International Journal of Research Publication and Reviews

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

AN AI-POWERED CHATBOT FOR MENTAL HEALTH SUPPORT USING MULTIMODAL INTERATION AND GRAPHIC ATHENTICATION

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ABSTRACT-

This article details the development of an AI-powered chatbot system designed to improve mental health, specifically stress and depression. The proposed system allows users to communicate by speech and text, resulting in an intuitive and natural interface. It interprets user inputs using advanced Natural Language Processing (NLP) techniques and offers personalized mental wellness suggestions, such as mindfulness and yoga classes. To ensure secure user access, an innovative graphical password authentication system is employed. The chatbot system is constructed with Python and MySQL, and it has a web interface. Extensive testing demonstrates that the platform offers outstanding tailored help, preserves user privacy, and enhances accessibility, making it an appropriate tool for current mental health care.

Keywords: Mental health, chatbot, artificial intelligence, graphical password, natural language processing, yoga recommendations.

INTRODUTION

Raising mental health awareness has never been more important in today's technologically advanced culture. With rising levels of stress, anxiety, and depression among individuals of all ages, there is a greater need for accessible, effective, and empathic support networks. This project aims to meet an urgent need by creating an AI-powered chatbot specifically built to help with mental health treatment. The chatbot serves as a virtual friend, engaging users through both text and voice chats, providing a flexible and comforting channel for people to express their emotions and seek direction. This solution stands out for its novel features, which improve both functionality and user experience.The chatbot offers individualized mental wellness recommendations based on user interactions, such as mindfulness techniques and yoga routines, which are accompanied by accompanying graphics to make it easier for users to follow along. Furthermore, the platform includes a unique graphical password authentication method to assure secure and private user access while emphasizing confidentiality and data security. By combining artificial intelligence with secure access protocols and individualized wellness support, this project aims to build a safe, intuitive digital environment that promotes mental well-being and encourages proactive self-care in our increasingly digital world.

RELATED WORKS

Mittal et al. [1] developed a *web-based FAQ chatbot* for hospitals that efficiently answered common patient queries. The system significantly reduced administrative workload by automating frequently asked questions, thereby improving response time and patient satisfaction.Ye et al. [2] designed a *chatbot for follow-up management* of workers, aiming to support occupational health. The study highlighted how chatbot systems could enhance communication and ensure continuity of care post-treatment.Angappan et al. [3] introduced an *AI-based healthcare chatbot* system capable of assisting patients in receiving medical information. Their research focused on natural language processing (NLP) capabilities and user-centered design to enhance the chatbot's effectiveness.Saligrama and Shetty [4] proposed an *AI-enabled chatbot for hospital web applications*. Their work emphasized the real-time handling of patient inquiries and appointment scheduling, offering a seamless user experience on healthcare websites.Jameel et al. [5] conducted a study on a *doctor recommendation chatbot*, which helped patients connect with appropriate medical specialists based on symptoms. This chatbot used structured decision trees and intelligent filtering to enhance accuracy.Sophia et al.[6] surveyed *chatbot implementations using the Natural Language Toolkit (NLTK)* in healthcare. The study reviewed multiple architectures and concluded that rule-based and hybrid models performed best in constrained domains like healthcare.Shaik et al. [7] presented *CovisstanceChatbot*, developed during the COVID-19 pandemic to deliver timely information, assess symptoms, and suggest appropriate actions. It demonstrated the role of chatbots in handling public health emergencies.Jitgosol et al. [8] designed a chatbot for *human resource management* but their architecture and interaction design principles were adaptable to the healthcare domain, especially for internal hospital administrative tasks.Ayanouz [9] proposed a *smart chatbot architecture based on NLP and machine learning* for

healthcare assistance. This architecture leveraged deep learning for improved semantic understanding, enabling more intuitive and human-like interactions.Kolanu [10] developed a chatbot that functioned as both a *diabetic diet suggester and appointment scheduler*. This multi-functional chatbot demonstrated how combining health tracking and AI could provide personalized care plans and improve patient engagement.

EXISTING SYSTEM

Traditional mental health support systems, such as in-person therapy, helplines, and self-help materials, provide tailored care through sympathetic listening, structured guidance, and therapeutic practices. While these strategies are effective, they have substantial drawbacks, such as restricted access in distant locations, long wait times, and the social shame associated with requesting treatment.

