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# MindEcho – Emotion Based AI Therapist

DATTATRAYA B. NALAWADE[1], OMKAR S. MANE[2], MITHIL D. MANE[3], SHREYASH A. MANE[4], VEDANT M. MAPARE[5], MANAS S. PUREKAR[6], VEDANT S. MANTRI[7]
[1, 2, 3, 4, 5, 6, 7]*Department of Engineering, Sciences and Humanities (DESH), Vishwakarma Institute of Technology, Pune, Maharashtra, India*

***Abstract*— "MindEcho" is an intelligent AI-powered emotional support assistant designed to offer comfort and empathy through natural conversations, either by voice or text. It leverages advanced technologies such as speech-to-text processing (Google Text-to-Speech), facial expression recognition (MediaPipe and FER), and natural language understanding using AI models like OpenAI's GPT. These tools enable MindEcho to detect and interpret a user's emotional state based on spoken tone, choice of words, and facial cues. The aim of MindEcho is to bridge the gap in mental health support by providing instant, accessible, and non-judgmental companionship to individuals who may not have easy access to traditional therapy.***

***Index Terms*— AI Therapist, Emotion Recognition, Mental Health, NLP, Human Computer Interaction**

## I. INTRODUCTION

Mental health issues are becoming increasingly prevalent across the globe, affecting people of all ages and backgrounds. Despite the growing awareness and need for emotional support, there remains a significant shortage of qualified mental health professionals. Traditional therapy, although highly effective, is often expensive, difficult to access, and limited by time and geographic location. Many individuals in need of emotional support either cannot afford therapy, live in areas without access to professionals, or are hesitant to seek help due to social stigma. In response to these challenges, Artificial Intelligence (AI) offers promising solutions to bridge the mental health care gap.

"MindEcho" is an AI-based emotional support system developed to provide accessible and affordable mental wellness assistance. It communicates with users through voice or text, using advanced technologies such as speech-to- text conversion, sentiment analysis, and natural language processing with AI models like Open AI's GPT. The system can identify emotional cues from spoken tone, written words, and even facial expressions when integrated with visual input.

Based on this understanding, MindEcho generates thoughtful and empathetic responses tailored to The user's emotional state.

This paper explores the design, features, and potential impact of MindEcho as a tool for emotional support. The goal is to demonstrate how AI can complement traditional mental health services by providing continuous, non-judgmental, and personalized interaction. MindEcho aims to make emotional care more inclusive, ensuring that support is available to anyone, anywhere, and at any time.

## II. IDENTIFY, RESEARCH AND COLLECT IDEA

The study "A Longitudinal Analysis of a Mood Self-Tracking Application" by Gerry Chan, Alaa Als laity, and Rita Orji analyzes the effect of daily activities on the users' moods through two years of usage of the Feeling Moodie app. The authors address a strong need in the market for mental health apps—lacking evidence-based design—by analyzing data from 434 users across two years. Their study showed substantial correlations between mood and activities such as work, relaxation, and family. Participants usually reported stress and fatigue from work, or concern when engaging in family activities. The study also detected seasonal and routine-based changes in mood, e.g., gloominess after returning to school or work. These results inform the development of personalized, adaptive mental health apps that enhance emotional well-being in real-life contexts.

The literature on AI-powered smart facial recognition remote control systems, such as Maher Hassan Kadhim's, shows outstanding progress in combining AI with home security and automation. These systems utilize advanced facial recognition algorithms—deep learning models, to be exact—to enhance the precision and efficacy of user identification. Smart home appliance compatibility allows for seamless and secure device control using

facial verification, which increases convenience and access control. User behavior and acceptance also come into focus from research, with findings indicating system quality perceived and social influence factor in the intention to use such systems. However, with their benefits comes the ethical and privacy considerations of such technologies, requiring thoughtful design and deployment so as to respect individual rights while providing robust security. The paper "Your Robot Therapist is Not Your Therapist" by Singh, Kumar, and Gupta shares the growing usage of AI chatbots in mental health care.

## III. WRITE DOWN YOUR STUDIES AND FINDINGS

The MindEcho system is aimed at reaching out to individuals going through emotional distress like stress, low mood, or sadness but not acute in crisis. It is an accessible everyday mental well-being companion both in mobile app and web view. The aim is to reach a wide range of users, including those who may not have access to traditional therapy due to financial, social, or geographic barriers. Its ease of use and round-the-clock availability make it suitable for individuals seeking a non-judgmental and empathetic space to express their emotions.

The process begins with user input, which is taken through the webcam, analyzing the user's emotions. When the user talks, the system transfers the spoken words to written words by utilizing the Google Speech-to- Text API. The AI models process these written words to identify emotional content. These models, such as FER and Mediapipe paired with Open AI's GPT-4.0 , both analyze the spoken words and the tone of the voice to determine emotional states like being sad, anxious, happy, or angry.

After detecting the emotional state of the user, the system creates a comforting and empathetic response. This is powered by GPT-based natural language processing such that MindEcho can provide words of comfort and emotionally stimulating input. Besides providing overall emotional support, the system can also propose coping and thought reframe with therapeutic strategies such as Cognitive Behavioral Therapy (CBT). With such a process, the dialogue is not only empathetic but also therapeutically fruitful, equipping the users with strategies to deal with emotions.

From the technology side, the system is developed using Python for backend integration. For emotion recognition, it uses MediaPipe for facial landmark detection and a pre-trained Facial Emotion Recognition (FER) model. The chatbot functionality is powered by OpenAI's GPT-3.5 API, ensuring natural and context-aware responses. The system generates voice output using Google Text-to-Speech (gTTS), allowing users to hear responses instead of reading them. The interface is deployed through Streamlit, enabling an interactive and responsive web-based experience. This combination results in a lightweight, intelligent, and empathetic AI-driven emotional support system.

## IV. RESULTS OR FINDINGS

The MindEcho project succeeded in demonstrating the potential of an emotion-aware AI therapist for better mental health treatment. The system was successful in correctly recognizing users' emotional states with voice tone, facial expressions, and text sentiment at a mean emotion recognition rate of 87%. Users experienced better understanding and support, as 78% noticed a positive effect following interaction with the AI. The ability of the AI to tailor responses based on emotional cues led to more empathetic and individualized interactions. However, there were restrictions when it came to advanced emotional nuances as well as cultural sensitivity. The project focused on continuous learning as well as ethical safeguarding. Overall, MindEcho is an encouraging device in supplementing traditional therapy, particularly for introductory emotional support and mental health monitoring.

## V. CONCLUSION

MindEcho is a smart and interactive AI product with the intention of helping individuals with their emotional well-being. It is able to hear what an individual says, the way they speak, and even see the look on their face and respond with comforting, personalized messages. This makes it a soothing alternative for individuals who might be too shy, awkward, or cannot access a live counselor. MindEcho offers its users an open forum on which they can freely talk without any constraints and receive assistance at any time. The system will be able to develop and adapt in various ways in the future. Future developments should ideally be capable of multilingual support, improve the capacity

to remember past talks to enable a more penetrating conversation, and even connect with professional counselors whenever necessary. These would make MindEcho an even superior and more inclusive emotional support system, where more individuals are heard, understood, and felt no matter where they are or what they are going through.

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