CSCE 5214 -Software development for AI

AI BASED HEALTHCARE CHATBOT

Group_29

Team Members

1. Sai Charan Divi – 11594741
2. Swapna Priya Pala Chitti Babu – 11609223
3. Lakshmi Hima Bindu Meda – 11619641
4. Hari Chandana Eluri – 11660554
5. Chandrika Vasantha – 11608413

Github Link: https://github.com/itachi9604/healthcare-chatbot

Task 1

External Entities

Physicians and Nurses

Doctors and nurses can use the chatbot to access patient records, ask questions about treatment options, and have one-on-one conversations with patients, improving internal communication and care coordination (Choi & Lee, 2021).

Patients

Chatbots in the healthcare industry primarily interact with patients. They ask the chatbot about their health, get doctor recommendations, make appointments, and look up records (Choi & Lee, 2021). The chatbot is an excellent tool for people to have their healthcare questions answered quickly and easily.

Healthcare Databases/EMR Systems

The chatbot might use an integration with EHR systems & healthcare information databases to deliver correct and up-to-date data. By conversing with the user, the chatbot can access and update sensitive medical information such as patient records, prescription histories, and more (Choi & Lee, 2021).

Other Healthcare Apps/Systems (e.g., appointment scheduling)

Chatbots in the healthcare industry may interact with complementary systems like appointment scheduling software. Appointment scheduling and care coordination are improved via this line of communication, leading to happier patients and better healthcare as a whole (Choi & Lee, 2021).

System responsibilities

- **Giving patients medical information and guidance**

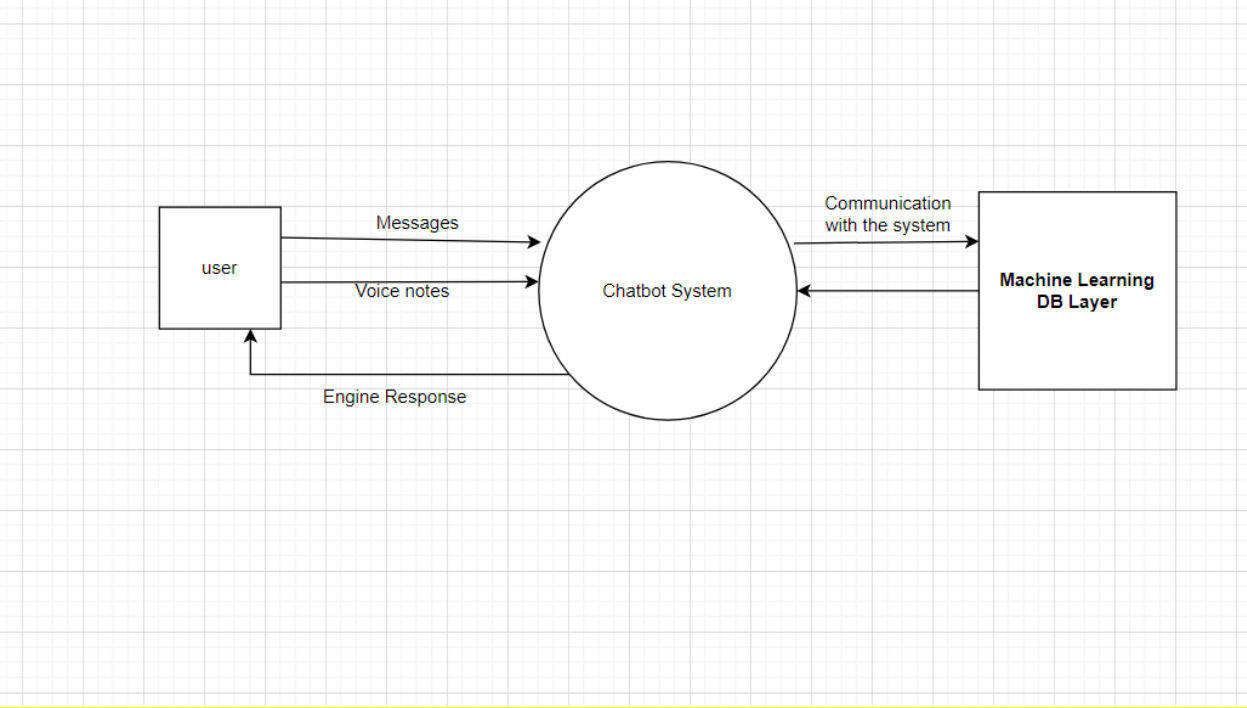
The chatbot should be able to answer basic medical questions and offer information on common medical conditions, medications, and treatments. Home remedies and other tips for dealing with common ailments like colds and allergies should be included (Rong et al., 2020). The chatbot's medical recommendations must be consistent with current medical practice and supported by credible sources.

