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Brain Tumor Detection and Diet Prediction

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ABSTRACT:

We mean to include the new method for developing dietary as evaluation strategies, which is a more beneficial method for controlling dietary models and overseeing screen-verifiable food affirmation. Social classes can use the food, calorie, and food appraisal framework to check and manage their consistent food insistence. PC-based information will make recommendations based on the things that the client likes or has always valued. Additionally, these calculations are used to suggest foods that the customer might like. The client's supportive equilibrium is met by the food that is suggested and the food in standard plans that are set by the client. We include the question of proof of a real eating plan that should satisfy everyone's supporting fundamentals. We are also separating pneumonia from other infections like cerebrum growth and cellular breakdown in the lungs. We give the client the information from the medical clinic, and the client can schedule a meeting with a specialist. We will be performing a variety of calculations in this task, including irregular backwoods, convolutional brain organization, and k closest area. We used the CNN model to get an accuracy of 92.58 percent for this project. Additionally, we have advised the user to take precautions if they have a tumor. The diet for these diseases is suggested in the second module.

Keywords – Convolutional Neural Network , Random forest , k-Nearest neighbours

INTRODUCTION

The significance of diet the board has unquestionably increased in this turbulent world. Diet-related infections are spreading at an unprecedented rate as a result of shocking and unpredictability in dietary models. Over two out of every 100 people in India suffer from the terrible effects of diabetes, and 32 out of every 100 people suffer from the wise effects of heart disease. Today, a large number of diet-related applications and plans are available. Even though changing your eating habits is becoming more and more important, the people you see today really need to feel good. Clients can use this app to manage their individual diets based on a variety of individual variables, such as BMI, hypersensitivity, infections, and so on. This project's objective is to build a framework that will allow the company's customers to receive nutritionally appropriate admission based on their preferences. In addition, our framework will consider the client's proactive tasks throughout the day and recommend an appropriate eating schedule for them. Additionally, the clients will receive information about supplements and occasional access to food items from our framework. A healthy way of life includes eating food that has been modified. A healthy eating routine is just as important to a person's well-being as regular physical activity. However, despite the ever-increasing pace of the current tasks, health and nutrition are frequently overlooked. This application intends to provide precise information regarding intermittent accessibility, which is a significant issue in India. The client's previous states will be taken into consideration, and the application will only provide important data in accordance with the condition. Customers can create profiles to keep track of their eating habits, and our project will also take into account their dietary requirements. Based on the client's advantages, recommender frameworks aim to obtain significant information. The ability to keep up with the dataset and retrieve client-relevant information is a crucial issue for recommender frameworks. A common arrangement is to follow the client's preferences and present relevant results, but this is a difficult task in terms of life. It is necessary to analyze the client data and learn how to use accurate calculations. The recommender frameworks are increasingly playing a significant role in everyday activities, academic coursework, and individual lives. A data sifting framework, the Recommender framework channels the data based on the client's preferences or actions. In most cases, recommender frameworks are based on unfiltered information provided by the client during the initial proposal phase. The application then tracks the client's actions and provides customized suggestions. The task of recovering and purchasing information is of paramount importance. We have suggested including a text corpus in the dataset to make this cycle work. The auto-taggers may benefit from the organization of the dataset's data. At first, this model acquires the client's unfiltered data. The client's profile is updated and the information is provided to them based on their actions. There are a lot of tools in recommender frameworks that can point the customer in the right direction. Depending on the client's actions, these devices provide information or recommendations to the client. The primary reason that many aggregates employ suggestions is to generate revenue. When compared to the deals that were made in the past without recommenders, insights have shown that the organization's use of proposal frameworks significantly increased those deals. The human brain excels at gathering information, whereas machines excel at transferring and manipulating data.

Literature Review

1. AHMAD A. RACIEL YERA "A food recommender framework thinking about dietary data and client inclinations," ALZAHRANI, LUIS MARTNEZ, Vol. 4, 2016 Software engineering Division, College of Jaén. Instead of previous works that lack this global perspective, this paper presents a comprehensive system for daily dinner plan proposals that incorporates the concurrent administration of wholesome mindful and inclination mindful data as a fundamental component. The proposal includes a pre-sifting step that uses AHPSort as a multi-standards choice investigation tool to filter out food sources that don't meet the current customer's needs. In addition, it incorporates a development-based stage for the creation of a daily meal plan with the goal of suggesting foods that the client enjoys a lot but hasn't eaten in a while and meeting their daily health needs.

