S B DEEPAK

**Final Project**

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PROJECT TITLE

"PhysioBot: AI-Powered Chatbot for Personalized Physiotherapy Support"

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# AGENDA

The project's goal seems to be developing a chatbot with a focus on physical therapy. The chatbot makes use of OpenAI's GPT-3 model to produce answers in response to user inquiries concerning conversations, worries, or questions about physiotherapy.   
  
The primary components of the project include:



1) Incorporating the GPT-3 model from OpenAI for natural language processing.

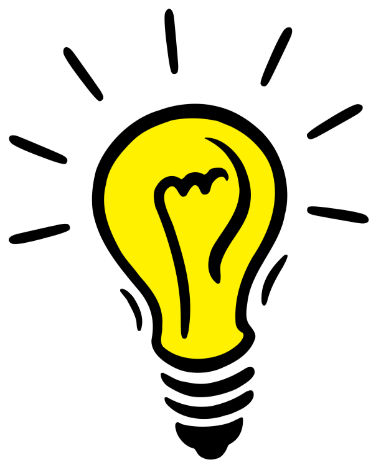
2)The development of a Gradio interface to offer a user-friendly chatbot interface.

3)Using the GPT-3 model, a custom function called CustomChatGPT is done to

process user inputs, produce responses, and show those responses in the Gradio

interface.

PROBLEM STATEMENT



"Develop an AI-powered chatbot specialized in physiotherapy to

deliver individualised support, information, and guidance to users

seeking advice, answers, or discussions connected to physiotherapy

-related queries and problems. The chatbot should harness state-of-

the-art natural language processing capabilities offered by OpenAI's

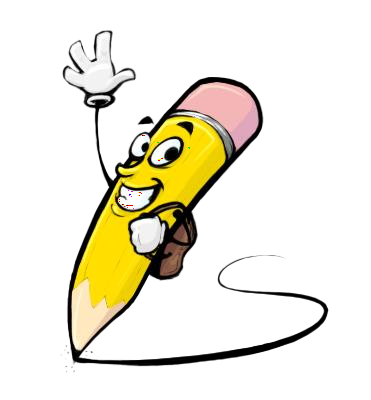
GPT-3 model and should be available through a user-friendly interface.

The objective is to develop a useful and efficient application that

improves patient satisfaction and healthcare outcomes by making

physiotherapy-related information and support more easily accessible."





PROJECT OVERVIEW

Title of Project: Chatbot for AI-Powered Physiotherapy  
  
The project's goal is to create an AI-powered chatbot with

physiotherapy expertise that can offer consumers individualised

support, advice, and information.

Important Elements:  
The chatbot's conversational capabilities can be powered by OpenAI's GPT-3 model, a cutting-edge natural language processing model.

Gradio Interface: Use Gradio to create an intuitive user interface that makes it simple for users to communicate with the chatbot. Create a custom chat function (CustomChatGPT) to process user inputs, send queries to the GPT-3 model, and show the results in the Gradio interface.

Physiotherapy Specialisation: Teach the chatbot to comprehend and react to questions on exercises, recovery methods, handling injuries, and general guidance that are unique to physiotherapy.

**Feedback Mechanism:** To enable ongoing development, provide a feedback mechanism that gathers user input on the efficacy and precision of the chatbot's responses.   
**Security and Privacy:** By putting secure procedures in place, such as storing API keys and abiding by data protection laws, you can guarantee the security of user information and privacy.

**Anticipated Results:   
Enhanced Accessibility:** Make physiotherapy-related information and assistance easily accessible to all users, including patients, carers, and medical professionals.   
**Enhanced Engagement:** By encouraging interaction and engagement, conversational AI raises user happiness and retention.   
**Effective Resource Use:** Help medical professionals by offering precise knowledge and direction, which may in some circumstances eliminate the need for in-person consultations.

**Constant Improvement:** Make use of feedback systems to enhance the chatbot's functionality iteratively, guaranteeing accuracy and relevance over time.

**Future Scope:** The project establishes the framework for upcoming improvements and additions, such as: Integration with systems for electronic health records (EHRs) to facilitate data interchange. Support in multiple languages to serve a wide range of users.   
extension to additional healthcare specialties like speech or occupational therapy.   
The AI-powered physiotherapy chatbot seeks to enhance patient outcomes and healthcare delivery by utilising AI technologies and prioritising user-centric design concepts.



