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AI Based Mental Health Consultant for Teenagers

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Abstract

Teenage mental health problems have been increasing, causing the need for easily accessible and efficient support networks. An AI-based mental health consultant created to offer personalised treatment. Through a chatbot with two different modes—Friend Mode, which facilitates sympathetic, casual chats, and Guide Mode, which offers structured guidance—the system provides customized therapeutic responses. To improve accessibility and engagement, the chatbot has text-to-voice and voice-to-text features. A multilingual paradigm also guarantees inclusivity for people from different linguistic origins. The goal of the suggested system is to promote teens' emotional wellbeing by acting as a companion-like mental health assistant.

Keywords: *Chatbot; Multilingual model; Teenage well-being; Voice and text input/output*

1. Introduction

Teen mental health problems are on the rise, with more cases of worry, sadness, and hurt feelings. Even though people are getting more aware, getting help from mental health professionals is still hard due to things like shame, money issues, and lack of resources. This shows that we need a new way to help that is easy to get, private, and works well. Artificial Intelligence (AI) can help a lot with mental health issues by giving hands-on and custom help. This study talks about an AI-driven mental health helper made to act as a friend-like aid for teens in emotional pain. The system uses a chatbot with two key ways to talk: Friend Mode, for casual and caring chats, and Guide Mode, for clear advice. Also, voice-to-text and text-to-voice features make it easy to use, letting users talk with the system in a simple and handy way. The use of a many-language model makes sure it works for people with different language needs.

This setup gives one-on-one help in a private and fun way. It seeks to link pro mental health help with teens who need it. The new plan brings a fresh way to aid mental peace, using AI talks to boost good feelings.

1.1.Objectives

The main goals of this project are

- To create an AI-driven mental health advisor that offers affordable and private help for teenagers going through emotional turmoil.
- To use a chatbot with two modes of interaction:
  1. Friend Mode for casual and empathetic interactions.
  2. Guide Mode for formal and informative advice.
- To include voice-to-text and text-to-voice features to make the user more accessible and interactive.
- To use a multilingual model to cater to users with different linguistic backgrounds.
- To develop an individualized therapeutic experience that responds to users' specific needs and reactions.
- To provide a companion-like interaction that

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reduces stigma and invites teenagers to share thoughts without restraint.

1.2.Literature Review

Machine Learning in ADHD and Depression Mental Health Diagnosis: A Survey [1]

The research investigates machine learning methods applied to detect ADHD and depression by using fMRI, EEG, medical records, video, and audio information. It emphasizes the increasing use of AI in psychiatry diagnosis, especially with remote consultations becoming more popular, and refers to challenges in incorporating AI-based solutions into clinical practice.

1.2.1. Key Learnings

- Machine learning is employed in identifying ADHD and depression from multimodal data.
- Diagnostics powered by AI are more crucial with less access to in-person care.
- Integrating AI into the healthcare system involves technical and ethical issues.

1.2.2. Gaps Identified

- Purposes clinical diagnosis, not AI-driven emotional support.
- Lacks chatbot-driven interventions and multilingual support.
- Does not venture into AI as a companion system for teens.

1.3.A Hybrid Deep Learning Model for Predicting Depression Symptoms from Large-Scale Textual Dataset

This paper proposes a hybrid CNN-LSTM model with a strengthened Two-State LSTM (TS-LSTM) and an attention mechanism to enhance depression detection. The proposed model processes vast textual data collected from an online space where young people freely discuss mental health issues. It attains high predictive accuracy (97.23%) for depression symptoms, indicating the potential of deep learning for early mental health evaluation.

1.3.1. Key Learnings

- CNN and LSTM-based hybrid models enhance depression prediction accuracy.
- The TS-LSTM with the attention mechanism improves feature extraction for mental health analysis.
- Massive text data sets from web platforms are useful in identifying depression symptoms.

1.3.2. Gaps Identified

- Emphasizes detecting depression, not interactive AI-facilitated mental health care.
- Does not possess real-time chat functionality, multi-language capabilities, and voice interaction.
- Mainly employs text-based analysis, without incorporating chatbot-driven interaction.

1.4.Generative AI for Transformative Healthcare: A Comprehensive Study of Emerging Models, Applications, Case Studies, and Limitations

This research discusses the uses of Generative AI (GAI) in the healthcare sector such as medical imaging, drug development, personalized treatment, medical chatbots, and mental health support. It gives examples of real-world applications and talks about large language models specific to healthcare such as Med-PaLM and BioGPT. The research also touches on issues such as data privacy, AI model bias, and seamless integration with the current healthcare system.

1.4.1. Key Learnings

- GAI models such as ChatGPT and DALL-E are revolutionizing healthcare applications.
- Medical chatbots and mental health support systems are becoming emerging areas.
- Challenges involve data protection, AI bias, and decision-making limitations in healthcare AI.

