Binary View Classification of Automatic Echocardiogram Analysis Using Deep Learning

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***Abstract*: It might have happened so many times that you or someone you know needs doctors' help immediately, but they are not available for some reason. The Heart Disease Prediction application is an end-user support and online consultation project. Here, we propose a web application that allows users to get instant guidance on their heart disease through an intelligent system online. The application is fed with various details and the heart diseases associated with those details. The application allows users to share heart-related issues. It then processes user-specific details to check for various illnesses that could be associated with them. Here, we use some intelligent data mining techniques to guess the most accurate illness that could be associated with the patient's details. The patient can then contact the doctor for further treatment based on the results. The system allows users to view a doctor's details too. The system can be used for free online heart disease consulting.**

***Keywords*: Health Care Trade, Heart Diseases, Predict, Flask**

INTRODUCTION

In modern society, the rise of industrialization and capitalism has changed the lifestyle of an individual to the point where severe medical conditions such as obesity, high and low blood pressure, tachycardia, high cholesterol, and diabetes have normalised to the point where each and every person past the age of 40 has been diagnosed with at least one of the aforementioned conditions. If necessary initiatives are not taken within the next few years, the world will be faced with the risk of doubling the number of cases diagnosed with the same disease each year. In recent years, the advent of artificial intelligence (AI) and the gradual start of AI's analysis within the medical field have allowed individuals to check out the superb prospects of the combination of AI and attention. Among them, the recent deep learning field has shown bigger potential in applications like sickness prediction and drug response prediction. From the initial supplying regression model to the machine learning model and now to the deep learning model these days, the accuracy of medical sickness prediction has been ceaselessly improved, and therefore the performance in all aspects has also been considerably improved. We tend to improve some fundamental deep learning frameworks and a few common diseases, which sums up deep learning prediction methods for various diseases. demonstrate a number of issues within the current sickness prediction and create a break for long-term development. Its goal is to demonstrate the high correlation between deep learning and the medical field in future developments and to clarify the effectiveness of deep learning in sickness prediction. The distinctive feature extraction methods of deep learning will still play a crucial role in future medical analysis. Advancements in analytical models, the handiness of GPU hardware, and cloud infrastructure began to play an important role in the binary view classification of automatic echocardiogram analysis using deep learning practises and analysis. It uses various tools and techniques to archive, manage, analyze, and predict giant volumes of structured, unstructured, and semi-structured knowledge. knowledge Science plays an important role in medical fields, with higher support for identification and cures for heart diseases. It might have happened so many times that you or someone you know needs doctors' help immediately, but they are not available for some reason. The Heart Disease Prediction application is an end-user support and online consultation project. Here, we propose a web application that allows users to get instant guidance on their heart disease through an intelligent system online. The application is fed with various details and the heart diseases associated with those details. The application allows users to share heart-related issues.

LITURATURE SURVEY

A.M. Kavitha; G. Gnaneswar; R. Dinesh; Y. Rohith Sai; R. Sai Suraj Findings: Heart disease causes a significant mortality rate around the world, and it has become a health threat for many people. Early prediction of heart disease may save many lives. Detecting cardiovascular diseases like heart attacks, coronary artery diseases, etc. is a critical challenge for regular clinical data analysis. Machine learning (ML) can provide an effective solution for decision-making and accurate predictions. The medical industry is showing enormous development in using machine learning techniques. In the proposed work, a novel machine learning approach is proposed to predict heart disease. The proposed study used the Cleveland heart disease dataset, and data mining techniques such as regression and classification were used. Random Forest and Decision Tree machine learning techniques are used.The novel technique of the machine-learning model is designed. In implementation, 3 machine learning algorithms are used: 1. random forest, 2. decision tree, and 3. hybrid model (a hybrid of random forest and decision tree). Experimental results show an accuracy level of 88.7% through the heart disease prediction model with the hybrid model. The interface is designed to get the user's input parameter to predict the heart disease, for which we used a hybrid model of decision trees and random forests. [1]

Author: Akanksha Kumari; Ashok Kumar Mehta Findings: Heart disease is the leading cause of death and hospitalisation in the world. With the advancement of technology and the contribution of computer engineering, it is easy to detect heart disease, and thus treatment is fast and effective. Machine learning is becoming increasingly popular in the medical field for predicting disease.The authors attempted to predict heart disease using seven machine learning algorithms and to improve the accuracy of weakly performing algorithms using ensemble methods such as AdaBoost and the voting ensemble method in this paper.The performance of linear discriminate analysis is good among other algorithms; its mean value is approximately 0.847 and its mean absolute error is 0.185; the false acceptance rate is lowest among all i.e.; 0.33 and the false recognition rate is 0.076, accuracy is somehow coming 80% which is less if compared with Logistic Regression.[2].