WHO ARE THE END USERS?

The following people might utilise the AI-powered physiotherapy chatbot:  
  
**1. Patients:** People looking for advice, information, or assistance with their physiotherapy requirements. This can include those who are seeking to enhance their physical well-being and mobility, managing chronic conditions, going through rehabilitation, or recovering from injuries.

**2. Carers:** Patients' relatives or other carers helping patients follow their physiotherapy regimens or looking for advice on how to help their loved ones get well or recover may be considered carers.  
  
3. **Healthcare Professionals:** Physicians, nurses, physiotherapists, and other medical professionals who might utilise the chatbot as a resource to get advice, guidelines, or suggestions about certain exercises, treatment modalities, or physiotherapy techniques.

**4. Students and Researchers:** Physiotherapy students and researchers may utilise the chatbot to obtain educational materials, remain current on research findings, or get clarification on ideas and procedures.   
  
**5. Healthcare Organisations:** To improve patient engagement, give patients more help, and make the most use of their resources, hospitals, clinics, rehabilitation centres, and other healthcare institutions may incorporate chatbots into their offerings.  
  
  
The chatbot's overall goal is to assist a wide spectrum of people who are either directly or indirectly impacted by physical therapy, such as patients, carers, medical professionals, students, and organisations in the healthcare industry.

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**YOUR SOLUTION AND ITS VALUE PROPOSITION**

An AI-powered chatbot for physical therapy provides the following main benefits:  
  
**Convenient and Accessible help:** By removing time and location restrictions, the chatbot offers physiotherapy-related information, direction, and help around-the-clock. Whether at home, at work, or while on the go, users can always ask for help when they need it.  
  
**Personalised Assistance:** The chatbot can respond with a personalised message based on the user's unique requirements, preferences, and situation by utilising AI technologies. Because it efficiently addresses each user's unique needs, this personalised approach increases user satisfaction and engagement.  
  
**Effective Use of Resources:** The chatbot provides precise information and direction on physiotherapy procedures, exercises, and treatment methods, making it an invaluable resource for patients and medical professionals alike. This may lessen the requirement for in-person meetings or consultations.

**Constant Learning and Improvement:** The chatbot gains experience from user interactions and keeps getting better over time by using feedback systems and iterative updates. This improves the user experience overall by guaranteeing that the information supplied is correct, current, and relevant.   
  
**Empowerment and Engagement:** By giving users the information, resources, and encouragement they require to manage their diseases, heal from injuries, or enhance their physical well-being and mobility, the chatbot gives users the power to take charge of their physiotherapy journey. Users benefit from this by feeling more engaged and empowered, which improves outcomes and increases adherence to treatment regimens.



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THE WOW IN YOUR SOLUTION

**Natural Language Understanding:** To comprehend and reply to user inquiries in a conversational style, the chatbot makes use of OpenAI's GPT-3 model, one of the most sophisticated natural language processing models out there. Similar to conversing with a human expert, users can engage with the chatbot through natural language.  
  
**Personalised Recommendations:** The chatbot uses advanced algorithms



and machine learning techniques to deliver recommendations and

guidance that are specifically catered to the needs, tastes, and

circumstances of each individual user. The chatbot offers extremely

relevant and customised responses, whether it's suggesting particular

activities, giving advice on injuries, or suggesting rehabilitation schedules.

**Availability and Accessibility**: The chatbot is available 24/7, giving users access to information and help for physiotherapy at any time and from any location. Its round-the-clock accessibility guarantees that consumers can get help and direction anytime they need it.

**Continuous Learning and Improvement:** Over time, the chatbot can adjust and enhance its responses as a result of the input and interactions it receives from users. With every encounter, the chatbot learns from users' feedback and interactions, gaining more experience and ability to provide increasingly precise and beneficial advice.  
  
**Empowering User Experience:** The chatbot gives consumers the tools, resources, and support they need to be actively involved in their own physical therapy journey. When they receive tailored help and advise, users feel empowered and supported, which increases their engagement, adherence, and ultimately produces better results.