1.4.2. Gaps Identified

- Short on focus on interactive AI-powered mental health companions.
- Does not highlight multimodal support like voice-based communication.
- More research is needed on GAI's role in personalized mental health interventions.

1.5.Enhancing Mental Health with Artificial Intelligence

This research explores the existing trends, ethical issues, and future directions of AI in mental health care. It emphasizes AI uses in early disorder identification, tailored treatment, and AI-based virtual therapists. The study also addresses privacy, bias, regulatory, and human aspects in therapy

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challenges.

1.5.1. Key Learnings

- AI enhances early detection and facilitates personalized mental health care.
- Virtual AI therapists are increasingly becoming popular in mental care.
- Ethical issues, including privacy threats and model validation, need to be carefully addressed.

1.5.2. Gaps Identified

- Lacks how multimodal AI brings together text, voice, and emotional feedback.
- Does not cover real-time AI-facilitated mental health companionship.
- Further research is required on regulatory guidelines for AI-driven mental health applications.

1.6. Providing Self-Led Mental Health Support Through an Artificial Intelligence–Powered Chat Bot (Leora) to Meet the Demand of Mental Health Care

This research investigates Leora, a chatbot that uses artificial intelligence to offer self-directed mental health assistance. It assesses the performance of the chatbot in managing increasing mental health care needs and determines its place in providing affordable, scalable, and easy-to-use assistance. The study also identifies the advantages and disadvantages of AI chatbots in mental health care.

1.6.1. Key Learnings

- AI chatbots can fill mental health care gaps in accessibility.
- Self-directed AI therapy provides a cost-efficient and scalable solution.
- Ethical issues, user interaction, and limitations of chatbots require more research.

1.6.2. Gaps Identified

- Does not have emphasis on multimodal interaction (voice, text, and affect) for enhanced engagement.
- Does not investigate long-term mental health consequences of chatbot interventions.

2. Method

The creation of the AI mental health consultant is a systematic, multi-stage process that integrates artificial intelligence, voice interaction, and multilingual capabilities to provide a smooth and compassionate user experience.

2.1. Data Preprocessing & Collection

Curated a dataset from reliable mental health sources, such as psychological research, therapy conversations, and everyday conversations.

- Implemented data cleaning and preprocessing methods like the elimination of emoticons, slang, repeat words, and unused content to improve the understanding of the chatbot.
- Guaranteed that the dataset has a natural and contextually meaningful flow for significant interactions.

2.2. Chatbot Development

- Deployed a dual-mode AI chatbot with separate functionalities:
  1. **Friend Mode:** Intended for friendly and comforting conversations. The chatbot interacts with empathetic and friendly dialogue, employing informal and friendly language. It offers the option for users to freely express their thoughts without judgment, providing an open environment for free discussion.
  2. **Guide Mode:** Offers organized suggestions in accordance with mental health guidelines. It presents straightforward, informative, and well-researched answers in a more formal tone. Users are provided with actionable recommendations on self-care, coping mechanisms, and mental health.
- Built-in Gemini API for natural and human-like conversations to ensure seamless conversations. [2-5]

2.3. Speech & Sentiment Analysis

- Integrated speech-to-text (STT) and text-to-speech (TTS) APIs, allowing for voice conversations on behalf of users who prefer talking verbally as opposed to typing.
- Developed affective AI to capture emotional signals and make responses more empathetic and contextual.

2.4. Adaptive Responses & Personalization

- Used context-sensitive AI to preserve conversation context and offer relevant,

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personalized feedback.

- Built dynamic response generation to learn varying moods, emotions, and conversation styles. [6-9]
- Added customized mental health recommendations based on user interaction and past conversations.

2.5.Multilingual Support & Accessibility

- Deployed multilingual support to allow users to communicate in their own language, promoting accessibility.
- Designed an accessible and user-focused interface, with ease of use across devices and demographics.

2.6.Safety & Ethical Considerations

- Protected user privacy and ensured data security with robust encryption and anonymization methods.
- Integrated crisis detection tools to identify indicators of extreme distress and lead users to related professional resources.
- Operated an ethical AI system, with responses being non-judgmental, inclusive, and supportive.

2.7.User Testing & Continuous Improvement

- Completed several rounds of testing with actual users, collecting feedback for iterative enhancement.
- Applied A/B testing and performance metrics (accuracy, response relevance, user satisfaction) to optimize chatbot performance.
- Updated the system periodically with new mental health knowledge and developments in conversational AI to maximize effectiveness.