2. "Towards Creating Type 2 Fluffy Rationale Diet Suggestion Framework for Diabetes" was written by Hani Hagras and Heba Abdelgader Mohammed. It was published in the Data Framework Division of the School of Science and Workmanship Ruler Khalid College in Abha, Saudi Arabia. In order to assist in achieving a healthy way of life and keeping the infection under control, our ongoing efforts to develop a sort 2 fluffy rationale-based diet proposal framework for diabetes are presented in this paper. Diabetes diet advice has utilized a variety of approaches. Nonetheless, there must be a method for addressing the potential dangers posed by shifting individual sentiments and preferences. Additionally, it is challenging for medical professionals to physically decipher large volumes of blood glucose data in order to tailor treatment to each patient's requirements. Diabetes should be treated more effectively with diet and exercise modifications, which can help patients avoid serious problems.

3. "Fluffy based approach for diet expectation," Worldwide Diary of PC Applications, 2019, by Arushi Singh, Nandini Kashyap, and Rakesh Garg. Using information gathered from a variety of sources, a method is developed in this work to create a healthy eating plan for people of all ages. Depending on the client's age group, a diet plan will be developed by calculating the necessary amounts of starches, nutrients and minerals, milk protein, meat protein, fat, and sugar. The widely held rationale known as "fluffy" incorporates a variety of data and outcomes in addition to part capability. A fluffy rationale method that demonstrates the precisely adjusted diet for each age group will be proposed in the work.

4. "Information Mining Way to Deal with Chinese Food Examination for Diet-Related Cardiometabolic Illnesses" was presented at the 2019 IEEE 35th Global Meeting on Information Designing Studios (ICDEW) by Angela CHANG, ieyi HU, Yichao LIU, Matthew, and Tingchi LIU. The emerging information mining system is one of the primary objectives of this study, which aims to comprehend the structure of how the news media discuss diet, food, and cardio-metabolic diseases. In addition to cardio-metabolic infections, a total of 6,625 flavors, toppings, and food additives are identified. Calculations for information gathering concern nutrition for predicting health outcomes and providing approach data. A food information corpus is most frequently used for programmed change from text to health concerns for larger social powers.

Fenglong Mama, Qiuling Suo, and others [5] Said that introducing a sophisticated time-combined CNN system would simultaneously learn patient depictions and measure pairwise likeness. Our time combination CNN, in contrast to the conventional CNN, is able to learn both the commitments from each time period and the local fleeting connections. The likelihood circulation data, in addition to the similarity educational experience, are used to rank comparable patients.

Prabakaran.N. and Kannadasan et al. [6] compare information about late medical care to information from that particular standard dispersion and, as a result, characterize subgroups of the information that is provided. In addition, the information used for the test is first evaluated against a variety of classifiers and other proposed test scores.

A sentence likeness model was proposed by Peiying zhang, Xingzhe huang, et al. [7] to conduct side effect comparability research for basic sickness prediction and early intervention. This model makes use of word installation and convolutional brain organization (CNN) to extract a sentence vector that contains watchword data about the patient's feelings and side effects. This model integrated the syntactic tree and brain network into the calculation interaction to improve sentence closeness calculation precision. Utilizing a side effect comparability investigation model for infection detection and early treatment is our primary innovation. Furthermore, one of the advancements is the SPO bit.