When people are experiencing mental or physical suffering but are unsure of the source, they typically turn to the internet. Medical queries, as opposed to targeted web searches, are exploratory in nature, with the goal of understanding symptom patterns, potential illnesses, and treatment alternatives. This conduct emphasizes the necessity for intelligent systems capable of interpreting ambiguous, imperfect information and providing precise, user-friendly instructions.

Given the complexities and sensitivity of such questions, there is an increasing desire for AI-powered technologies that provide accessible, supportive, and context-aware mental health aid.

PROPOSED SYSTEM

The suggested system is an AI-powered platform that aims to give comprehensive help to those dealing with stress and depression while prioritizing user security, accessibility, and ease of use. It is available in both web and mobile applications and allows for seamless text and speech interaction, allowing a wide range of user preferences and fostering inclusivity.

The chatbot uses powerful Natural Language Processing (NLP) to provide contextually aware, sympathetic, and tailored responses. It provides individualized coping skills, mindfulness exercises, and referrals to professional aid as needed. A prominent feature is its extensive library of yoga positions, which includes high-resolution photos and step-by-step instructions to improve both physical and emotional well-being.The platform uses a secure backend with graphical password authentication and robust data processing, while the user-friendly frontend offers easy navigation. To ensure efficacy and relevance, rigorous testing will evaluate functionality, usability, and security, with regular upgrades based on user feedback and technological advancements.

METHODOLOGY

- Interface Creation
- Post Questions
- Keyword Extraction
- Top K Results
- Suggest Yoga details

INTERFACE CREATION

Chatbots are AI-powered computers that communicate with users in natural language. Although each chatbot specializes in a distinct topic, the interaction flow is the same—matching user input with an established knowledge base. Using artificial intelligence, this system aspires to contribute to health informatics by offering affordable and accessible healthcare support. Given the scarcity of chatbots in healthcare, this module creates a framework in which patients can receive rapid responses without requiring human participation. Admins can program the bot with keywords and responses for future usage.

POST QUESTIONS

Users can communicate with the chatbot just as they would with a real person. After registering and logging in, individuals can submit text-based health inquiries. The chatbot asks follow-up questions to help explain symptoms and provide appropriate recommendations.

KEYWORD EXTRACTION

The system processes user inquiries as follows:
  a.Tokenization is the process of breaking down text into individual words or tokens.
  b. Stop Word Removal: Eliminating common words (such as "the," "and," and "of").
  c.Stemming is the process of reducing words to their root forms using algorithms such as Porter's, which aids in the identification of pertinent health issues and yoga suggestions.

TOP-K RESULTS

Extracted keywords are transmitted to the server. If the user requests a diagnosis, the chatbot uses machine learning algorithms to retrieve and display pertinent findings depending on symptoms.

SUGGEST YOGA DETAILS

Based on the user's emotional state and reactions, the chatbot recommends individualized yoga positions and mindfulness techniques. Each tip contains step-by-step instructions and supportive visuals, urging users to practice regular self-care and naturally manage stress or sadness.

PROPOSED ARCHITECTURE

The chatbot architecture consists of the following fundamental components:

a. User Interface: Available on the web and mobile, with text and voice inputs.
b. NLP Engine: Processes user inputs to extract keywords, identify sentiment, and determine intent.

The Recommendation System suggests tailored yoga positions and mindfulness exercises. Graphical Password System: Improves login security using image-based authentication. MySQL's database layer contains user profiles, histories, and interaction logs.

