**PROJECT REPORT**

**ON**

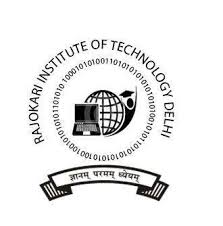
**HEART DISEASE PREDICTION USING MACHINE LEARNING**

SUMITTED FOR PARTIAL FULFILMENT OF DIPLOMA IN IT ENABLE SERVICES & MANAGEMENT

BY

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**VIth Semester**

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**Rajokari Institute of Technology**

**Department of Training and Technical Education, Delhi**

**DECLARATION**

I hereby declare that the project titled Heart Disease Prediction Using Machine Learning Submitted by me for Diploma in Information Technology Enable Service Management System VIth semester to Rajokari Institute of Technology, Department of Training and Technical Education, Delhi, comprises my own work and due acknowledgement has been made in text to all other material used.

Signature of Student……………………….

Name: Rahul kumar

Date: 25 April 2021

**Rajokari Institute of Technology**

**Department of Training and Technical Education, Delhi**

**CERTIFICATE FROM GUIDE**

It is to certify that the project Heart Disease Prediction Using Machine Learning submitted entitled, submitted by Mr./Ms. Rahul kumar to the Rajokari Institute of Technology, Department of Training and Technical Education, Delhi, has been completed under my supervision and the work is carried out and presented in a manner required for its acceptance to Diploma in Information Technology Enable Service Management System VIth semester.

Project Guide

Signature: ………………………..

Name: ………………………..

Date: ………………………..

**Abstract**

This report represents the mini-project assigned to seventh semester students for the partialfulfillment of COMP 484, Machine Learning, given by the department of computer science and engineering, KU. Cardiovascular diseases are the most common cause of death worldwide over the last few decades in the developed as well as underdeveloped and developing countries. Early detection of cardiac diseases and continuous supervision of clinicians can reduce the mortality rate. However, it is not possible to monitor patients every day in all cases accurately and consultation of a patient for 24 hours by a doctor is not available since it requires more sapience, time and expertise. In this project, we have developed and researched about models for heart disease prediction through the various heart attributes of patient and detect impending heart disease using Machine learning techniques like backward elimination algorithm, Random Forest Classifier Andric on the dataset available publicly in Kaggle Website, further evaluating the results using confusion matrix and cross validation. The early prognosis of cardiovascular diseases can aid in making decisions on lifestyle changes in high risk patients and in turn reduce the complications, which can be a great milestone in the field of medicine.

Keywords: Machine Learning, Random Forest Classifier, Cross-Validation, Backward Elimination, REFCV, Cardiovascular Diseases.

**HEART DISEASE**

Introduction

According to the World Health Organization, every year 12 million deaths occur worldwide due to Heart Disease. The load of cardiovascular disease is rapidly increasing all over the world from the past few years. Many researches have been conducted in attempt to pinpoint the most influential factors of heart disease as well as accurately predict the overall risk. Heart Disease is even highlighted as a silent killer which leads to the death of the person without obvious symptoms. The early diagnosis of heart disease plays a vital role in making decisions on lifestyle changes in high-risk patients and in turn reduce the complications. This project aims to predict future Heart Disease by analysing data of patients which classifies whether they have heart disease or not using machine-learning algorithms.

Motivation

Machine learning techniques have been around us and has been compared and used for analysis for many kinds of data science applications. The major motivation behind this research-based project was to explore the feature selection methods, data preparation and processing behind the training models in the machine learning. With first hand models and libraries, the challenge we face today is data where beside their abundance, and our cooked models, the accuracy we see during training, testing and actual validation has a higher variance. Hence this project is carried out with the motivation to explore behind the models, and further implement Random Forest Classifier model to train the obtained data. Furthermore, as the whole machine learning is motivated to develop an appropriate computer-based system and decision support that can aid to early detection of heart disease, in this project we have developed a model which classifies if patient will have heart disease in ten years or not based on various features (i.e., potential risk factors that can cause heart disease) using Random Forest Classifier. Hence, the early prognosis of cardiovascular diseases can aid in making decisions on lifestyle changes in high-risk patients and in turn reduce the complications, which ca n be a great milestone in the field of medicine.

Objectives

The main objective of developing this project are :

1. To develop machine learning model to predict future possibility of heart disease by implementing RandomForestClassifier.

2. To determine significant risk factors based on medical dataset which may lead to heart disease.

3. To analyse feature selection methods and understand their working principle.

4. The main objective of this research is to develop a heart prediction system. The system can discover and extract hidden knowledge associated with diseases from a historical heart data set

5. Heart disease prediction system aims to exploit data mining techniques on medical data set to assist in the prediction of the heart diseases.

6.Provides new approach to concealed patterns in the data.

7.Helps avoid human biasness.

8.Reduce the cost of medical tests.

System Requirement

* + Software requirements

Operating System Any OS with clients to access the internet

Jupyter notebook

Pandas

Numpy

Scikit learn

Seaborn

Python 3

Flask

Heroku

* Hardware requirements

For application development, the following Software Requirements are:

Processor: Intel or high RAM: 1024 MB

Space on disk: minimum 100mb

For running the application:

Device: Any device that can access the internet

Minimum space to execute: 20 MB

The effectiveness of the proposal is evaluated by conducting experiments with a cluster formed by 3 nodes with identical setting, configured with an Intel CORE™ i7-4770 processor (3.40GHZ, 4 Cores, 8GB RAM, running Ubuntu 18.04 LTS with 64-bit Linux 4.31.0 kernel)

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