

International Conference - Innovation-2021-Innovation-2021 International Journal of Scientific Research in Computer Science, Engineering and Information TechnologyISSN : 2456-3307 (www.ijsrcseit.com) Volume 8, Issue 3, May-June-2021

# A Smart Digital Health Care Record with Prediction of Health Condition

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# ABSTRACT

Humans are known to be the most intelligent species on the earth and are inherently more health conscious. Since Centuries mankind has discovered various healthcare systems. To automate the process and predict diseases accurately machine learning methods are attending popularity in research community. We are implementing machine learning methodologies to identify the best-predicted values related to the patients in their respected health condition and also need to analyze the previous health records. The accuracy in prediction is achieved bymaintaining a repository or the warehouse wherein the digital data related to the patients and their treatment is maintained.

Keywords : Healthcare, Health Card, QR Code, Prediction, Methodology, Algorithms.

# I. INTRODUCTION

keep In this paper, we are proposing the health care system that stores the overall health information of the patient in a Digital card. This card will consist of all the medication details, reports etc. of the patient. The implementation of the project has done using Machine learning in python.

# Machine Learning

Machine learning is the main background of this prediction process and the data we acquired from the medical application. The information we gathered can be used for the machine learning models for better prediction of what is going to happen for the patient in future and what are the main constrains the patients have to follow if there are any problems with their health condition.[9][10]

# **II. LITERATURE SURVEY**

The table given below shows various existing system or models used so for in the context of fruit classifications.

Table i: Literature Survey Table

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		use and easy		
		interface.		
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# III. TAXONOMY CHART

The following table shows comparison between the existing system and our system. And gives the overview about what are the features are included in it.

	Table ii:	Taxonomy	Chart
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## **IV. SYSTEM ARCHITECTURE**

In system architecture how system works the collecting, flow and distribution of the data we get know in diagrammatic format in Fig.1.



Also the how the prediction algorithm system works also determined in Fig.2.



## FIG-1: SYSTEM ARCHITECTURE



#### FIG-2: PREDICTION ALGO. SYSTEM

# V. ALGORITHM

We have used two algorithms in our system like Decision Tree and Linear Regression. The decision tree is mainly used for the prediction of the disease and linear regression used for the health status accuracy in the numeric state. Implementation and explanation is determined below,

## A. Decision Tree Algorithm

A Decision Tree has influenced a wide area of machine learning, covering both classification and regression. In decision analysis, a decision tree can be used to visually and explicitly represent decisions and decision making. As the name goes, it uses a tree-like model of decisions. Though a commonly used tool in data mining for deriving a strategy to reach a particular goal, it's also widely used in machine learning.[11]as shown in the fig-.example.



Fig-3: Decision Tree Algorithm

#### Steps:

1.Import all the basic libraries required for the data,like

-import pandas as pd

- import numpy as np

2.Now we will import the csv files which contains the data of patients undergoing treatment to diagnose whether they have particular disease or not. The dataset is small so we will not discretize the numeric values present in the data. It contains the symptoms of the disease.

Let us read the data.

- df = pd.read\_csv('disease\_name.csv')

3.The dataset is normal in nature and further preprocessing of the attributes is not required. So, we will directly jump into splitting the data for training and testing.

-from sklearn.model\_selection import train\_test\_split

- X = df.drop('disease\_outcome',axis=1)

- y = df['disease\_outcome']

- X\_train, X\_test, y\_train, y\_test = train\_test\_split (X,y, test\_size=0.30)



Here, we have split the data into 70% and 30% for training and testing. You can define your own ratio for splitting and see if it makes any difference in accuracy.

4.Now we will import the Decision Tree Classifier for building the model. For that scikit learn is used in Python.

- from sklearn.tree import DecisionTreeClassifier
- dtree = DecisionTreeClassifier()
- dtree.fit(X\_train,y\_train)

5. Now that we have fitted the training data to a Decision Tree Classifier, it is time to predict the output of the test data.

- y\_pred = classifier.predict([disease\_name])

There are also two steps next to it in the algorithm like confusion matrix and model building and data visualization, but in our model there no need for that.