3. Key Features

- **Dual-Mode Chatbot:**
  1. **Friend Mode** – Has light, empathetic chats to offer emotional support.
  2. **Guide Mode** – Provides guided instructions with a more informative and professional tone.
- **Voice Interaction**: Offers text-to-speech and speech-to-text, enabling customers to interact in their choice of way.
- **Multilingual Support**: Allows adolescents to communicate in their language of choice, which opens up mental healthcare services.
- **Personalized Responses**: Uses AI to adjust dialogues according to user feedback to make them personalized and relevant.
- **Safe & Confidential Space**: Offers privacy and judgment-free space where teens can express themselves freely and openly, Figure 1 shows System Flow Diagram, Figure 2 shows System Architecture Diagram

4. System Diagrams

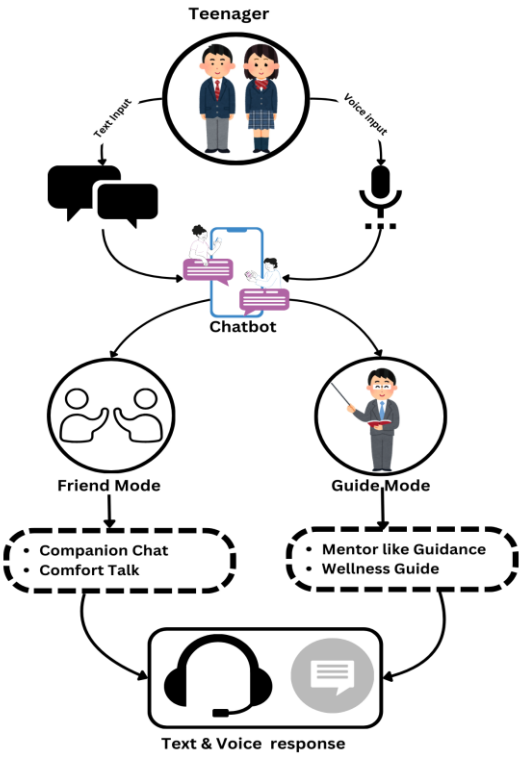

Figure 1 System Flow Diagram

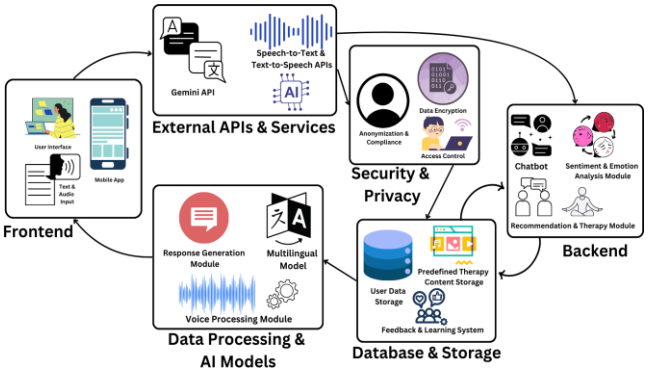

Figure 2 System Architecture Diagram

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5. Results

The AI mental health therapist was tested on different parameters, including chatbot response accuracy, sentiment analysis performance, multilingual model performance, and system performance.

5.1.Chatbot Response Accuracy

- Friend Mode users provided feedback that the responses from the chatbot sounded natural and empathetic.
- In Guide Mode, the chatbot successfully provided formatted guidance from pre-defined datasets.

5.2.Multilingual Model Performance

- The chatbot properly processed and responded in multiple languages, maintaining coherence and context.
- Hindrances faced during translating vibrant emotional sentences.

5.3.Processing Time & Efficiency

- The chatbot answered in text forms with very short latency and slightly longer in voice interactions to fulfill.

5.4.User Feedback & Engagement

- The users have indicated that they felt at ease giving their own views to the chatbot.

Conclusion

The mental health counselor powered by AI provides a safe and empathetic space for adolescents to speak out and share their feelings without judgment. With the integration of conversational AI, voice input, and multilingual support, the system can provide a personalized empathetic experience and guide users through their mental health process. Its two-mode chatbot—Friend Mode for relaxed emotional support and Guide Mode for guided support—allows the platform to be flexible based on user needs. As technology advances, this platform can reshape mental health care in the future to become more accessible, engaging, and successful. Future developments such as real-time emotion recognition, wearable device integration, and immersive therapy modes will take it further. With a focus on ethical AI, inclusivity, and user health, this platform lays the groundwork for a more connected and mentally robust future. multilingual capabilities to provide a smooth.

Future Work

- **Advance Real-Time Emotion Detection:** enhance voice and facial recognition for real-time, more precise emotional analysis.
- **Wearable Device Synchronization:** Synchronize with smart wearables to track physiological markers such as heart rate and sleep, providing deeper mental health analytics.
- **Advanced Personalization:** Create more adaptive interactions that dynamically change based on user behavior, mood patterns, and previous conversations.
- **Global Accessibility & Multilingual Support:** Extend language models to embrace more regional dialects, maintaining inclusivity of diverse user segments.
- **Ethical AI & Bias Reduction:** Augment fairness processes to remove prejudice and maintain humane AI-facilitated mental health care.
- **Immersive Therapy with VR & AR:** Implement interactive therapeutic environments through Virtual Reality (VR) and Augmented Reality (AR) to facilitate guided meditation, relaxation, and coping.
- **Offline Accessibility:** Make core chatbot features available offline so that mental health assistance remains accessible even in regions with poor connectivity.

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