WWW.IJRPR.COM

International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

Talking Healthcare Chatbot Using Deep Learning

Bhavik Chandrakant Badgujar[1], Krushna Sarangdhar Bari [2], Pravin Digamber Patil [3], Abhishek Dhanalal Wadile[4]

Shram Sadhna Bombay Trust's College Of Engineering & Technology, Bambhori Jalgaon ,Maharashtra India Department of Computer Engineering
bhavikbadgujar08@gmail.com, krushnabari8061@gmail.com, pravinpatil44633@gmail.com, abhishekwadile04@gmail.com

ABSTRACT ;-

The reason for creating healthcare chatbots is to improve how patients interact with healthcare and make medical help more accessible and engaging. Traditional healthcare systems sometimes struggle to offer quick and personalized help, which can result in patients not fully understanding their conditions, delays in getting diagnosed, and a shortage of healthcare professionals It aims to power each with immediate access to reliable medical information, symptom analysis,and wellness adviceThe reason for creating healthcare chatbots is to improve how patients interact with healthcare and make medical help more accessible and engaging. Traditional healthcare systems sometimes struggle to offer quick and personalized help, which can result in patients not fully understanding their conditions, delays in getting diagnosed, and a shortage of healthcare professionals It aims to power each with immediate access to reliable medical information, symptom analysis,and wellness advice Keywords : Chatbot, Machine Learning, Natural Language Processing, Disease prediction, Food suggestion, Physical activity suggestion, Health care, Stochastic Gradient Descent

Keyword: Chatbot, Machine Learning, Natural Language Processing, Disease prediction, Physical act Health care, Stochastic Gradient Descent

INTRODUCTION

This project focuses on the development of a machine learning-based system for healthcare of human . This medical chatbot that can diagnose the disease and provide basic details about the disease and medication before consulting a doctor. The chatbots are computer programs that use natural language to interact with users.Our project focuses on providing the users immediate and accurate prediction of the diseases based on their symptoms . Natural language processing:- It is the capacity of a computer to extract meaning from a given text . It is required for mining unstructured data and extracting meaningful insight from text. It can assist

systems interpret and identify natural language, and also evaluate it when the conversation requires a reply. NLP blends computational linguistics with machine learning and deep learning models. NLP powers software applications that translate text between languages, respond to requests and instantaneously analyze enormous amounts of data in real time.

COMPONANT OF NLP

- •**Entities:** The object(s) that is(are) regularly mentioned or referred to in the given text. Examples include people, places, organizations etc.
- •**Relations:** The association between entities present in the text. NLP can detect whether there is an association among different entities and the type of relationship that exists.
- •**Concepts**: Gathering general/basic ideas from the text's body that might not be mentioned clearly in the corpus
- •**Keywords:** NLP is able to recognize the significant keywords in the document. This aids in helping to develop a foundation of words from corpus that are pertinent towards the business value you're looking to accomplish.
- •**Semantic Roles:** The subjects, objects and actions that they affect in the corpus .

III. LITERATURE SURVEY

1. "Daigavane , V.V. and Gaikwad, M.A. Water Quality Monitoring System Based on IOT " India, 2017.
2. "Rahman, M.M., Bapery , C., Hossain, M.J., Hassan, Z., Hossain, G.M.J.I., and Islam, M.M. Internet of Things (IoT) Based Water Quality Monitoring System" Bangladesh, 2020.
3. "Lakshmikhtha , V, Hiriyannagowda , A , Manjunath, A., Patted, A., Basavaiah, J., and Anthony, A.A. IoT based Smart Water Quality Monitoring System" India, 2021.

4. The limitations include setting up an appointment with a doctor, automatic report generation of the user so that it can be forwarded to doctor, a video call with an expert professional. The conclusion states that the intelligent health chatbot can help patients by recognising their symptoms, making a thorough assessment and delivering appropriate therapy for the ailment.

IV. PROBLEM STATEMENT

to create a healthcare chatbot that uses natural language processing (NLP) and deep learning techniques to communicate with users, respond to their medical questions, offer health related information, and carry out duties like prescribing medication and monitoring symptoms. The chatbot should be able to converse with users in a humanlike manner, protect their privacy, and provide accurate and trustworthy responses.