- **Helping Schedule Appointments**

Patients should be able to schedule appointments with doctors, specialists, and clinics via the chatbot. A check on the availability of the healthcare professional should be made by the chatbot, along with the provision of appointment times (Rong et al., 2020). It is necessary to confirm appointments and communicate with patients to reduce the number of no-shows.

It's important to stress that the chatbot's duties go beyond just dispensing facts. It has a significant impact on boosting healthcare provision, effectiveness, and patient participation. In addition, while dealing with sensitive medical information, the chatbot must put the patient's right to privacy and data protection first (Rong et al., 2020). With artificial intelligence (AI) & natural language processing (NLP), the chatbot can comprehend and appropriately address user inquiries and requests.

Context Diagram



Inputs:

The chatbot will analyze the text of any inquiries posed by users. Some of these are medical complaints, questions about symptoms, and appointment requests (Rong et al., 2020).

Patient Data

"Patient Data" refers to a wide range of information crucial to understanding a patient's healthcare experience. Personal facts like a patient's name and identification number are included here since they are essential for proper identification and documentation in the healthcare system (Matheny et al., 2020). In addition, it incorporates extensive details regarding the patient's medical background and current health state, giving doctors a complete picture from which to draw treatment and care recommendations.

Medication and treatment history information plays a crucial function within this sphere of patient data. This information guarantees that doctors and hospitals have complete records of their patients' medications, dosing, and treatment plans, boosting both patient security and the efficacy of healthcare. The description of symptoms is included in the patient data. Using the chatbot, users can discuss their health problems and concerns with healthcare specialists (Matheny et al., 2020). This symptom data helps make diagnoses and develop individualized treatment plans.

Outputs

The chatbot's various outputs may meet the medical demands of users. Studying the user's inquiries and symptoms can deliver accurate medical advice. Appointment confirmations are sent to users through the chatbot, further improving the user's healthcare experience (Matheny et al., 2020). The chatbot can suggest specialized treatment when deemed required, elevating the standard of care.

The chatbot is a helpful reminder for people needing medication management assistance, facilitating regular pill-taking at the prescribed times. In addition, the chatbot provides connections to valuable healthcare resources, such as publications, websites, and other data sources, so that users may delve more deeply into their health problems (Matheny et al., 2020). Healthcare professionals and administrators may also use the chatbot to ask for information, streamlining the finding and managing relevant data.

Entity Name	Description	Type	Interactions
Patient	End-user of the healthcare chatbot	User	Provides medical queries, personal information
Healthcare Provider	Medical professionals or staff	User	Access patient information, provide medical advice
Pharmacy	External pharmacy services	Service	Receive prescription requests and deliver medications
Electronic Health	Digital health record systems	System	Retrieve and update patient health records

Task 2

Identify System Functionalities

Every chatbot serves essentially the same purpose. Name, contact information, and presenting symptoms are all retrieved. All of this information is stored in a database for admissions, symptom tracking, and general patient records. The chatbot takes notes on relevant keywords after the first interaction. The chatbot will ask more specific questions after a brief scenario and take over (Hsu & Huang, 2020). A disease or illness is requested. After a clear picture is provided, the chatbot may make a definitive diagnosis of the disease. After determining the severity of the patient's condition, it either recommends treatment or contacts a specialist.

User Scenario

chatbot 1:! Please describe the signs in words.

User: My throat hurts.

Chatbot 1: If the reply isn't displayed, text "send" to 800145.

chatbot 2! What is your health status?

User: My throat hurts.

