IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.301
Volume 3, Issue 7, May 2023

Health Mitra : Digital Diagnose Suggestion and Disease Prediction using Machine Learning and Microsoft Azure

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Abstract: *Innovation has modified the wellbeing field generally in this period of IT. The objective of this exploration is to make a determination model for various illnesses in light of their clinical data. To make such a model, this framework system uses Random forest. The savvy specialist is prepared utilizing datasets containing abundant information in regards to patient sicknesses that have been accumulated, refined, ordered, and used. In the wake of arranging the dataset into preparing and testing we constructed a model utilizing a random forest classifier. Model can predict disease in view of clinical data of the patient. The patient could then contact the specialist for additional treatment in view of the outcomes by utilizing AI Chatbot*

Keywords: Random forest classifier, medical data, classification, and data mining, Microsoft azure, Microsoft cognitive service, knowledge base, AI Bot

I. INTRODUCTION

Even in the age of the internet and machine learning, we still treat diseases in the same manner. We develop a complete Machine Learning based healthcare system called Health Mitra as our response. It is a web application with a fantastic user-friendly GUI that was created with the aid of streamlet, an open source Python app framework, and a core concept that utilizes Microsoft Azure and machine learning. The suggested methodology here offers a better and more efficient substitute for randomly Googling a diagnosis and more correctly predicting disease than the traditional method.By only enrolling on a network, one may diagnose himself, receive the diagnosis, and find physicians' contact information. Using machine learning algorithms, HealthMitra is able to forecast and assist in the diagnosis of several diseases. A method for improving disease prediction accuracy can be created with the development of machine learning. Using existing medical information and Random forest. The patient can get in touch with the closest or dearest disease specialist with the aid of an AI Chatbot[4] for any additional therapies. This method enables free disease prediction and doctor consultation.

II. MOTIVATION

- Our innovation takes inspiration from ancient Indian civilization; We are living in a country where the medical field is far ahead at that time.
- Need of the user is an accurate diagnosis for a disease, cheaper cost, and ease of availability so as per the user requirement.
- Our innovation strictly follows the principle - high accuracy and cheap medical facility for everyone and also it can easily be accessible to everyone at no cost.
- With the help of this innovation we can make some positive changes in the medical field. .

III. METHODOLOGY

The diseases are expected naturally in the system utilizing a model, which has been prepared on a clinical dataset. This method additionally shows the prediction's score. Following the conclusion of the expected disease, the system suggests experts who spend significant time in that disease, permitting the patient to talk with them on the web.

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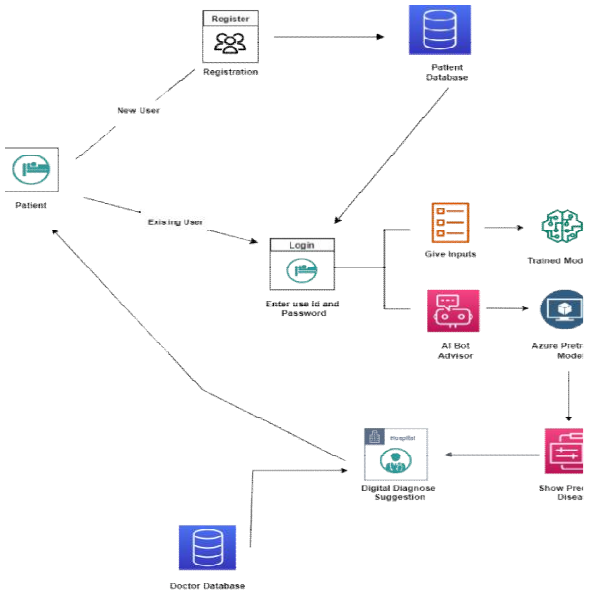

Fig1. Flow Diagram

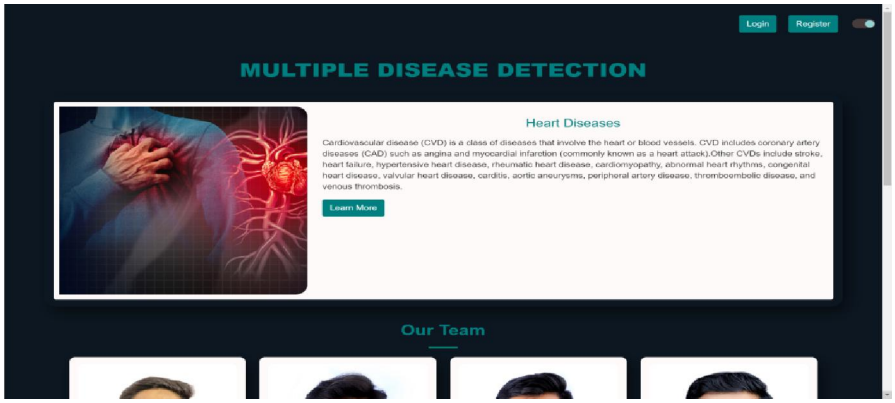

Fig 2. Home Page[1]

When clients visit this application, They can register as a patient . after the user has successfully registered on the network. They can login in this application as a patient.