V. ARCHITECTURE OF CHATBOT

In order to react to user inquiries via text, graphics, and voice, a chatbot's design includes a candidate answer generator and response selection. The following is the chatbot's architecture:

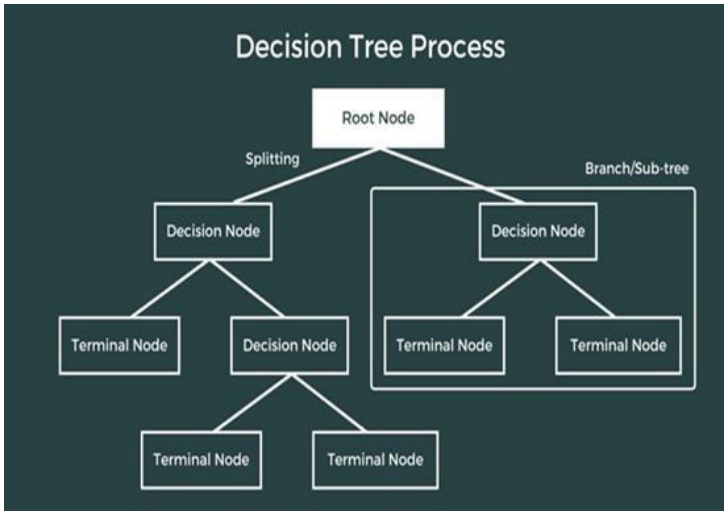


Fig 1. System Architecture

VI. ADVANTAGE OF CHATBOT

This section elucidates the rationale behind choosing the Decision Tree Algorithm for this project, underscoring its superior predictive accuracy and versatility among other evaluated methodologies.

- **Multiple user benefits:** Chatbots function similarly to virtual customer support agents who are always on hand to answer questions. They are able to assist more customers and address more queries.
- **Data gathering and analysis:** Chatbots gather data and produce in-depth evaluations of customer demands and perceptions**.**
- **Cost optimisation:** By doing away with the requirement for a human, a chatbot is a great way to automate customer support and improve agent effectiveness, which will reduce expenses over the medium to long run**.**
- **Assists in managing customer requests:** A chatbot can assist users by generating responses to many consumer queries that are fairly straightforward to react to. 24/7 availability: Chatbots are available at any time without the need of availability of a human

VII. APPLICATION OF CHATBOT

This section introduced the used dataset and the confusion matrix.
E-commerce
Hospitality
Retail industry
Banking and finance
Healthcare
Media and entertainent
Education

VIII. STOCASTIC GRADIENT DESCENT

The best factor configuration for machine learning is found using stochastic gradient descent. It lowers network error by making small adjustments to a machine learning configuration. Once an arbitrary weight vector is selected, it is known as an iterative strategy that is widely used to optimise gradient descent throughout each search.

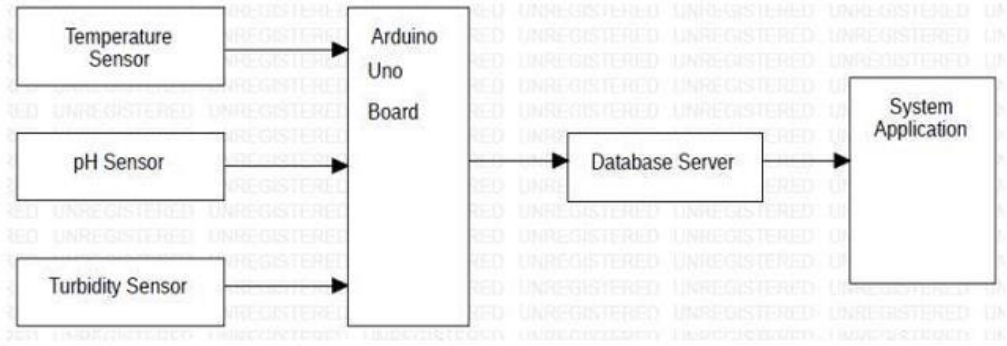


Figure 2.1 System Architecture of Talking Healthcare Chatbot system

IX. Accuracy of model validation and training

Validation is then performed using separate data to assess the model's accuracy and generalization to new instances.
This process ensures that the facial expression recognition system can accurately classify emotions in children with ASD, contributing to improved understanding and support for their social communication skills. Fig 5. shows comparison of validation and training loss and accuracy.

