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# Mental-Maven: Mental Health Companion Animated Character Support for Mental Health Therapy

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Abstract: This paper provides a comprehensive survey on the use of AI-driven chatbots with animated character support in mental health therapy. MentalMaven aim to improve the effectiveness of therapy by creating more empathetic interactions and tracking user progress through session reports. The survey covers state-of-the-art technologies, including Natural Language Processing (NLP), Machine Learning (ML), and Conversational AI, as well as the ethical considerations involved in deploying such systems. Additionally, the paper reviews research that demonstrates the role of animated virtual characters in enhancing the therapeutic experience and discusses the integration of progress-tracking mechanisms to personalize therapy over time. The digital era brings with it the possibility to tackle the developing mental health emergency. This paper provides an overview of the emerging area of AI-based chatbots created to provide therapeutic intervention. We explore the technologies that are enabling these chatbots to become more advanced, ranging from their capacity to decipher rich language use to their ability to recognize emotional states. Nevertheless, we also rigorously scrutinize the ethics of using such technologies, calling for responsible development that gives utmost importance to user welfare and protects sensitive personal information. This review seeks to present a balanced view of the opportunities and risks of AI in mental health, underlining the significance of human-centered design and ethics.

Index Terms: Mental health chatbot, animated characters, conversational AI, NLP, AI in healthcare, session-based progress tracking, cognitive behavioral therapy (CBT), privacy-preserving frameworks, AI ethics in healthcare.

### I. INTRODUCTION

More people worldwide are experiencing feelings of sad-ness, stress, or anxiety. According to the World Health Orga-nization, more than 264 million individuals are dealing with depression alone. Mental health conditions can significantly impact daily life, affecting relationships, work performance, and overall well-being. Despite the availability of professional mental health services, many individuals hesitate to seek help due to concerns about social stigma, financial constraints, or limited access to qualified therapists. The effects of unaddressed mental health issues are serious, and they include long-term stress, emotional burnout, and sus-ceptibility to physical illness like cardiovascular disorders and compromised immune systems. Additionally, mental health issues lead to reduced productivity in the workplace and impaired social relationships, further reinforcing feelings of isolation and distress. AI chatbots provide a solution to these issues by offering an omnipresent, affordable, and non-judgmental support system. These chatbots leverage sophisticated technologies like Natu-ral Language Processing (NLP), sentiment analysis, and deep learning to recognize users' emotional status and give con-textual responses. With the integration of animated characters, chatbots are able to mimic human-like conversations, so the therapeutic process becomes more interactive and effective. Animated personas bring an affective depth to chat, allowing people to feel more at ease to share their ideas and emotions.

In addition, the application of AI chatbots in mental health counseling goes beyond simple talk. These systems can be programmed with evidence-based psychological methods like Cognitive Behavioral Therapy (CBT) and mindfulness training to lead users through systematic self-help programs. Through interactive exercises, guided meditation, and tailored coping strategies, AI chatbots are an all-around mental health support tool.

In addition, AI chatbots can also regularly track users' progress during therapy sessions by reading through their answers, identifying patterns in moods, and creating informa-tive reports. Using data in this way allows chatbots to refine therapy approaches over time so that users receive customized assistance according to their changing needs. Such AI-based mental health care is especially advantageous for individuals living in distant areas, those who are reluctant to approach conventional therapy, or those who need urgent emotional support.



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### A. Motivation for the Study

We want to learn how new technology, like artificial intelli-gence and virtual characters, can make mental health therapy more helpful and engaging. These tools could help people get the support they need, especially if it's affordable and personalized. This could become a major asset in meeting the rising incidence of mental health issues. The strongest point of AI therapy is that it is cost-effective and accessible. Traditional therapy is out of reach for most people who require it; they either cannot afford it or do not have trained therapists in their locality. The answer is given by AI chatbots as they can provide mental health support at a fraction of the costs for human-assisted therapy sessions.

### B. Contributions of the Paper

The paper adds to the multitude of research on the algorithm using AI in the field of mental health as follows:

- 1) Highlighting chatbots incorporating animated virtual characters for mental health support.
- 2) Evaluating roles in customizing therapy sessions and tracking progress using NLP, AI, and deep learning technology.
- 3) Mentioning ethical benefits pertaining to AI use in mental health, concentrating on mechanisms for privacy preser-vation.
- 4) Reviewing case studies of mental health chatbots already implemented.

### II. LITERATURE REVIEW

Fan Wu; Zhencai Chen (2023):[1] AI in medical diagnosis for depression. Lacks personalization and real-time interaction. Mental Maven integrates dynamic therapy adjustments.