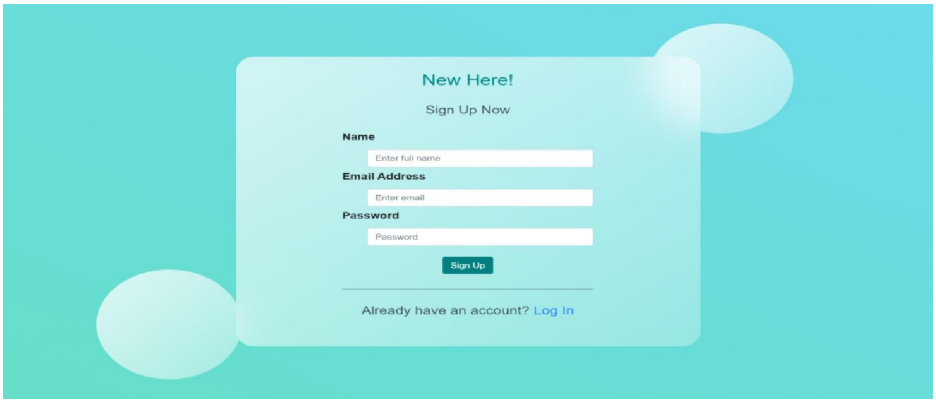

Fig 3. Registration page[1]

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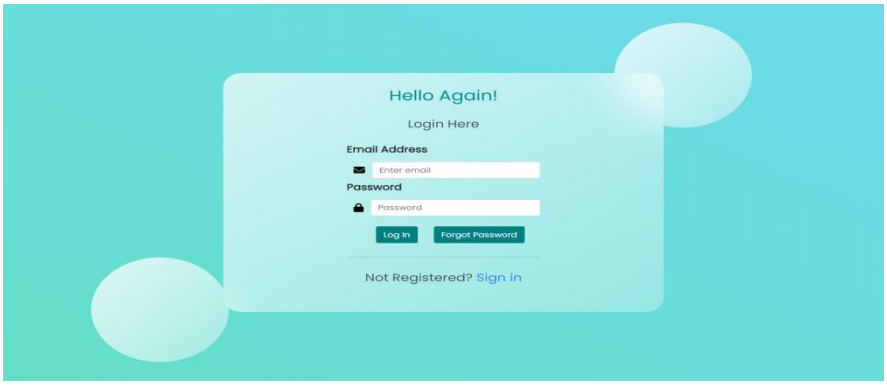

Fig 4. Login page[1]

After login as patient –

A) On profile page users can see their ID, name, and email. They can also edit their information..

B) There are three choices to- to predict the disease and consultation from AI Bot.

C) At the point when they click on predict disease they will get a choice to multiple disease from the sidebar.

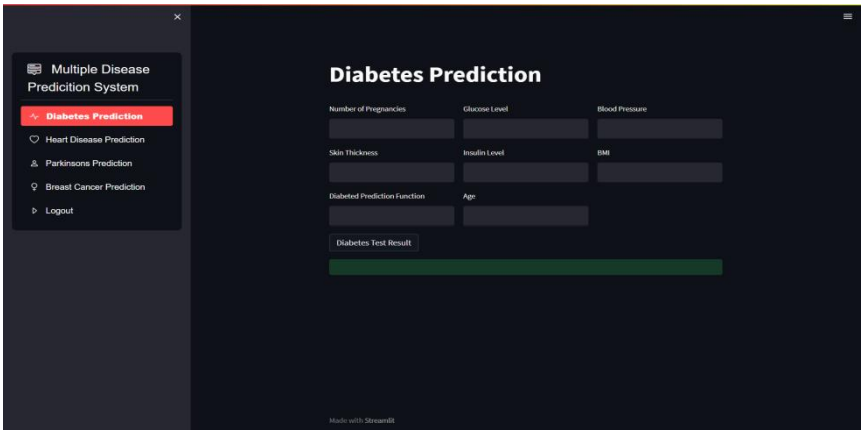

Fig 5. Sidebar option[1]

D) Depending upon the medical information of the patient, the model will predict the disease with high accuracy.