Author: A. Lakshmanarao; A. Srisaila; T.Srinivasa Ravi Kiran Findings: Cardiovascular diseases (heart-related diseases) are the reason for the deaths of 18 million people every year in the world. According to WHO,31% of the deaths worldwide are due to heart-related diseases. In this paper, we proposed a novel machine learning model for heart disease prediction. The proposed method was tested on two different datasets from Kaggle and UCI. We applied sampling techniques to the unbalanced dataset and feature selection techniques are used to find the best features. Later several classifier models were applied and achieved good accuracy with ensemble classifier. The experimentations on two datasets shown that the proposed model is effective for heart disease prediction. Python was used for all implementations.[3].

Authors: Sakshi Bhoyar, Nikki Wagholikar, and Kshitij Bakshi Findings: Stroke, heart failure, arrhythmia, and myocardial infarction are the most common cardiovascular diseases that record high mortality rates around the world. Because the available tests are prohibitively expensive, heart defects are not detected in their early stages.Thus, a fast, real-time, and reliable system that predicts the chances of a patient having heart disease in an optimised manner is required. In this research, a neural network model using a multilayer perceptron (MLP) is proposed for the prediction system. Experimental analysis resulted in an accuracy of 85.71% for the UCI Heart Disease dataset and 87.30% for the Cardiovascular Disease dataset. When compared to previous research, the increase in accuracy was approximately 12–13. A simple web application tool is also developed using Python programming to test the prediction system. This study aims to create a user-friendly tool for both medical professionals and the general public.[4]

AIM & OBJECTIVES

• We are making the system to predict the heart diseases at early stage.

• Avoid the Time-consuming task of feature extraction.

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MOTIVATION

In our proposed system, we combine the structured and unstructured data in healthcare fields that let us assess the risk of diseases and increasing the accuracy by performing different methods. We implement the multiple disease predictor that integrated to web-based application. Prediction of the heart disease results in accurate

SYSTEM ARCHITECTURE

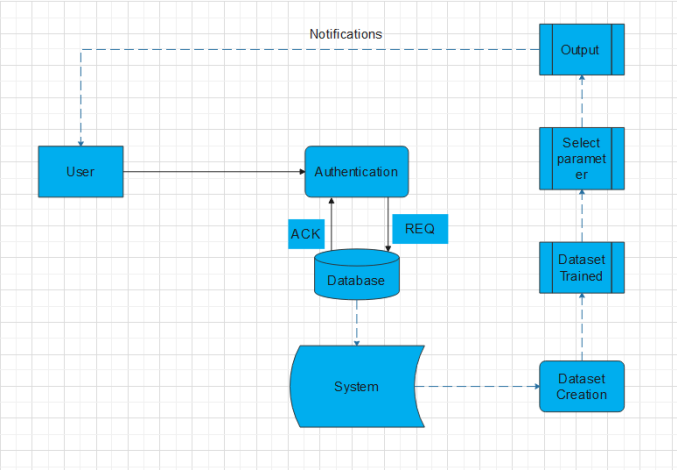

Fig -1: System Architecture Diagram

APPLICATION:

- HOSPITAL
- HEALTH SECTOR

FUNCTIONAL & NON-FUNCTIONAL REQUIREMENTS

Functional requirements: may involve calculations, technical details, data manipulation and processing and other specific functionality that define what a system is supposed to accomplish. Behavioral requirements describe all the cases where the system uses the functional requirements; these are captured in use cases.
Nonfunctional Requirements: (NFRs) define system attributes such as security, reliability, performance, maintainability, scalability, and usability. They serve as constraints or restrictions on the design of the system across the different backlogs.
Functional requirements

- Registration
- User Login
- Creation of database: Users Mandatory Information

Design Constraints:

1. Database
2. Operating System
3. Web-Based Non-functional Requirements

Security:

1. User Identification
2. Login ID
3. Modification

Performance Requirement:

1. Response Time
2. Capacity
3. User Interface
4. Maintainability
5. Availability

SYSTEM REQUIREMENTS
Software Used:

- Python 3.9.0 or above, Kaggle and PyCharm

Hardware Used:

- I3 processor or above
- 150 GB Hard Disk or above
- 4 GB RAM or above

CONCLUSION

In this system, a machine-learning model was being prepared in order to predict whether a person has a heart disease or not. This model is based on a dataset that has 14 attributes directed at various people. The dataset was split for training and testing. Various machine learning algorithms were utilised to check the accuracy. Among all the algorithms, Random Forest is the best-suited algorithm, with an accuracy of 84%. Therefore, the model was trained using a random forest algorithm. The Flask web application framework was used to build the web application where the user can enter their information. Based on the user's input, the result will be displayed. If the person is predicted to have heart disease, an alert message will be sent.

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