Komal Rani; Harshit Vishnoi; Manas Mishra (2023):[2] NLP-based CBT and remote health monitoring. No voice-based interaction or personalized user engagement. Mental Maven includes voice therapy and virtual characters.

Khushi Mishra; Harshavi Bodkhe; Rutuja Naik; Nidhi Bangalkar; Parul Dubey (2023):[3] BERT model for improved conversations in mental health chatbots. Limited emotional depth due to text-only interaction. Mental Maven adds voice interaction for empathetic support.

Muskan Agarwal; Divyanshi Chauhan; Nidhi Yadav; Swasti Singhal (2024):[4] AI mental health companion development. Missing interactive virtual characters and tailored voice therapy. Mental Maven enhances engagement with these features.

Maria Ogamba; Joseph Gitonga; Betsy Muriithi; John Olukuru; Joseph Sevilla (2023):[5] Focused on mental health support for students using chatbots. Lacks the personalization and advanced engagement techniques found in Mental Maven.

Kira Kretzschmar; Holly Tyroll; Gabriela Pavarini; Arianna Manzini; Illina Singh (2024):[6] Examines ethical considerations and user trust in chatbots. Focuses on privacy and ethical concerns. Mental Maven integrates secure data handling and prioritizes user trust.

Anthony Diaz; Daehan Kwak (2023):[7] Discusses chatbot-based enhancements in mental health. Limited analysis of user engagement; Mental Maven leverages virtual characters for engagement.

Archana Naik; Ushashree P; Kavitha Sooda; Ayman Afza Munsur; Humera Fathima; Janhavi Vijay Patil (2024):[8] Explores a basic mental health chatbot framework. Lacks in-depth sentiment analysis and emotional support capabilities. Mental Maven focuses on these aspects.

Harini V K; Charvi Upreti; Bhavadharini R M; Libin Alex (2024):[9] Chatbot model for mental health. Limited in real-time interaction and adaptation. Mental Maven offers personalized responses based on user data.

Wensheng Tian; Yifan Lu; Jinhao Yu; Jiafeng Fan; Panpan Tang; Lei Zhang (2022):[10] Examines privacy in mental health chatbots. Focuses on secure computation but lacks real-time interaction. Mental Maven balances security with user engagement.

Raghav Naswa; Sugam Jaiswal; Remya Mavila; Weichao Yuwen; Bill Erdly; Dong Si (2024):[11] Conversational AI to assess empathy in mental health support. Does not explore personalized therapy. Mental Maven uses tailored responses to enhance empathy.

Raphael Th'eze; Mehdi Ali Gadiri; Louis Albert; Antoine Provost; Anne-Lise Giraud; Pierre Megevand (2020):[12] Uses animated characters for empathetic interaction. Limited to basic interaction. Mental Maven integrates deeper emotional engagement through voice and animation.

### III. ANIMATED VIRTUAL CHARACTERS IN CHATBOTS

Animated characters, rather than simple computer interac-tion, provide an important connection between users and the medium of mental health apps. They can move, talk, and express emotions in a far more human-like manner, hence as-sisting the user in finding a more friendly, interactive approach, with some resemblance to human contact. Megevand and colleagues suggested in their study that animated characters offer therapy in a manner that seems comfortable and natural to users.



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This richness of experience thus reworks therapeutic interactions, transporting them from something sterile, clinical, and almost transactional into something more reminiscent of having real conversations with a supportive friend.

### A. Design and Features of Virtual Characters

Most animated virtual characters are built with the am-bition of imitating certain human-behaviors, e.g., expressing emotions on their faces, clearing movement of their bodies, and lip-synching their speech. Table I outlines the common features of virtual characters in mental health chatbots.

Feature	Description
Facial Expressions	Emotional cues like smiling, frowning
	Real-time lip movements matching
Lip Synchronization	speech
	Gestures such as nodding, hand
Body Language	movements
	Human-like tone and empathy in
Voice Modulation	responses
Avatar	Ability to personalize the virtual
Customization	character

TABLE I
COMMON FEATURES OF VIRTUAL CHARACTERS IN MENTAL HEALTH CHATBOTS

Adding these features attempts to close the gap between human-to-human interaction and human-to-computer interac-tion. For example, the capacity of a virtual character to show subtle micro-expressions, brief facial movements that express underlying emotions, can greatly increase the user's sense of empathy and comprehension. In the same way, contextual awareness guarantees that the responses of the character are not just linguistically correct but emotionally suitable as well, considering the user's current emotional state and the general direction of the conversation.