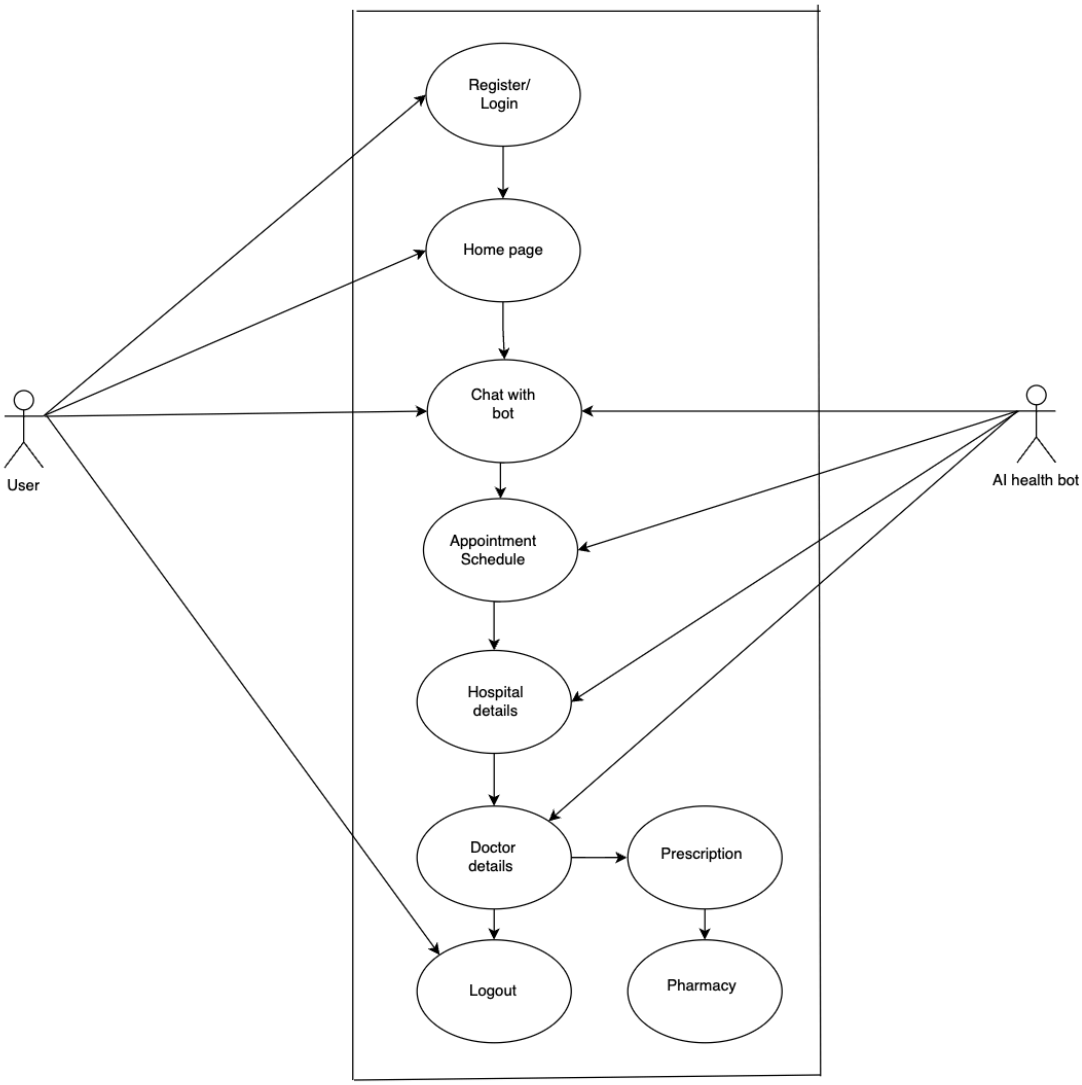
Chatbot 2: Do you have a fever? Chatbot 2?

