|  |  |
| --- | --- |
|  |  |
|  | **SCHOOL OF COMPUTING AND INFORMATION TECHNOLOGY** | |

**Bachelor of Technology**

**in**

**COMPUTER SCIENCE AND INFORMATION TECHNOLOGY**

**Mini Project synopsis**

**AI CHATBOT**

By

|  |  |
| --- | --- |
| **PRANAY HARISHCHANDRA** | **R21EJ124** |
| **SUMITH** | **R21EJ145** |
| **YASH AJAY SONONE** | **R21EJ150** |
| **DHRUV AGARWAL** | **R21EM017** |

**Under the supervision of**

**Dr. B. MUTHU KUMAR**

**Professor**

**School of Computing and Information Technology**

Rukmini Knowledge Park, Kattigenahalli,

Yelahanka, Bengaluru-560064

**Rukmini Knowledge Park, Kattigenahalli, Yelahanka, Bengaluru-560064**

[**www.reva.edu.in**](http://www.reva.edu.in)

**April 2024**

**Project Summary**

This project is aimed at creating an AI chatbot to help people suffering from depression, anxiety and other mental disorders. It is made up of layers of artificial neurons creating a neural network which is trainable on different datasets, mental health conversations in our case.

**Verified By:**

Guide Name: Dr. B. Muthu Kumar

Date:

Signature:

**1. Problem Definition**

In the realm of mental health, a significant number of individuals suffer from depression, anxiety, and other mental disorders. Despite the increasing awareness of mental health issues, barriers such as social stigma, lack of access to professional help, and financial constraints still prevent many from seeking the support they need. Current digital solutions, including online counseling and informational websites, offer valuable resources but often lack the immediacy, affordability, and anonymity that could encourage more individuals to take the first step towards seeking help. Moreover, the global nature of mental health challenges, exacerbated by the COVID-19 pandemic, highlights the urgent need for scalable and accessible mental health support tools.

The proposed AI chatbot aims to bridge this gap by providing an immediate, accessible, and non-judgmental first line of support for individuals experiencing mental health challenges. Through the use of conversational AI, the chatbot will offer empathetic responses, evidence-based self-help strategies, and guidance towards professional help if necessary. This solution acknowledges the complexity of mental health issues and the diversity of those affected by them, aiming to reduce the barriers to seeking help and encouraging early intervention. By leveraging AI, the project seeks to complement existing mental health services and provide a supportive space for individuals to explore their feelings and concerns, ultimately contributing to a broader effort to address the mental health crisis.

**2. Objectives**

* Provide immediate,24/7 support to users
* Enhance mental health support accessibility
* Deliver evidence based information
* Promote mental health awareness
* Ensure user safety at all times

**3. Scope of the project**

**Boundaries**: this project can not replace actual psychiatrist’s counselling,

**Scope:**

* Content Delivery: It will deliver evidence-based psychological advice and self-help strategies, tailored to users' inputs regarding their mental state.
* Privacy and Security: Ensuring the confidentiality and security of user interactions, adhering to relevant data protection laws and ethical standards.

**4. Functional Requirements**

Maximum 300 words as multiple paragraphs/numbered list. A Functional Requirement (FR) is a description of the service that the software must offer. It describes a software system or its component. A function is nothing but inputs to the software system, its behaviour, and outputs. It can be a calculation, data manipulation, business process, user interaction, or any other specific functionality which defines what function a system is likely to perform.

User Interaction

* The chatbot must be able to conduct conversations with users in natural language.
* It should understand and respond to user inputs related to mental health issues, such as expressions of anxiety, depression, and distress.

Content Delivery

* The system should provide evidence-based psychological advice, coping strategies, and mental health information tailored to the user's specific queries or emotional state.

Crisis Identification and Response

* Detect user expressions indicative of a crisis or harmful intentions and respond by providing appropriate crisis intervention resources, including hotlines and professional help suggestions.

User Privacy and Data Security

* Must ensure user anonymity and confidentiality, requiring no personally identifiable information unless voluntarily provided by the user for the purpose of receiving more personalized support.
* Implement secure data handling and storage practices to protect user privacy and comply with applicable data protection laws.

Feedback Collection

* Allow users to provide feedback on their interaction experience and the helpfulness of the chatbot's responses.

Professional Referral System

* When necessary, guide users towards professional mental health services, providing information on how to access such services.

**5. Non-Functional Requirements**

Maximum 300 words as multiple paragraphs/numbered list. Non-functional requirements are global constraints on a software system e.g., development costs, operational costs, performance, reliability, maintainability, portability, robustness etc.

1. Scalability
   * The system must be scalable, capable of handling a growing number of users and increasing data volume without degradation in performance.
2. Usability
   * User Interface: The chatbot interface should be intuitive and user-friendly, suitable for users with varying levels of technological proficiency.
   * Accessibility: Adhere to accessibility standards to cater to users with disabilities.
3. Security
   * Implement robust security measures to protect against unauthorized access, data breaches, and ensure compliance with data protection laws like GDPR or HIPAA (if applicable).
4. Maintainability
   * The system should be designed for easy updates and maintenance, allowing for the quick addition of new content, features, and improvements based on user feedback.
5. Ethical Considerations
   * The chatbot must adhere to ethical guidelines, ensuring it provides support in a manner that is respectful, non-judgmental, and culturally sensitive.

**6. Software/System Requirements**

Development Requirements

Software Development Kit (SDK) and Frameworks

* Natural Language Processing (NLP) Tools: Utilize libraries like NLTK, spaCy, or frameworks like Rasa for building conversational AI.
* Machine Learning Libraries: TensorFlow, keras, PyTorch for model development if custom AI solutions are necessary.
* Web Development Frameworks: Flask or Django for backend if a web interface is developed; React or Angular for frontend development.

Integrated Development Environment (IDE)

* PyCharm, Visual Studio Code, or any other IDE that supports Python and web development technologies.

Version Control

* Git, with repositories hosted on platforms like GitHub or GitLab for version control and collaboration.

Deployment Requirements

Server Specifications

* Web Server: Nginx or Apache for managing web traffic if a web-based interface is provided.

Database

* Type: Relational (PostgreSQL, MySQL) or NoSQL (MongoDB, DynamoDB) depending on the data structure and scalability needs.
* Security: Encryption at rest and in transit, with access controls in place.

Security and Compliance

* SSL/TLS encryption for secure data transmission.
* Compliance with GDPR, HIPAA, or other relevant data protection standards, which may dictate specific technical and procedural requirements.

User-End Requirements

Hardware

* No specific hardware requirements for users, but the chatbot should be accessible via standard consumer devices including smartphones, tablets, and computers.

Software

* Web Browser: Latest versions of Chrome, Firefox, Safari, or Edge if the chatbot is web-based.
* Mobile OS: iOS and Android if a mobile application is developed. Compatibility with the latest and penultimate major versions is recommended.

Internet Connection

* An active internet connection with sufficient bandwidth for smooth interaction with the chatbot.