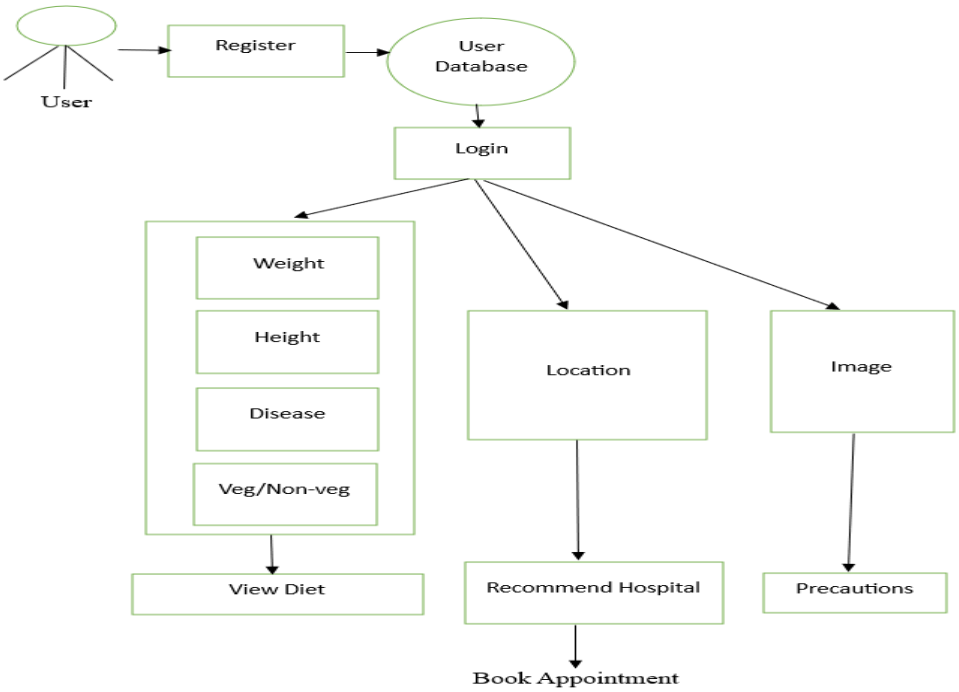

Fig 1.Architecture diagram

System Development

1. Algorithms

1.CNN

The CNN model's four main components—input, capturing, classification, and output—are depicted in the diagram below. There are numerous components in this image, with three primary processing components: initialization and configuration, CNN learning and visualization, and sample test selection. The instance and configurations are the two inputs for the Configurations and Initialize component. To begin, the instance explains the classification method, the size of the input images, the number of filters on each convolution layer, the names of the layers, and the kernel of the layers. Lastly, the model's learning rate, mini-batch, momentum, and weight decay are all described in the configuration. The nLmF-CNN CNN Learning and Visualization component describes image features across a variety of layers, including the input, conv, relu, pool, fc, and softmax layers. It shows the current learning status result, as shown in fig. 2. A convolution results in a include map or convolved highlight, which can be of a different size and depth than the information highlight map by removing tiles from the guide and applying channels to them to register new elements. Two boundaries distinguish convolutions: the size of the removed tiles (typically 3x3 or 5x5).

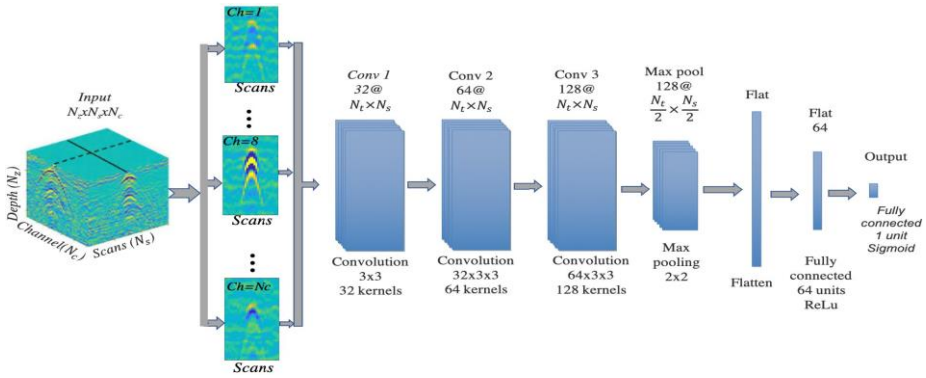

Fig.2 CNN Architecture

The depth of the resulting include map is proportional to the number of channels used. During a convolution, channels (frameworks of the same size as the tile size) slide evenly and upwardly over the information highlight guide's matrix, removing each corresponding tile at a time with each pixel. To introduce nonlinearity into the model, the CNN applies a Corrected Straight Unit (ReLU) change to the convolved highlight following each convolution activity. F(x)=max(0,x), a ReLU capability, returns x for all upsides of x greater than zero and 0 for all upsides of x less than zero. In various brain organizations, ReLU is used as an enactment capability. Following ReLU is a pooling step in which the CNN down examples the convolved highlight to save handling time and reduce the number of elements in the component map while still protecting the most fundamental element data. Max pooling is a