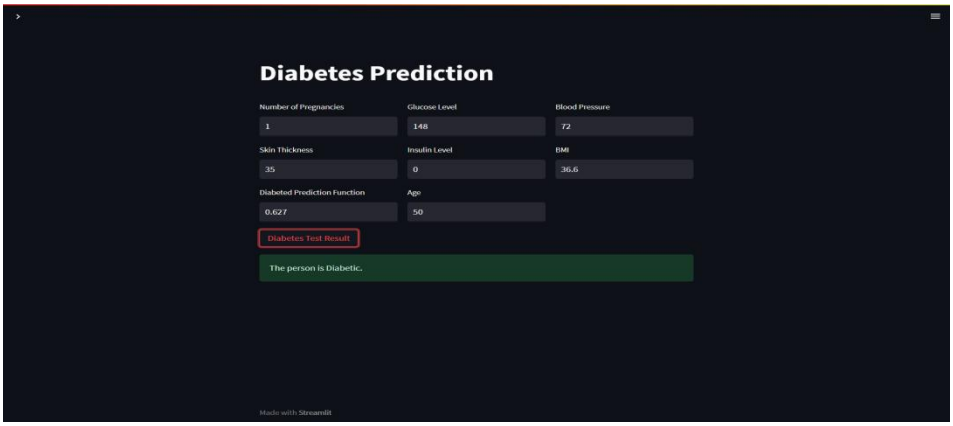

Fig 6. Disease test result[1]

E] This application gives a connection that will guide the patient for better understanding of the predicted disease.

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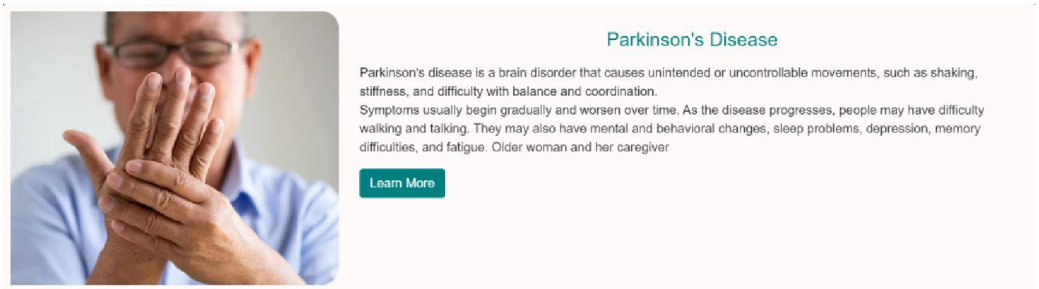

Fig 7. Information about disease[2]

F) Furthermore, the main element of the proposed model is that alongside the visualization the framework offers the chance to associate with the specialist representing considerable authority in that specific field to the client who is enrolled in the organization alongside their contact subtleties.

G) Patients can get to a rundown of specialists who have practical experience in their field with assistance of Azure[6] cognitive service based intelligence Chatbot, simulated intelligence Chatbot will assist patients to get specialist data with geographic area.

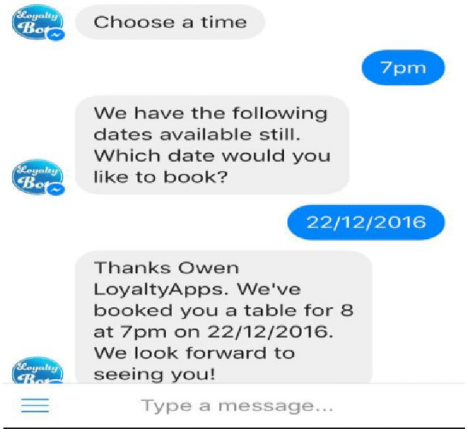

Fig 8. AI Chatbot

H) User can contact us 24x7 for any kind of query.

