death. The tests performed to detect arrhythmias are electrocardiogram or EKG. On the ECG examination will be obtained a signal that will be used to detect the occurrence of arrhythmias or heart rhythm disturbances.

This final project is carried out to detect arrhythmias or heart rhythm disturbances according to electrocardiogram signals using linear interpolation. Linear interpolation is the simplest form of interpolation by connecting two data points with a straight line. The classification used is Recurrent Neural Network (RNN), which is a classification whose calling process is repeated. This research has been carried out using a dataset obtained from DataHub.io with a total of 452 data with data in tabular data and divided into two classes, namely normal data and arrhythmic data. In the trial process, the data is divided into 80% train data and 20% test data. The algorithm used in this research is Recurrent Neural Network (RNN)-Long Short Term Memory (LSTM).

In this research, a test scenario was conducted to find the best hyperparameter. In using the dataset before interpolation, the best hyperparameter results are epoch 100, learning rate 0.0001, batch size 32 and Adam optimizer. The accuracy obtained when using this best hyperparameter gets an accuracy of 0.8148 validation accuracy of 0.7857 with a validation loss value of 0.5294. Then after using the dataset after interpolation, the best hyperparameter values obtained are epoch 100, learning rate 0.001, batch size 128 and Adam's optimizer. The accuracy obtained when using the best hyperparameter is 0.8864 and the validation accuracy is 0.7692 with a loss validation of 0.6149.

Keywords: **Arrhythmia, Electrocardiogram, Linear Interpolation, Recurrent Neural Network (RNN)-Long Short Term Memory (LSTM).**