common calculation used for this cycle. Max pooling functions similarly to convolution. We concentrate tiles of a predetermined size by sliding over the element guide. The highest value for each tile is transferred to another component guide, and any remaining qualities are discarded. Tasks that use max pooling have two boundaries. Size of the maximum pooling channel (typically 2x2 pixels) A convolutional brain network typically has at least one layer that is completely associated (when two layers are "completely associated," each hub in the primary layer is associated with each hub in the subsequent layer). This occurs toward the network's conclusion. It is their responsibility to arrange the elements that have been freed by the convolutions. A softmax enactment capability typically resides in the final fully associated layer and assigns a likelihood value between 0 and 1 to each of the characterization marks that the model is attempting to predict.

2.Random Forest

An artificial intelligence technique called an irregular timberland is used to deal with issues with order and relapse. It employs group realizing, a method for combining multiple classifiers to provide answers to difficult questions. Numerous choice trees make up an irregular woodland calculation. Through packing or bootstrap totaling, the "backwoods" created by the irregular timberland calculation is prepared. Packing is a group meta-calculation that relies on AI calculations for accuracy. The (arbitrary) backwoods calculation shows the result in light of what the choice trees expected. It makes predictions by using the normal, or mean, of various trees' results. The result's accuracy improves as the number of trees increases.

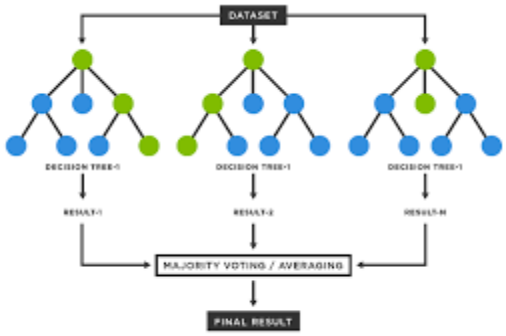

Fig3. Random forest Architecture

3. KNN

A refinement of the k-NN portrayal estimation is to check the responsibility of all of the k neighbors as demonstrated by their distance to the request point, giving more unmistakable burden to closer neighbors. The KNN classifier suggesting the hospital to user for subject to the nearest distance.

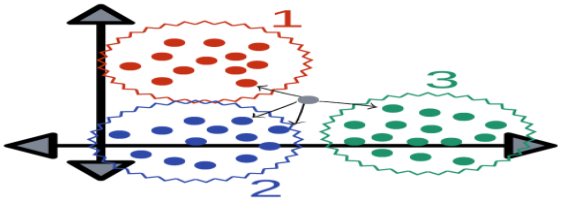

Fig4. KNN Architecture

$d=\sqrt{((x2-x1)^2+(y2-y1)^2)}$

d=distance

x1, x2, y1, y2 = data points

Results and Discussion

The model is executed utilizing deep learning and OpenCV. Our proposed method achieves the 92.58% accuracy for 100 epochs through a CNN algorithm. We have extracted the 128 features from image using CNN algorithm. After detection we are also trigger to nearest hospital by KNN algorithm. In this project we have trained the random forest classifier for diet recommendation.

