

# AI in HealthCare

## Automated Diagnose and Disease prediction

### DISEASETAP

Brief Technical Description:

Medicine and healthcare are the most two important part of our human lives.

Traditionally, medicine solely relied upon the discretion advised by the doctors. For example, a doctor would have to suggest suitable treatments based on a patient's symptoms. However, this wasn't always correct and was prone to human errors. With the advancements in computers and in particularly **Data Science**,

it is now possible to obtain accurate diagnostic measures. The most well-known application of Data science in healthcare are as follows,

medical imaging, drug discovery, genetics, predictive diagnosis and several others that make use of data science

#### What's Diseasetap?

Diseasetap is a service comprising of deep tech such as Disease prediction and Automated Diagnose, where it can read through a patient Blood test report or his Lipid profile and predict which disease, he is prone to along with the risk factor on which scale he is affected by the disease.

This predictive model uses historical data, learns from it, and finds patterns and generates accurate predictions from it. It finds various correlations and association of symptoms, finds habits, diseases and then makes meaningful predictions, this can predict the deterioration in patient's health and provide preventive measures and start an early treatment that will assist in reducing the risk of the further aggravation of patient health.

We are mainly using Machine learning algorithms and Data science tools such as

Python language: **Python** is a general-purpose language; it has the right tools/libraries.

Anaconda navigator: we are using **Anaconda Navigator** as a desktop graphical user interface (GUI) included in **Anaconda®** we are launching applications and using the conda packages, environments, and channels without using command-line commands.

Jupyter Notebook: we are using the **Jupyter Notebook** in Anaconda Navigator, we are creating and sharing documents that contain live code, equations, visualizations and explanatory text. Uses include: data cleaning and transformation, numerical simulation, statistical modelling, machine learning and much more.

## Libraries needed for the implementation of Code:

1. **numpy**: To work with arrays
2. **pandas**: To work with csv files and dataframes
3. **matplotlib**: To create charts using pyplot, define parameters using rcParams and color them with cm.rainbow
4. **warnings**: To ignore all warnings which might be showing up in the notebook due to past/future depreciation of a feature
5. **train\_test\_split**: To split the dataset into training and testing data
6. **StandardScaler**: To scale all the features, so that the Machine Learning model better adapts to the dataset

## In Disease prediction

We are taking the help of IoT devices, that are present as wearable devices that track heartbeat, temperature and other medical parameters of the users. The data that is collected is analysed with the help of data science. With the help of analytical tools, we are able to keep track of patient's circadian cycle, their blood pressure as well as their calorie intake. Other than wearable monitoring sensors, we can monitor a patient's health through home devices. For patients that are chronically ill, there are several systems that track patient's movements, monitor their physical parameters and analyse the patterns that are present in the data. It makes use of real-time analytics to predict if the patient will face any problem based on the present condition. Furthermore, it helps the doctors to take the necessary decisions to help the patients in distress.

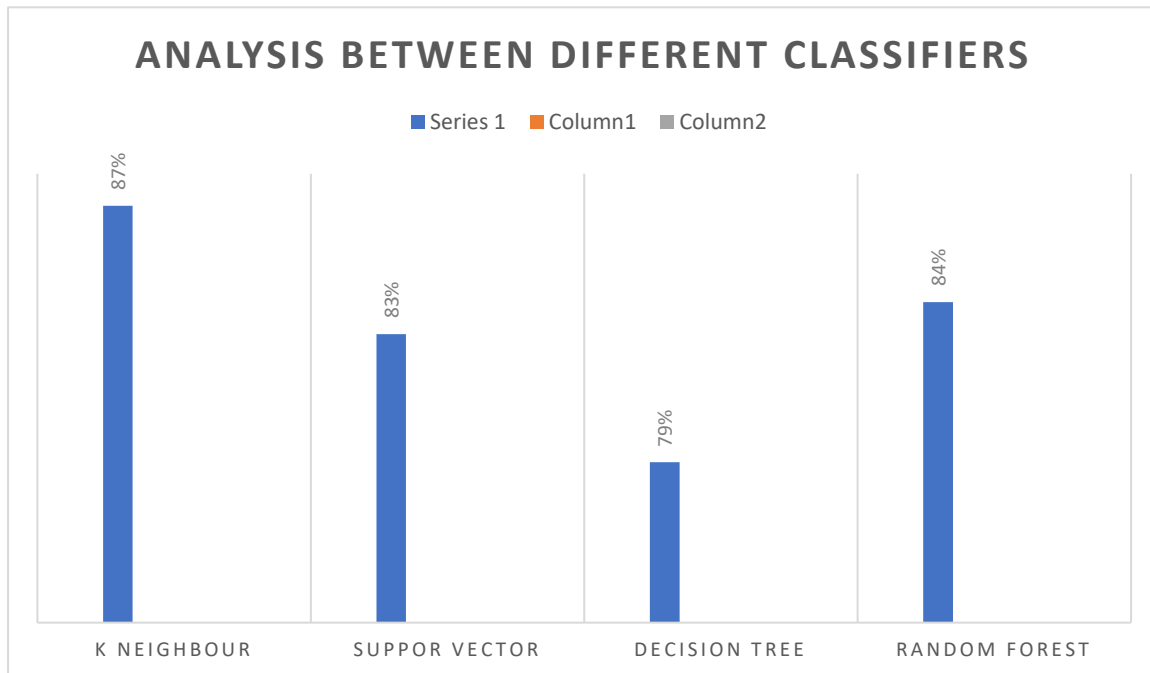
It plays a pivotal role in monitoring patient's health and notifying necessary steps to be taken in order to prevent potential diseases from taking place. we are using powerful predictive analytical tools to detect chronic diseases at an early level. In many extreme cases, there are instances where due to negligibility, diseases are not caught at an early stage.

## In Automated Diagnose

The primary and foremost use of automated diagnose in the health industry is through medical imaging. There are various imaging techniques like X-Ray, MRI and CT Scan. All these techniques visualize the inner parts of the human body. Traditionally, doctors would manually inspect these images and find irregularities within them. However, it was often difficult to find microscopic deformities and as a result, doctors could not suggest a proper diagnosis.

Now with the Technological enforcement of **deep learning technologies in data science**, we are now making it possible to find such microscopic deformities in the scanned images. Through image segmentation, it is possible to search for defects present in the scanned images. Other than this, there are also other image processing techniques like image recognition using **Support Vector Machines**, image enhancement and reconstruction, edge detection etc.

Our Heart Disease prediction Model:



1. K Neighbors Classifier: 87%
2. Support Vector Classifier: 83%
3. Decision Tree Classifier: 79%
4. Random Forest Classifier: 84%

### Conclusion AND FURTHER USE:

The analysis of the disease patient dataset with proper data processing. **4 models were trained and tested with maximum scores.**

We use this technology in wide range of Diseases to predict who are affected and their risk factor and we can cover a large number of patients at the same time with fast and efficient analysis. By using this we can improve patient care, chronic disease management and increasing the efficiency of supply chains and pharmaceutical logistics. Population health management is becoming an increasingly popular topic in predictive analytics. This is a data-driven approach focusing on prevention of diseases that are commonly prevalent in society.

With **Diseasetap**, hospitals can predict the deterioration in patient's health and provide preventive measures and start an early treatment that will assist in reducing the risk of the further aggravation of patient health. Furthermore, predictive analytics plays an important role in monitoring the logistic supply of hospitals and pharmaceutical departments.

This has many applications in healthcare. The medicine and healthcare industry have heavily utilized Data Science for the improving lifestyle of patients and predicting diseases at an early stage.