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Future Prediction of Cardiovascular Disease Using Deep Learning Technique

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Abstract. Cardiovascular disease is the one of the most leading causes of death. Based on symptoms and risk factors the diagnosis of heart can be done. Predicting the cardiovascular disease in the early stage can save the human being. There is no complete cure which reduces the risk of CVD.Deep learning technique has been used to predict the CVD in a prior stage. Based on the symptoms and risk factors, the CVD has been classified into four types such as No heart disease and no symptoms, Structural Heart Disease without symptoms, Structural Heart Disease with Symptoms and the risk factor for Heart failure are "High blood pressure, high cholesterol, genetic, diabetes, obesity is the major risk factors" to identify the cardiovascular disease and current technique is used to control the risks. To manage all the risk factors Electrocardiography (ECG) method is used to manipulate based on particular situation.

Keywords: CVD, Healthcare, risk factors.

1. Introduction

An estimation done by World Health Organisation (WHO) in the year 2016 for the CVD patients is nearly about 17.9 million people. It is nearly 31%.Because of CVD the huge death occurs. The group of disorder of heart and blood vessels includes coronary heart disease, rheumatic heart disease and other conditions. Under the age of 70 years, one third of the death occurs because of heart attack and stroke. In an earlier stage it is very difficult to predict the CVD affected patients. Based on the symptoms and risk factors the CVD affected patients has been found out. Some of the risk factors like "high blood pressure, Diabetes, High blood Cholesterol, genetic and obesity. Some of the symptoms like pain in chest, shortness of breath, cold sweat and nausea and fatigue. Coronary heart disease ,High blood pressure, Cardiac Arrest, Heart failure and Arrhythmia, Peripheral artery disease and stroke are the some of the types of heart disease.

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2. Related work

From the sudden increase of blood pressure with the development of acute decompensate heart failure (ADHF). Out of 3239, 113 patients were analyzed and produced the composite endpoint group and non-composite endpoint group. The cut-off value for composite endpoint was 8.65. Need more clinical study to confirm this result[1]. To find the correlation between TG/HDL-Cholesterol ratio with cardiac risk factors. Chi-square test was computed to check relation of cardio metabolic risk factors like hypertension, diabetes and obesity with TG/HDL-C ratio[2]. The best predictor in XG Boost model. They has been developed a highly precise prediction model for future hypertension [3]. For maintaining normal cardiac and metabolic status Natriuretic Peptides (NP) are important and have been used to predicts cardiovascular events. The three bioactive counterparts such as NTproANP, NTproBNP and NTproCNP were measured randomly in 348 samples. Oppositely extract relation were found among plasma NTproBNP or NTproANP[4].Administrative database has been used and the data has been divided into derivation and validation samples. Two-third has been used for derivation and remaining has been used for validation [5]. The epigenetic mechanism lies between cancer and cardiovascular disease and a small importance to burgeoning field of cardio-oncology[6].To assess the utility of Computed Tomography (CT) based abdominal aortic calcification for the prediction of LVDD and prognosis of asymptomatic pre-dialysis CKD patients[7]. Without using CT, MRI or other diagnostic equipment they predict the concomitant development of macroangiopathy in diabetic in a single clinical has been evaluated. The major limitation of this study is the author may have missed a macroangiopathydiagnosis[8]. For analyzing medical images the deep learning algorithm [10-32], in specific CNN is the most popular one. In DL the survey has taken from classification, segmentation and object detection[9].

3. System Architecture

Fig 1 represents the collection of patient's detail, in which it contains the blood pressure, cholesterol, genetic, diabetes and obesity, etc. After the collection of dataset, pre-processing has been done. Data pre-processing is transforming the raw data into an understandable format. After the data pre-processing, the data cleaning has been done. Data cleaning is the process of process of removing incorrect or duplicate data within the dataset.

Figure 1. Recognize Cardiovascular Disease using Deep Learning Technique

Training the models is said to be the data which should be trained and it is the initial set of data which is used to help a program understand how to apply deep learning techniques and produce sophisticated results. Testing the models is used to fit the model and testing data to test it and the generated models are to predict the results unknown which is said to be test set. The performance will be measured by using the test data only. The results will be collected for the two techniques which is used under the concept of convolution neural network and it will be compared to predict cardiovascular disease.

4. Dataflow Diagrams

4.1. Level 0

Collect a datasets from health care. Process the collected dataset and finding cardiovascular disease affected patients.

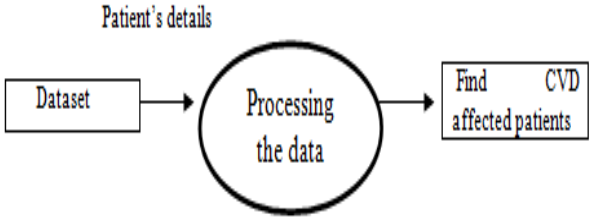

Figure 2. Level 0 DFD Diagram

4.2 Level 1

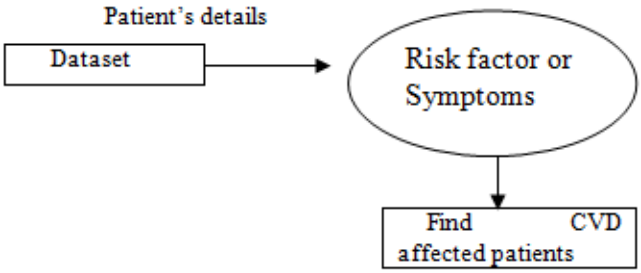

Figure 3. Level 1 DFD Diagram

5. Conclusion

In this paper, different attributes have been used and we can easily find the cardiovascular disease patients by analysing all the attributes. If the patient level goes abnormal, it makes sure to intimate the medical practitioner and the cardiovascular disease affected patients will be identified and prevented easily.

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