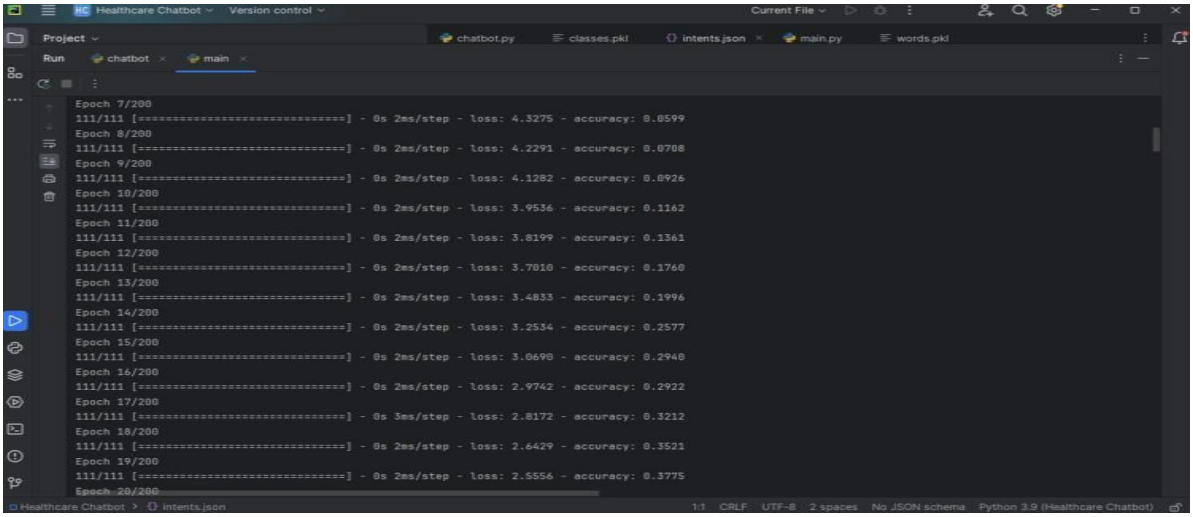


Fig. 5. Accuracy of model validation and training.

X. LIBRARIES USED IN PYTHON

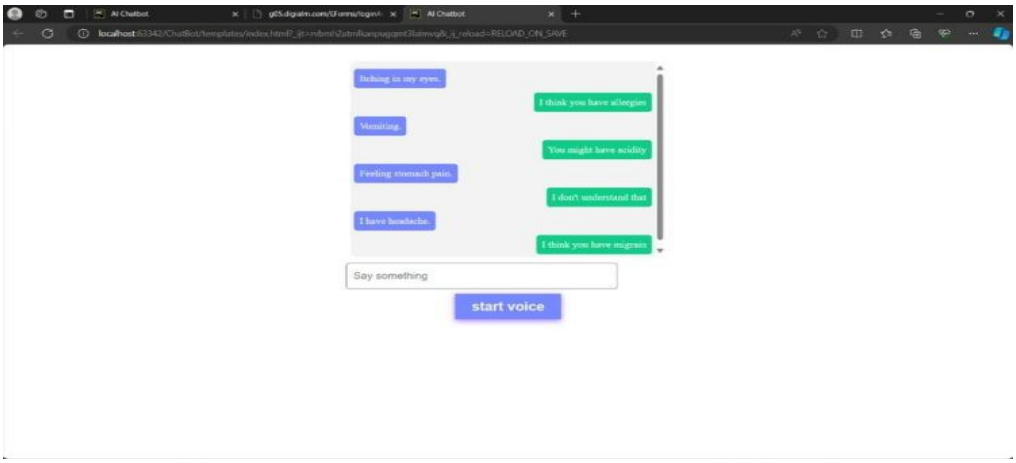
NLTK is a Python library for working with natural language processing (NLP). It offers us access to a large number of evaluation datasets for different text processing packages . It is a Python platform for creating programs that interact with human language information. Text processing packages for tokenization [6], categorization, stemming, tagging, parsing and semantic reasoning are included. **LANCASTER STEMMER** It is a powerful library based on Paice/Husk algorithm which is used to perform stemming of the sentence. By this, the root or stem of the word can be derived. When we employ the NLTK library to construct this method, it allows us to include our unique parameters. **NUMPY** It is used to conduct a broad range of mathematical calculations on arrays. It extends Python with sophisticated data structures as well as a large library of high-level numerical functions that ensure effective computations of matrices and arrays. **RANDOM** The Random module is a built-in Python module that is employed to create randomized integers. This module can be utilized generate random numbers, choose a random value and so on. **JSON** is an acronym that means Java Script Object Notation. It is indeed a textual-based representation of JS object notations, constants, vectors and scalar data. It is frequently used for serializing large datasets and transmitting it across a network. **PICKLE** is generally used in Python to serialize and deserialize Python object structures. It is the method for converting any Python entity to a bytes' stream in order to save it into a document or a database. **SEQUENTIAL** model is ideal for a simple layers' stack with precisely single input and one output tensor **DROPOUT** It is Python's standard Graphical User Interface library. When