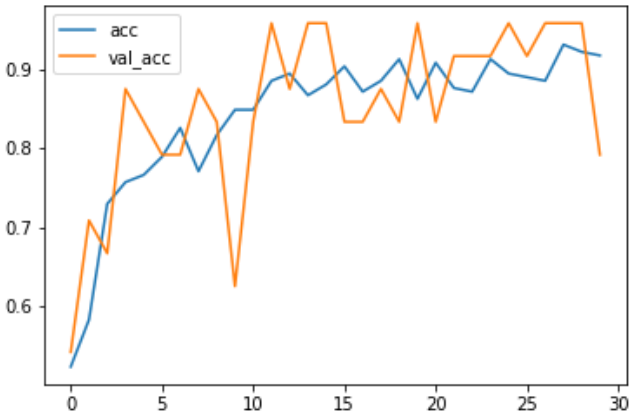

Fig.5 Accuracy Graph

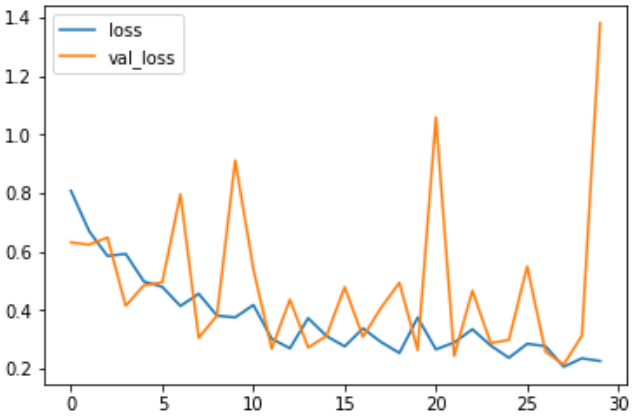

Fig.6 Loss Graph

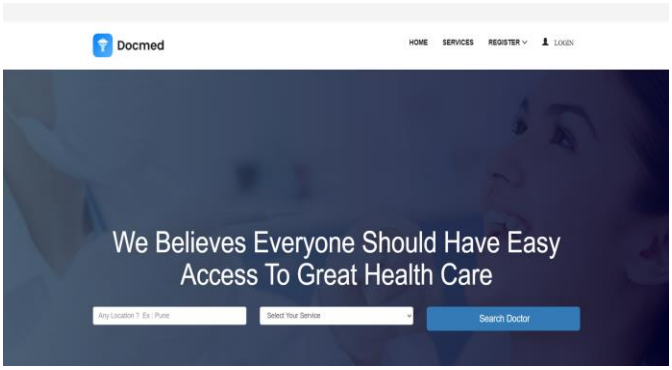

Fig.7 Home Page

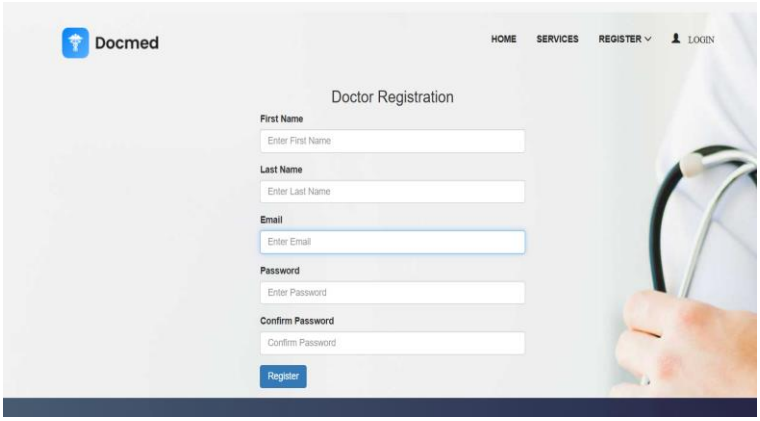

Fig.8 Doctor Home Page

Fig.9 Patient Home Page

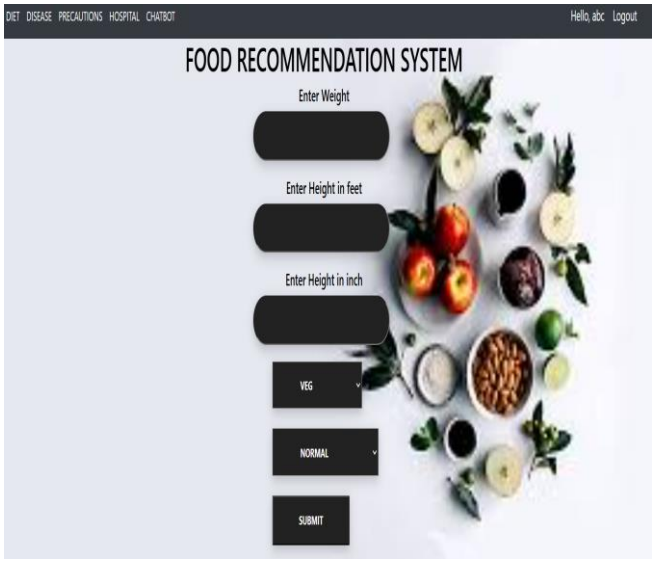

Fig.10 Diet Home Page

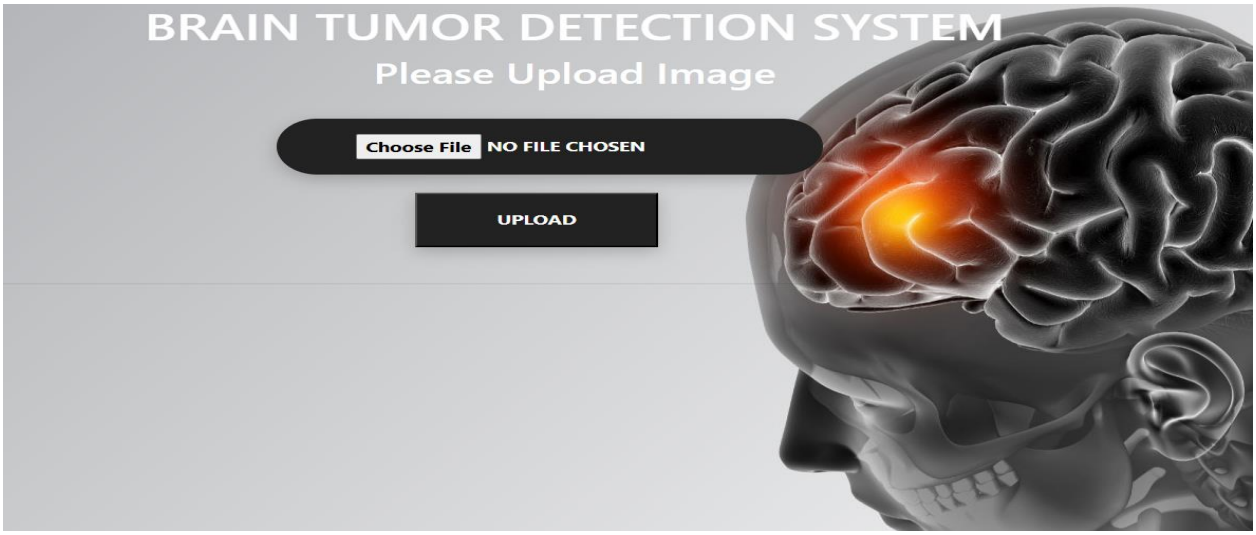

Fig.12 Disease Home Page

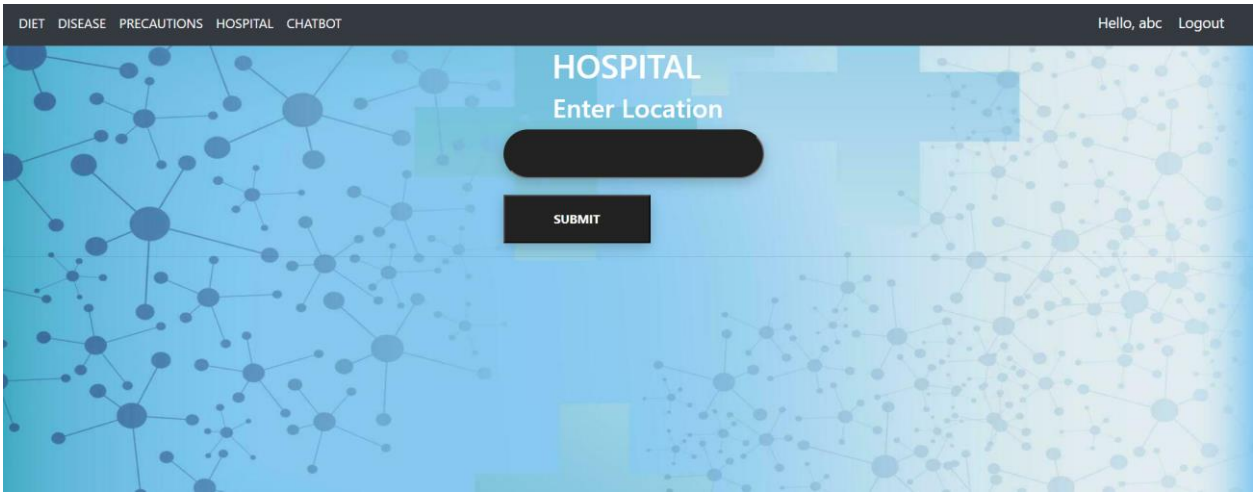

Fig.13 Hospital Home Page

Fig.14 Chatbot Home Page

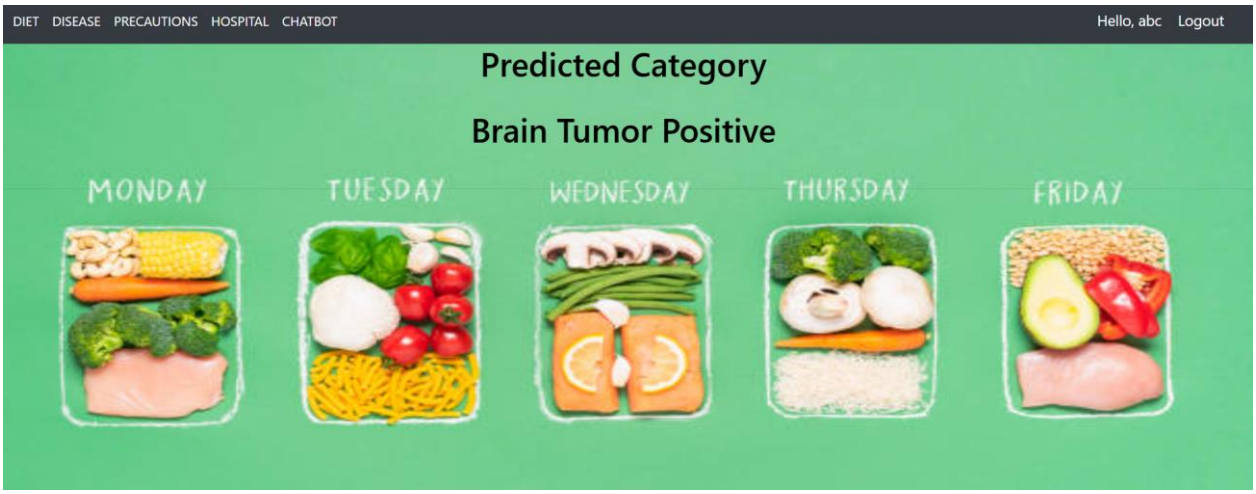

Fig.15 Prediction Page

Fig.16 Hospital Recommendation Page

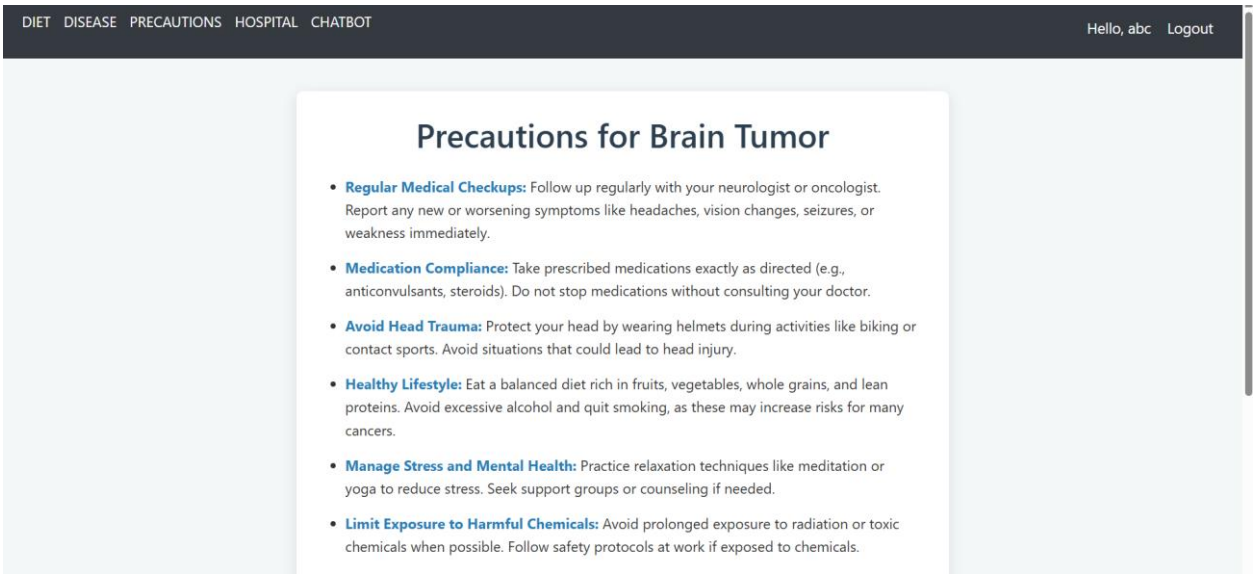

Fig.17 Precautions Page

Conclusion

The task is made up of a number of modules that are meant to find diseases and suggest ways to treat them. Through a Convolutional Brain Organization (CNN), Module 1 focuses on identifying serious medical conditions like mind growths, cellular breakdown in the lungs, pneumonia, and jungle fever. This