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# MODELLING

**Collecting and Preparing Data:**   
  
Locate and compile pertinent data sources, such as medical literature, treatment manuals, physiotherapy-related text corpora, and patient FAQs.  
To prepare the data for entry into the model, preprocess it by cleaning, tokenizing, and formatting. This could entail doing things like standardising text format, addressing missing values, and eliminating noise.   
  
**Model Choice:**   
  
Select an appropriate language model for the chatbot's tasks related to natural language generation and understanding. The GPT-3 model from OpenAI was chosen in this instance because of its superior ability to produce text responses that resemble those of a human. Optimise the pre-trained GPT-3 model with data unique to physiotherapy in order to better align it with the domain and enhance its efficacy on pertinent tasks.

**Instruction and Assessment:**  
To train and evaluate the model, divide the dataset into test, validation, and training sets.  
Using the physiotherapy dataset, train the refined GPT-3 model, adjusting model parameters to reduce loss and increase performance measures like accuracy and coherence. Analyse the trained model's performance in producing pertinent and well-reasoned answers to questions about physiotherapy using the validation and test sets.

**Gradio Interface Integration:**   
  
Create a custom chat function called CustomChatGPT to process user inputs and send queries to the trained GPT-3 model to produce answers. Create a user-friendly platform for communicating with the chatbot by integrating the chat feature with the Gradio UI.   
Incorporate functionalities like text entry fields, buttons, and output displays to enable user engagement and feedback.

**Feedback Loop and Iterative Development:**  
Include a feedback feature in the Gradio interface so that users can provide input on the chatbot's answers. Examine user comments to find areas that need work and adjust the model appropriately. To improve the chatbot's efficacy and performance over time, make iterations to the model training and evaluation procedure.

**Security and Privacy Considerations:**  
  
To safeguard user data and guarantee adherence to data protection laws, put strong privacy and security measures in place. Protect sensitive data and API keys to stop unauthorised access and system abuse. Through the use of this modelling technique, the project seeks to create an AI-powered physiotherapy chatbot that can comprehend user inquiries, produce pertinent responses, and enhance its functionality over time to offer users helpful support and assistance.

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# RESULTS

The comes about of the AI-powered physiotherapy chatbot venture can be assessed over different measurements to evaluate its adequacy, ease of use, and affect. Here are a few key comes about:

1. Exactness and Significance of Reactions:

- Degree the exactness and significance of the chatbot's reactions to client questions by assessing the similitude between created reactions and expert-provided answers or gold-standard reactions.

- Utilize measurements such as BLEU score, ROUGE score, or semantic similitude scores to evaluate the quality of reactions.

2. Client Fulfillment and Engagement:

- Accumulate criticism from clients through overviews, interviews, or client surveys to survey their fulfillment with the chatbot's execution and convenience.

- Degree client engagement measurements such as session length, number of intelligent, and rehash utilization to gage the adequacy of the chatbot in keeping clients locked in.

3. Openness and Accessibility:

- Assess the availability and accessibility of the chatbot by analyzing utilization designs and client engagement over diverse time periods and geographic areas.

- Survey the affect of 24/7 accessibility on client involvement and fulfillment.

4. Personalization and Custom-made Bolster:

- Degree the viability of the chatbot in giving personalized suggestions and custom-made back to clients based on their person needs and inclinations.

- Analyze client input to distinguish regions for change in personalization and customization of reactions.

5. Effectiveness and Asset Utilization:

- Survey the affect of the chatbot on asset utilization inside healthcare offices by following measurements such as diminishment within the number of coordinate interviews, arrangement hold up times, and workload conveyance among healthcare experts.

- Assess the proficiency picks up accomplished through the utilize of the chatbot in giving opportune and precise data to clients.

6. Ceaseless Change and Versatility:

- Screen the execution of the chatbot over time to survey its capacity to adjust to changing client needs, dialect designs, and domain-specific information.

- Degree the viability of iterative overhauls and fine-tuning in improving the chatbot's execution and pertinence.

7. Protection and Security Compliance:

- Guarantee compliance with information security controls and survey the viability of security and security measures actualized to protect client information and secure against unauthorized get to.

Demo Link

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