

# VISUALIZING AND PREDICTING HEART DISEASES WITH AN INTERACTIVE DASHBOARD

## Introduction

*Heart disease defines a range of conditions that affect human heart. The name "heart disease" is often used commonly with the name "cardiovascular disease". Heart disease is a term that allow to a large number of medical circumstances related to heart. These medical circumstances characterize the irregular health condition that directly affects the heart and all its parts. Heart disease generally allows to some conditions that involve narrowed or blocked blood vessels which can lead to a heart attack, stroke or chest pain. Other heart conditions, such as those that affect your heart's muscle, valves or rhythm, also are considered forms of heart disease .There are various types of cardiovascular disease. The most similar types are heart failure (HF) and Coronary Artery Disease (CAD). The main root cause of heart failure (HF) is occur due to the blockade or narrowing down of coronary arteries. Coronary arteries also supply blood to the heart. Data mining is a non trivial extraction of implicit, previously unknown potential useful information called as knowledge from the medical data using complex algorithms. Big data (BD) can be referred as huge record of information set. Big Data and Data Mining are two various things. The task carried out by these two methods are similar focusing on collecting the huge amount of data, handling them and preparing report on the data by taking out the information which is knowledgeable. Data Mining is basically an activity of observing the patterns in the data which is relevant and with particular information by using Big Data. The useful patterns with hidden patterns, unknown correlations are analytically handled for making knowledgeable decision through this Big Data analytics process.*

## Literature Review

*[1] Bo Jin, Chao Che et al. (2018) proposed a “Predicting the Risk of Heart Failure With EHR Sequential Data Modeling” model designed by applying neural network. This paper used the electronic health record (EHR) data from real-world datasets related to congestive heart disease to perform the experiment and predict the heart disease before itself. We tend to used one-hot encryption and word vectors to model the diagnosing events and foretold coronary failure events victimization the essential principles of an extended memory network model. By analyzing the results, we tend to reveal the importance of respecting the sequential nature of clinical records.*

**Advantages:** *Get data of patients known to have heart disease. This dataset contains information related to heart diseases like blood sugar, cholesterol and other medical information about the individual.*

**Disadvantages:** *HD prediction model can be trained only 303 data of HD patient due to difficult of collecting Nepalese heart patient data but in future, we will collect large data and train model with their high accuracy.*

**[2]** *Regarding the above issues, we are proposing a web-based HDPS that is one of the best solutions to efficiently and accurately predict the HD patients. The proposed system eliminates the various testing of HD and supports the decision making of doctors. This system can accept a singleton query and display the clear output of the presence of HD level. This system is useful for any hospital and clinic to evaluate the patient getting a HD. It is reduced the number of tests and provide an efficient output of patient HD. It supports to make the decision of doctors that consultates with their patients easily.*

**Advantages:** With the consideration of WHO statistical facts, the most powerful causes of death globally are a HD. It seemed to the negligence of patients as well as doctors to increase a HD patient. Some of the difficulties to execute the doctor's decision and lack of application to clearly diagnosis of HD become the cause of human death.

**Disadvantages:** The main problem will be built a classifier model that will predict if it is getting HD or not it means how to train the classifier model so that the system will get exact if the patient is possessing HD or not that is the main challenge of this project.

**[3]** The proposed system will support the healthcare systems as well as health-related application to expand their services with efficiently and accurately providing results. It mitigates the time to checkup of doctors. With the consideration of WHO statistical facts, the most powerful causes of death globally are a HD. It seemed to the negligence of patients as well as doctors to increase a HD patient. Some of the difficulties to execute the doctor's decision and lack of application to clearly diagnosis of HD become the cause of human death.

**Advantages:** In the survey of this project, the interview of HD doctors will difficult to conduct due to their busy time schedule. Thereby it will make hard to identify the right attribute of the HD.

**Disadvantages:** Due to lack of spare time of doctor, we were unable to collect more data about HD. lack of time constraint, we were unable to explore other features to include the system and explore different heart disease type prediction.

**[4]** We were able to research or investigate our topic by conducting literature review as domain and technical research. At domain research, we achieved 13 important attributes of HD that every researcher had done their research to predict the HD. we also achieved an appropriate two algorithm to provide high accuracy in heart disease dataset.

**Advantages:** This system resolves the real-environment problem. It is successfully predicted the presence of HD in patient. It is also store and manage the prediction report of heart patient by doctor account. Admin user can handle create doctor account, mange doctor account and view the report of the patient.

**Disadvantages:** For the implementation of the HDPS, we faced the problem of accuracy of algorithms due to the result has three-level, that's why data is distributed and give low accuracy. So, we chose Kaggle dataset of HD which have two results. Again, we faced the problem of low accuracy of DT and NB.

**[5]** We made the line of research boundary to complete this project by planning the system requirement and planning. System requirement and planning consists of aim, objective, deliverables, and target audience of the system. We conducted the literature review by studying various journal papers and articles to understand the way of solving the problem as well as collecting important attributes of HD that lead role of the HD in patient. we will also apply this model into a mobile app to easily test ourselves HD. we will integrate smart wear to the hospital and police emergency system to save the life of the patient at the emergency condition.

**Advantages:** After identifying the problem statement, we strived to find a way of solving the problem through ML. After that, we conducted requirement analysis and planning of the system.

**Disadvantages:** The overall testing was a success but there was unit testing had a problem. These were hard to solve the displaying error message of the system. In the future, we can solve that problem.

## **References:**

**[1]** *This page demonstrates the form of prediction HD that contains details about the patient's data.*

**[2]** *It has input validation to restrict the garbage input that displays error message within this form. Most of input data are dropdown list due to restricting the garbage input.*

**[3]** *Asthana, S., 2018. Essential libraries for Machine Learning in Python. [Online] Available at: <https://medium.freecodecamp.org/essential-libraries-for-machine-learning-in-python-82a9ada57aeb> [Accessed 08 02 2019].*

**[4]** *Bahrami, B. a. S. M., 2015. Prediction and Diagnosis of Heart Disease by Data Mining Techniques. Journal of Multidisciplinary Engineering Science and Technology (JMEST), 2(2), pp. 164-168. Chala Beyene, P. K., 2018. "Survey on Prediction and Analysis the Occurrence of Heart Disease Using Data Mining Techniques. International Journal of Pure and Applied Mathematics, 118(8), pp. 165-174. Dangare Chaitrali S., P. A. S. S., 2012. Improved Study of Heart Disease Prediction System using Data Mining Classification Technique. International Journal of Computer Applications (0975 – 888) , 47(10), pp. 44-48.*

**[5]** *Dwivedi, A. k., 2016. Evaluate the performance of different machine learning techniques for prediction of heart disease using ten-fold cross-validation. Springer. Edrawsoft, 2019. SSADM Diagram Software - Structured Systems Analysis and Design Methodology. [Online] Available at: <https://www.edrawsoft.com/SSADM.php> [Accessed 11 06 2019].*