module not only identifies these diseases but also provides significant results, such as patient-specific dietary recommendations and safety precautions. Module 2 suggests suitable weight control plans based on a patient's Weight Record (BMI) and any current illnesses using an irregular timberland calculation. This individualized diet advice aims to assist patients in effectively managing their health. Using a K-Closest Neighbors (KNN) calculation, clinic proposals based on the patient's location are the focus of Module 3. Patients will be able to easily locate open clinical considerations in their area thanks to this component. Finally, an arrangement framework to assist with the scheduling of clinical visits is included in Module 4. These modules, taken together, form a comprehensive health management system that provides fundamental information on the disease spectrum, dietary guidance, clinic options, and flexible admission to enhance patient care. In this project, we also suggested taking precautions against bone tumor disease and changing your diet. Additionally, we designed the chatbot for user interaction.

REFERENCES :

1] Anonnya Banerjee, Alaa Noor, Nasrin Siddiqua “Food Recommendation using Machine Learning for Chronic Kidney Disease Patients” 2019 International Conference on Computer Communication and Informatics.

2] 1 Akash Maurya,2 Rahul Wable,3 Rasika Shinde “Chronic Kidney Disease Prediction and Recommendation of Suitable Diet plan by using Machine Learning” 2019 International Conference on Nascent Technologies in Engineering (ICNTE 2019).

3] Heba Abdelgader Mohammed “Towards Developing Type 2 Fuzzy Logic Diet Recommendation System for Diabetes” 2018 International Conference on Computer, Control, Electrical, and Electronics Engineering (ICCCEEE).

4] Celestine Iwendi, Joseph henry "Realizing an Efficient IoMT-Assisted Patient Diet Recommendation System Through Machine Learning Model" SPECIAL SECTION ON DEEP LEARNING ALGORITHMS FOR INTERNET OF MEDICAL THINGS.

[5] Mircea Gurbin, Mihaela Lascu, and Dan Lascu "Tumor Detection and Classification of MRI Brain Image using Different Wavelet Transforms and Support Vector Machines" 2019 IEEE.

[6] S. Somasundaram, R. Gobinath "Early Brain Tumour Prediction using an Enhancement Feature Extraction Technique and Deep Neural Networks" International Journal of Innovative Technology and Exploring Engineering (IJITEE).

[7] K.Melbin, Dr.Y.Jacob Vetha Raj "Brain Tumor Detection and Classification Using Convolutional Neural Network and Deep Neural Network" University College London. Downloaded on July 04,2020 ©20XX IEEE.

[8] squenazi, Yoshua, Victor P. Lo, and Kiwon Lee**.** "Classification of Brain Tumor by Combination of Pre-Trained VGG16 CNN" University of Tehran, Faculty of Management 10.22059/jitm.2020.75788.

[9] Avigyan Sinha, Aneesh R P, Malavika Suresh, Nitha Mohan, Abinaya D, Ashwin G Singerji "Brain Tumour Detection Using Deep Learning**"** 2021 IEEE