paired alongside Tkinter, Python provides a quick and straightforward approach to construct Graphical interface. This layer is a basic stack containing neurons where every neuron takes inputs from across all neurons within preceding layer.

XI. CONCLUSION &FUTURE SCOPE

SoftMax activation function We have implemented a chatbot related to health care that can perform the following tasks.

- The chatbot programme uses natural language processing techniques, such as tokenization, stemming, and bag of words, to process the user's query.
- We have implemented the following machine learning algorithm to increase the Chatbot's efficiency: Stochastic gradient descent, which can recommend food and physical activity to the user and diagnose the ailment based on the symptoms they provide.
- We have achieved fairly good accuracy by comparing our model with other authors' models (Naïve Bayes, Logistic Regression, Random Forest, Multilayer Perceptron). This SGD algorithm system has an accuracy of 84.48%. Given the user's symptoms, it suggests foods and physical activities based on those symptoms.



REFERENCS :

1. Marco Polignano, F. Narducci, Andrea Iovine, Cataldo Musto, Marco De Gemmis, Giovanni Semmeraro , " HealthAssistantBot : A Personal Health Assistant for the Italian Language" in 2020, IEEE based, pp. (99):1-1
2. Nidhi D. Rathi, Dr.A.Deorankar, "An Approach To AI Based Health Care Chatbot System By Using NLP" in 2022, Internal Journal of Creative Research Thoughts (IJCRT), ISSN: 2320-2882
3. Philip Indra Prayitno, Reinhart Perbowo Pujo Leksono, Fernando Chai, Richard Aldy, Widodo Budiharto "Health Chatbot Using Natural Language Processing for Disease Prediction and Treatment" in 2021 1st International Conference on Computer Science and Artificial Intelligence (ICCSAI).
4. Karan Gori, Yasir Ahmed, Shubham Chikane, Amrita Mathur "Medbot: A Chatbot for determining the Probable Diseases based on the User's Symptoms" in 2021 International Research Journal of Modernization in
5. Engineering Technology and Science Vol:03/Issue:05/May-2021 Impact Factor- 5.354 e-ISSN: 2582-5208
6. Rohit Binu Mathew, Sandra Varghese, Sera Elsa Joy, Swanthana Susan Alex "CHATBOT FOR DISEASEPREDICTION AND TREATMENT RECOMMENDATION" in 2019 Third InternationalConference on Trends in Electronics and Informatics IEEE
7. R. V. Belfin, A. J. Shobana, M. Manilal, A. A. Mathew, and B. Babu, "A Graph Based Chatbot for Cancer Patients," in 2019 5th International Conference on Advanced Computing and Communication Systems, ICACCS 2019, 2019, pp. 717 721.