### B. Enhancing User Engagement

Including animated characters in treatment could make it more enjoyable and less robotic. If users believe therapy to be personal and warm, they are likely to become adherent. In particular, the youngsters might find it more comfortable to relay their secrets to a friendly virtual character on their phones than to a therapist. By providing a more welcoming and engaging atmosphere, these electronic assistants success-fully remove that clinical aloofness usually associated with traditional therapy. This change is critical to user compliance; when therapy is no longer obligatory but rather a rewarding experience, clients would be inclined to actively partake in the process. Since the therapist character possesses animated facial expressions and an endearing demeanor, it can help inspire relaxed attitudes toward therapy, creating a space where users can communicate freely. This could be especially helpful for users who might be more uneasy to reach out for help, as the virtual character would be a benevolent bridge slowly helping the user transition into therapy.

### IV. AI AND NLP IN MENTAL HEALTH CHATBOTS

Incorporating animated characters can certainly make treat-ment more fun and less mechanical. People will stick with therapy if they feel it's more personalized and intimate. It is often much easier for a young person to speak with a friendly and caring young character on their phone than talking with a therapist. The intentional incorporation of animated characters into therapy platforms is intended to radically transform the user experience, turning it from a potentially clinical and cold process into one that is enjoyable and accessible.

By infusing a sense of warmth and personality, these virtual friends can have a dramatic impact on user compliance. When people feel that their therapeutic interactions are more intimate and personal, they are likely to follow the treatment plan consistently. This is due to the sense of comfort that comes with feeling like they are dealing with a friendly entity, as opposed to a simple technological device.



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### A. Natural Language Processing for Empathetic Responses

Using oral or typed input, mental health chatbots can determine a user's emotional state, using those elaborated by standard Natural Language Processing (NLP) algorithms. NLP can recognize symptoms of stress, anxiety, or depression by studying the responses, language patterns and modifying its replies to suit the needs of the user. Advanced Natural Language Processing models, like the BERT-based chatbot developed, have enabled improvements in the chatbot's abil-ity to respond with more emotionally nuanced and relevant responses in a given conversational scenario, thus enhancing the efficiency of an interaction. The development of NLP models, particularly with architectures like BERT, has signif-icantly improved the performance of mental health chatbots. A BERT-based chatbot, for example, can tell the difference between informal expressions of sadness and deeper signs of depression, thus providing the right support and referrals. This contextual understanding embodies the continuity of story across segments of conversation to ensure that the responses are thus coherent and relevant.

### B. Deep Learning for Personalization

Chatbots can become more and more intelligent by the course of time by learning from their interactions with people. This is made possible by allowing the chatbot to examine the user's past comments and emotional states, therefore prescribing current therapy for the user. This greatly aids in making therapy more engaging and individualized for every person.

Table II shows the important Artificial Intelligence and NLP features that are used in mental health chatbots.

Feature	Description
Sentiment Analysis	Identifies user's emotional state from text
	Understands context for more accurate
Context Awareness	responses
Personalization	Tailors therapy based on user history
Dialogue	
Management	Controls conversation flow naturally
	Analyzes spoken input for more natural
Voice Recognition	interactions

TABLE II KEY AI AND NLP FEATURES IN MENTAL HEALTH CHATBOTS

This closed-loop learning mechanism allows chatbots to transcend one-size-fits-all therapeutic practices, presenting in-dividualized care for real. For example, a chatbot can identify repetitively modeled emotional responses from this user base, thus allowing it to predict triggers possibly and suggest coping mechanisms R. Kaplan et al. also suggested that a chatbot could track different therapeutic techniques' effectiveness and personalize treatment away from those treatments that do not demo strong success with the individual. By indexing the past information of the user, the chatbot makes for a live and reactive therapeutic atmosphere, where the user feels heard, understood, and cared for. Of course, this level of personalization both enhances the quality of therapy and gives the sense of agency and empowerment to users whereby they become motivated to take an active role in their progress towards mental wellness.

### V. SESSION-BASED PROGRESS TRACKING

Chatbots can monitor an individual's progress through each session in therapy. This is effective and important to the pro-cess of mental health care because it assures personalization and uniformity. At the end of each therapy session, the system prepares a report that can be used in further sessions. Such reports usually may contain information on mood swings, levels, various graphs, and the overall effectiveness of the session. Besides, another advantage of the system is the in-depth reports provided at the conclusion of every session which contain useful information for the preparation of future sessions. Added to that are the reports, which not only sum-marize the key observations, but also provide an analysis of the user's emotional state, including shifting moods, identified triggers, and the degrees of success achieved with certain techniques. Representations such as graphs and charts can provide perspective to the user's progress quite succinctly and clearly so that the user and chatbot can identify patterns and trends.