User: I do

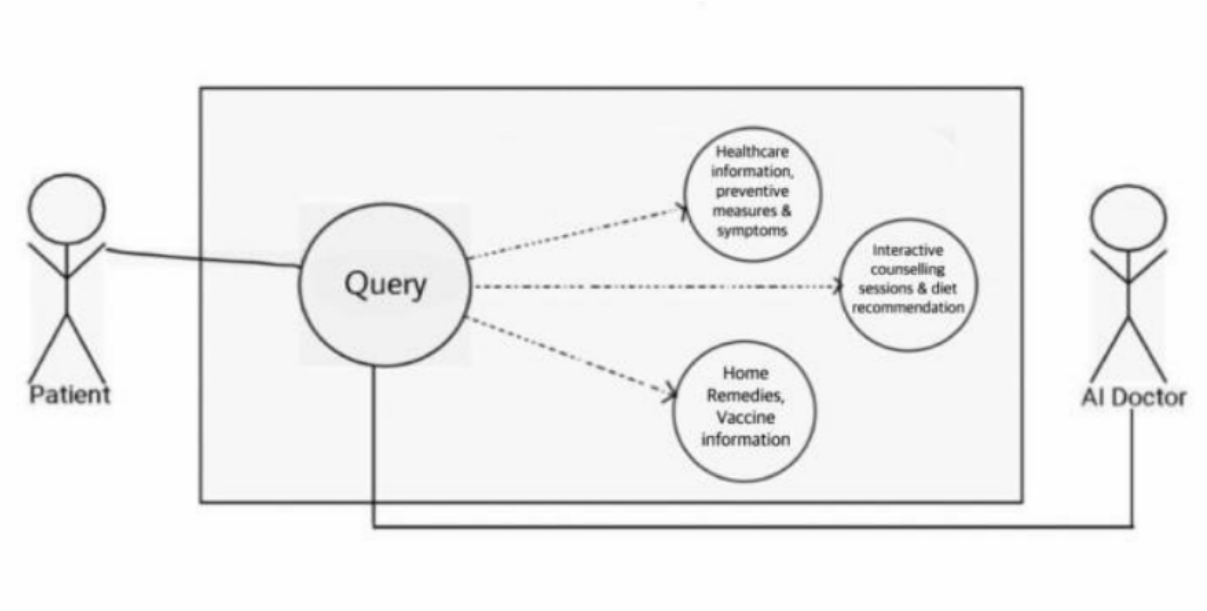
Chatbot 2: Have you spoken with a COVID patient in the last 14 days?

User: I do

Create a UML Use Case Diagram



UML Component Diagram



UML diagram showing the use cases of the Bot

Chat bot: Finder might involve data from the EHR for precise and state-of-the-art supplier postings. The Medicine Data part inquiries the Clinical Information Base to give precise insights concerning meds.

Hospital details: The Medical services Supplier Finder might involve data from the EHR for precise and state-of-the-art supplier postings.

Appointment Scheduler: The Arrangement Planning part guarantees that all booking processes comply with protection and security guidelines.

General Health Information: The Overall Wellbeing Data part might question the Clinical Information Base to give nitty gritty data on unambiguous wellbeing subjects.

Task 3

Report Challenges

Systems built on artificial intelligence need a lot of data to train on pertinent information and provide relevant responses. This is one of the primary problems with AI in healthcare. Contrary to other industries, consolidating healthcare data is challenging. Because patient experiences differ, healthcare data is only sometimes accurate (Hsu & Huang, 2020). Medical institutions and staff members may address the same healthcare problem differently. Getting the best information for AI training is challenging because of the need for more consistency, many variables, and rising complexity.

Share Lessons Learned

Chatbots can revolutionize healthcare with very minimal involvement from humans. Chatbots are powered by artificial intelligence (AI). Text is the primary mode of communication between users and systems. The database is responsible for storing data and retrieving it when required (Hsu & Huang, 2020). These chatbots can provide medications in times of emergency or other uncomfortable conditions

around the clock. They give information that may be relied upon for medical purposes.

References

Choi, J., & Lee, W. S. (2021). Chatbots in Healthcare: A Comprehensive Review. Healthcare Informatics Research, 27(2), 115-126.

Hsu, J., & Huang, J. (2020). Artificial Intelligence and Healthcare. Annual Review of Biomedical Data Science, 3(1), 35-52.

Matheny, M. E., Whicher, D., & Israni, S. T. (2020). Artificial intelligence in health care: a report from the National Academy of Medicine. Jama, 323(6), 509-510.

Rong, G., Mendez, A., Assi, E. B., Zhao, B., & Sawan, M. (2020). Artificial intelligence in healthcare: review and prediction case studies. Engineering, 6(3), 291-301.