Fig-4: Flowchart for Decision Tree

## B. Linear Regression Algorithm

Linear regression is the simplest and most extensively used statistical technique for predictive modelling analysis. It is a way to explain the relationship between a dependent variable (target) and one or more explanatory variables(predictors) using a straight line.

Linear regression performs the task to predict a dependent variable value (y) based on a given independent variable (x).

## Steps:

1.Import the libraries that are necessary for the algorithm.

- import numpy as np

- import pandas as pd

2. Import the dataset. Here we in the dataset we have taken the data items(symptoms) from the disease datasets.

- dataset = pd.read\_csv('health\_status\_data.csv')

3.Seperate X and y variables form the dataset.

- X = df\_getdummy.drop('sum',axis=1)

```
- y = df_getdummy[sum]
```

4.Split the dataset into the Training set and Test set.

 from sklearn.model\_selection import train\_test\_split

- X\_train, X\_test, y\_train, y\_test = train\_test\_split(X,

y, test\_size = 0.25, random\_state = 0)

5.Feature scaling.

- from sklearn.preprocessing import StandardScaler

- sc = StandardScaler()
- X\_train = sc.fit\_transform(X\_train)
- X\_test = sc.transform(X\_test)

6.Fit Logistic Regression to the training set.

- from sklearn.linear\_model import LogisticRegression

```
-classifier = LogisticRegression(random_state = 0)
```

- classifier.fit(X\_train, y\_train)

7. predict the Test set results and accuracy of the result.

- y\_pred = classifier.predict(X\_test)



Fig-5: Flowchart for Linear regression

## VI. RESULT

We are going to see pages of the system(project) and also the disease prediction and health status of patientsalso the 3health card page.



Fig-6: Login page of our syste



Fig-7: Patient portal dashboard



Fig-8: Receptionist portal dashboard



Fig-9: Doctor portal dashboard



Fig-10: Admin Receptionist Approve portal dashboard

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Fig-11: Admin User Query portal dashboard



Fig-12: prediction of disease(1)

The above fig.12 shows the recommendation box layout in green which shows that patient doesn't have the disease.

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Fig-13: prediction of disease(2)

The above fig.13 shows the recommendation box layout in red which shows that patient have the disease.





The above fig.14 shows the health status of the patient we have calculated by the linear regression algorithm in numeric format.





The above fig.15is the health card of our users like patient, receptionist and doctor.

# VII. ADVANTAGES

- 1. Accurate results of the diseases and the health status.
- 2. Easy to use interface of the system.

- 3. The health card is easy to carry anywhere and is citizencentric.
- 4. The data losing percentage by our system is less.

## VIII. LIMITATIONS

- 1. Sometimes if user does not fill the proper data, it does not give accurate prediction.
- 2. User needs to have internet connection for accessing the system.

## **IX. FUTURE WORK**

- **1.** To gives more interactive interface for our system.
- **2.** Using health dataset predict the future health condition of the patient in data visualization format.
- **3.** To give more accurate results in health status.

# X. CONCLUSION

The main purpose of this paper is to determine work on medical database with the help of digital card to store information and analyse. This research paper focuses on storing the patients' health information in the digital card, analysing and designing a system where patients real-time information can be processed and evaluated based on previous symptoms and on current symptoms for different diseases. By this paper we have concluded that Decision tree and Linear regression is the best algorithms with higher accuracy rate than others for predicting and analysis. This paper also outlines the technique to deploy this method to android and web platform to analyse and predict using real time data of users by collaborating with doctors and various medical organization.[5]

#### XI.ACKNOWLEDGEMENT

It gives us a great pleasure in presenting the paper on "A SURVEY ONSMART DIGITAL HEALTH CARE RECORD WITH PREDICTION OF HEALTH CONDITION". We would like to take this opportunity to thank Dr. PankajAgarkar, Head of Computer Engineering Department, DYPSOE, Pune for giving us all the help and support we need during course of the Paper writing work. We are really grateful to &Dr. Sunil Rathod for giving an opportunity to work with R&D cell of our department. Our special thanks to Dr. Ashok Kasnale, Principal DYPSOE who motivated us and created a healthy environment for us to learn in the best possible way. We also thank all the staff members of our college for their support and guidance.

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