Tokenization, stop-word removal, and stemming (Porter's method) are used to extract keywords. Sentiment analysis and classification help to refine the chatbot's responses.
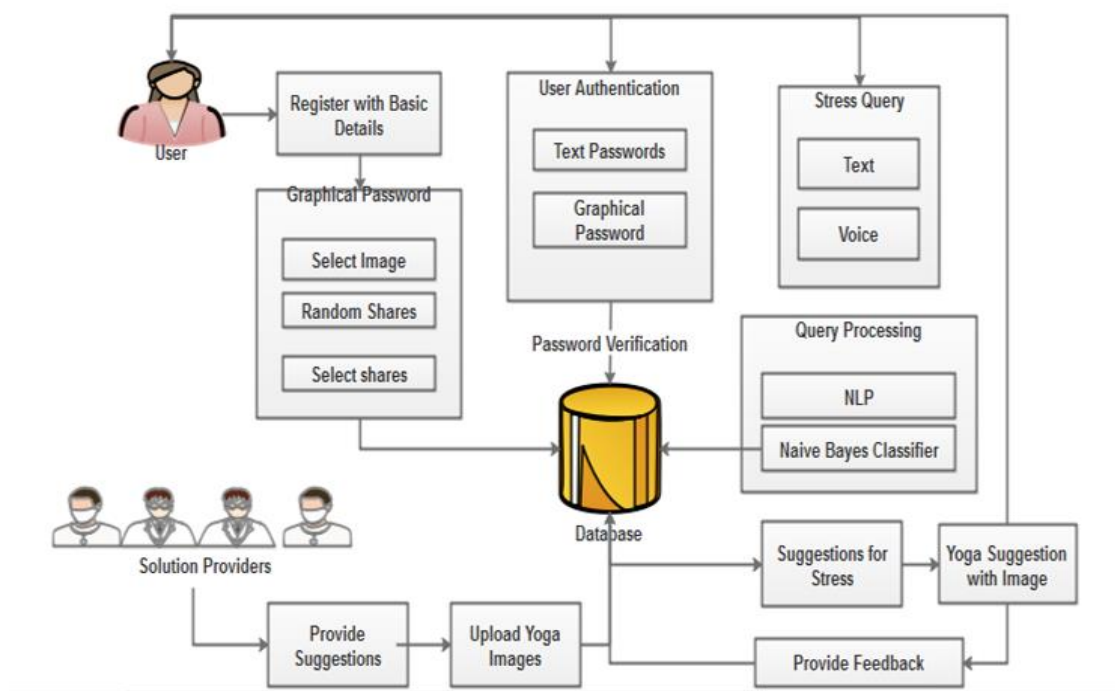

Fig 5.1 Architecture diagram

IMPLEMENTATION

The system was built with Python (v3.7), HTML, CSS, and JavaScript, with MySQL as the backend. The chatbot interface enables real-time, bidirectional communication via AJAX and speech recognition APIs. User registration is protected by a graphical password login page. Once authorized, users can interact with the bot to receive health advice, workouts, and self-care routines.

