Early Heart Disorder Prediction System using Artificial Neural Network and K- Fold Cross Validation Model

S. A. Amutha Jeevakumari[1] and Satwik Samyaan[2]

[1]Vellore Institute of Technology, Chennai, India.

[2]Vellore Institute of Technology, Chennai, India.

amutha.jeevakumari@vit.ac.in

ABSTRACT

This paper focuses on developing an early heart disease prediction system fora broader group of people. A data set with highly processed Electrocardiogram (ECG) signal values as well as other attributes essential for the diagnosis ofa variety of heart-related diseases was obtained and was then further processed to remove any anomalies and outliers. The data set was separated into two sections, one containing category inputs and the other binary inputs. Then, using the Keras framework, we created a three-layer deep learning model and fed it the data set. The model with the binary data set yielded an accuracy of 93.89 percent, which is satisfactory given that this data set was adjusted to include cancer cases in individuals aged 18 to 77. Along with the Artificial Neural Network (ANN), K- Fold Cross Validation model was also developed, and data was fed into it. This model was able to detect cardiac disease withan accuracy of 91.6 percentage, which is very high and useful for anomaly detection. This technology allows us to detect heart anomaliesand diseases in a broader population with greater precision.

Keywords: Electrocardiogram Signals, Artificial Neural Network (ANN), K- Fold Cross Validation model, Neural layers, Heart disease, Classification

1. INTRODUCTION

There are an increasing number of ailments that are un- folding to unanticipated regions. Each disease has distinctive symptoms, causes, and treatments. Some people are able to combat these diseases, but the vast majority are susceptible to their attacks. The most lethal of these is cardio-vascular disease. According to the surveys conducted by the researchers, approximately 80 percent of cardiac disease are fatal. This is a very large and significant number.

Doctors have discovered that heart disease, if detected early, can be cured or at least managed with the aid of the correct medication. Therefore, if we can find a method to figure out whether a person has a heart condition before it becomes severe, this could save a great number of lives. In recent years, the re- search and evaluation of ECG signals have yielded numerous important findings and conclusions.

An electrocardiogram is a recording of the heart's electrical signals. It is a common, nonsurgical test used to detect heart issues and supervise the heart's health quickly. An electrocardiogram may be used by a medical professional to diagnose arrhythmia, coronary artery disease and ventricular tachycardia. P wave, QRS complex, as well as T wave are the three most prominent features of each heartbeat's signal.

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