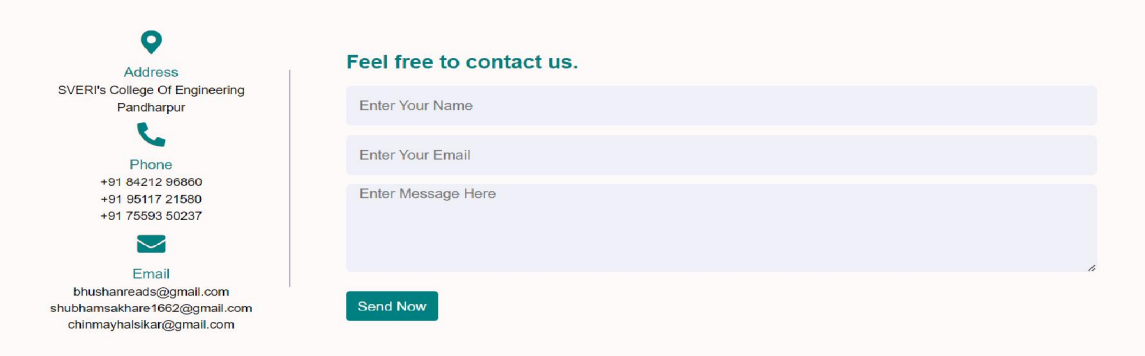

Fig 9. Contact form

4. Data Preparation: The dataset is available on the Kaggle[5]website . The classification goal is to predict whether the patient has 10-years risk of multiple diseases. Dataset provides the information of the patient.

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Out[ ]:

	Pregnancies	Glucose	BloodPressure	SkinThickness	Insulin	BMI	DiabetesPedigreeFunction	Age	Outcome
0	6	148	72	35	0	33.6	0.627	50	1
1	1	85	66	29	0	26.6	0.351	31	0
2	8	183	64	0	0	23.3	0.672	32	1
3	1	89	66	23	94	28.1	0.167	21	0
4	0	137	40	35	168	43.1	2.288	33	1

Fig 10. Dataset

5. Cleaning the Data:

This is the most important stage in machine learning .Model quality of the model depends on the quality of the data. Data is cleaned before using it for the training of models. The sections in the dataset are all mathematical, with the exception of the objective segment, visualization, which is a literary sort that is encoded to mathematical structure utilizing a name encoder.

6. Dataset Splitting:

Dataset is separated into two:

Training dataset and Testing dataset.

Data is divided into an 4:1 format, which means 80% of the information is utilized for training the model and remaining 20% is used to calculate the model's performance.

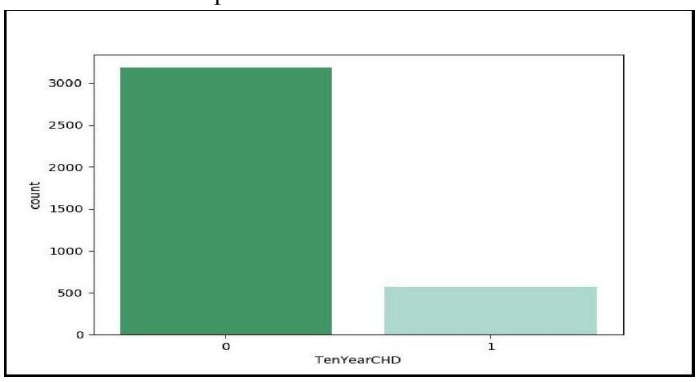

Fig 11. Dataset splitting[2]

7. Random Forest Classifier: Random forest contains a large number of single decision trees which operate as an ensemble. Every tree in the random forest produces a hypothesis, to fabricate a far reaching model two different factors are combined.

IV. RESULT

When the patient is signed in, they will be able to do prediction of disease. This guarantees consistent a single tick answer for get an currect prediction

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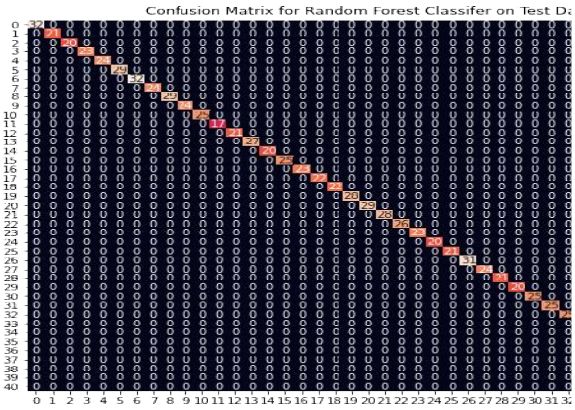

Fig 12. Accuracy on the train data by Random Forest Classifier.

The high precision results as well as this ensures that not one clinical data element is subsidiary to disease prediction and the result is not biased.

V. FUTURE SCOPE

- Prime account option is available .We can add Video calling feature .
- The site's record connecting highlight permits clients to connect their record with other internet based administrations like Gmail and web-based entertainment.
- Map element to the site, such as adding a Programming interface for it. E. Cooperate with a drug store and furthermore give limits on the medication.

VI. CONCLUSION

The machine learning model we have assembled is around 90% to 97% exact. The diseases for which there are no diagnostics strategies. Machine learning models can anticipate regardless of whether the individual has illness. This is the power of machine learning technology by utilizing which a large number of present reality issues can be solved.

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