RESULT AND EVALUTION

The chatbot was evaluated for unit functioning, integration reliability, and security robustness. Basic path and conditional testing proved its logic across a variety of user scenarios. Users loved voice contact, graphical login security, and tailored wellness tips. The system successfully handled various user inputs while remaining responsive.
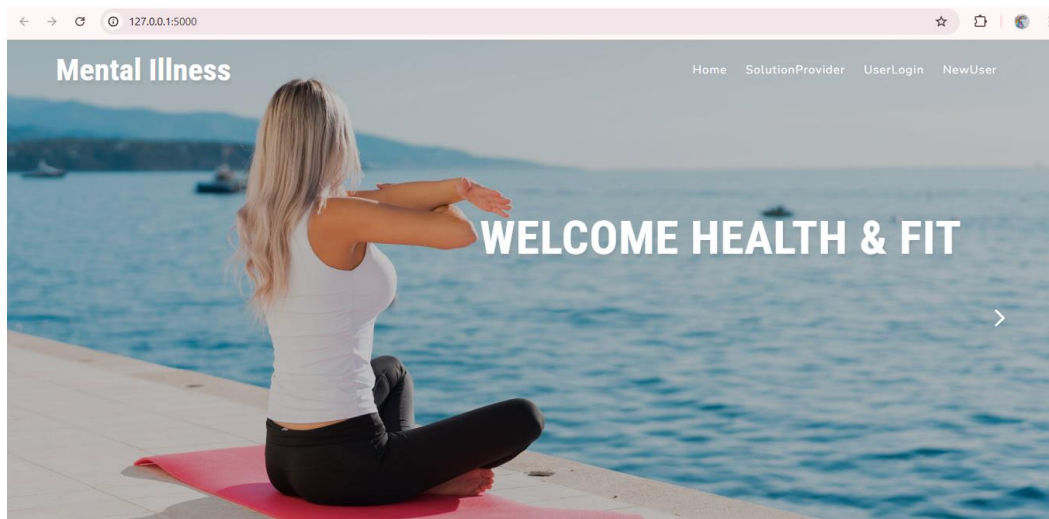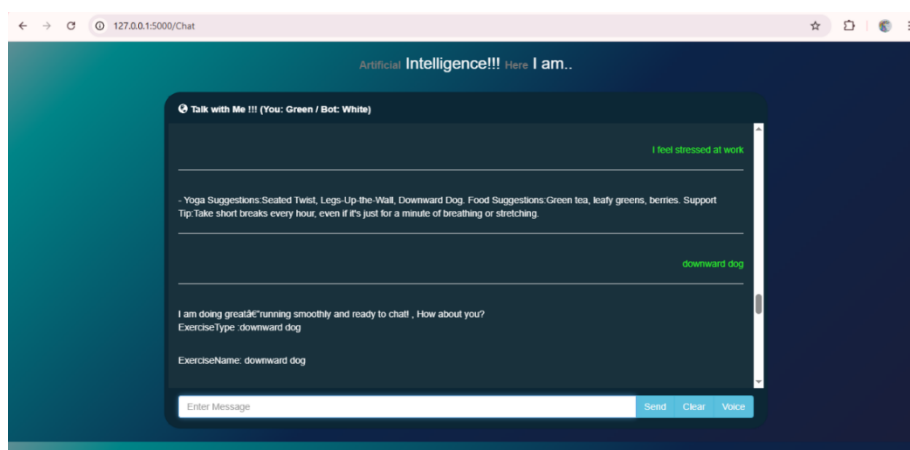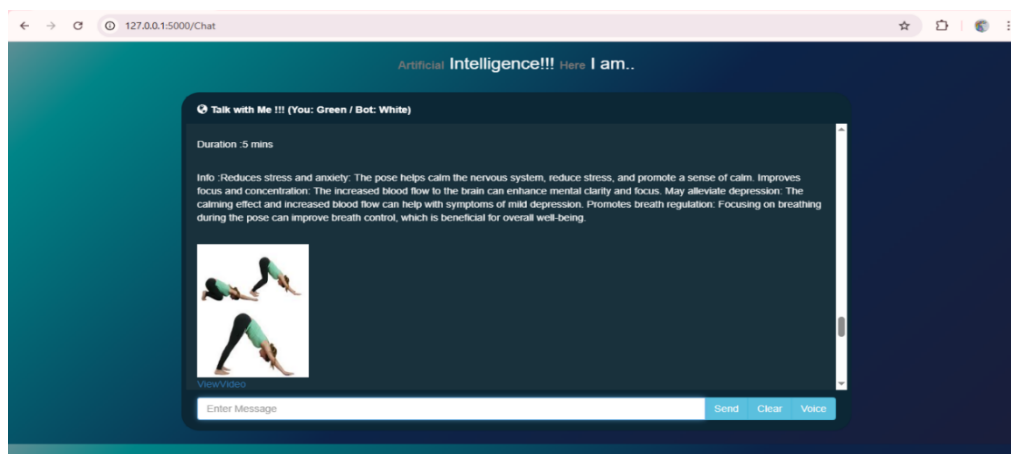

Fig 7.1 Home page

Fig. 7.2 Chatbot

Fig . 7.3 Chatbot suggesting yoga

CONCLUSION

In conclusion, the AI-powered mental health chatbot represents a significant step forward in promoting emotional well-being in today's digital age. It provides a comprehensive and accessible stress and depression management solution by combining intelligent voice and text interactions with personalised mindfulness, yoga guidance, and expert assistance. The integration of secure graphical password authentication protects user privacy and fosters confidence. The system bridges gaps in traditional mental health care and encourages users to take proactive actions toward self-care and emotional resilience, thanks to its user-friendly design, powerful backend infrastructure, and emphasis on ongoing improvement through feedback and testing.

FUTURE ENHANCEMENT

In order to provide even more individualized and precise responses, the system can be extended to include real-time sentiment analysis and mood tracking via facial recognition and biometric inputs like voice tone or heart rate. The chatbot may offer thorough lifestyle-based advice by integrating with activity trackers and wearable health gadgets, which can further enrich user data. Multilingual support can also be added to reach a wider range of users from various cultural and geographic backgrounds. Additionally, the platform may develop to incorporate virtual consultation capabilities, which would allow users to get live support from certified mental health specialists when they need it.Wellness challenges and reward schemes are examples of gamification components that can be used to improve user engagement and long-term adherence to mental health practices. These upcoming updates are intended to turn the chatbot into an intelligent, fully immersive companion for mental wellness that gradually adjusts to the needs of each user.

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