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### A. Report Generation and Usage

Such reports would enable conducting a longitudinal study of the user's mental health changes over time, as well as their thoughts and emotions. These changes would provide data for the chatbot to compare and analyze across multiple therapy sessions and would provide additional avenues for customizing therapy in accordance with the user's needs. Accordingly, this provides AI-driven mental health systems a means to assess user behavior and design personalized therapy using different technologies. Through such deep insight, the AI adjusts the therapy process dynamically in tune with the evolving needs of the user. For example, if the system detects a chronic pattern of anxiety triggered by certain circumstances, it can preemptively deploy specialized coping strategies and mindfulness techniques. Likewise, if a particular therapeutic approach runs afoul, the chatbot can accommodate its evolving strategy to the more effective ones. This adaptiveness is a natural go-to for AI-enabled mental health platforms providing customized and dynamic care changes with the user.

### B. Session Feedback Loops

A mental health chatbot provides timely feedback to users' interactions with the system that can be utilized to gain an understanding of their emotions. Along with self-awareness, this feedback can help keep the user motivated to continue engaged in the therapy. The prompt feedback they provide to users on how to build self-awareness and build on that instant feedback for sustained engagement. This feedback loop allows a user to learn more about their emotional patterns and thought process, acting almost like a mirror into the inner state of the person. Its feedback on the user's observations about their language, feelings expressed, and behavior pattern will create an opportunity for self-discovery, by which a person can discover the triggers, observe coping techniques, and see how their actions and thoughts may affect them.

### VI. ETHICAL CONSIDERATIONS IN CONVERSATIONAL AGENTS

When using AI chatbots for mental health, privacy, safety, and human connection issues regarding these fully automated systems are of great concern. A study by Kretzschmar et al. indicates that youth, in particular, have more concerns about their privacy when it comes to mental health apps, especially those dealing with sensitive information. Although AI chatbots may enhance mental health treatment by providing various advantages, the threat to privacy, security, and human connection remains. Automated systems, especially in relation to sensitive information about individuals, require extreme caution related to the ethical concerns of their deployment. The central point of contention relates to data privacy since the platforms are likely to harvest and retain sensitive personal information about an individual's mental and emotional well-being. The high potential for data hacking or other types of exploitation poses almost unquantifiable risks to victims that result in a high occurrence of either emotional trauma or social stigmatization.

### A. Privacy-Preserving Mechanisms

The systems proposed employ advanced technological means of encrypting sensitive data to process it safely. Thereby, this approach helps to guard privacy, especially in healthcare applications, where protecting the confidentiality of personal information is essential. This includes strict access controls, security audits on an ongoing basis, and use and following of best practice in data management per the relevant industry standards. These processes are also particularly funda-mental in healthcare apps, where the protection of private data is, not just a matter of following the rules but a basic moral obligation. Upholding such secrecy builds trust between the user and the system, for it encourages individuals to engage candidly and sincerely in the healing process. Secure process-ing and high-quality encryption cultivate a secure domain that reduces data exposure risks. Such emphasis on data security is crucial for building user confidence and ensuring responsible deployment of AI-enabled mental health technology.

### B. Empathy in Conversational AI

Another matter of concern would be the incapacity of computers to read human emotions accurately. AI is capable of playing sympathetic; however, it would never surpass a human being. To cultivate the understanding of emotions, scientists are rehearsing the training of chatbots to spot subtle signals through individual's speech and writing. In so accepting this caveat, the scientists have pledged their commendable ambi-tion of the development of the chatbot's emotional intelligence. In other words, the prospective abilities of chatbots will include sensing the finest nuances of human feelings to allow them to respond to any given situation through their answers in an extremely nuanced and empathetic fashion. Overall, active work is a lot more complicated than mere sentiment analysis: it includes nuances of emotional expression, and then the contextual drivers behind expressions that govern the status of emotion.

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### VII. CASE STUDIES OF MENTAL HEALTH CHATBOTS

Various chatbots exist in the market for a variety of purposes ranging from moderate to significant helps in providing mental health care. The two chatbots below-Wysa and Woebot-are dis-played on this blog, they exemplify the viable implementation of AI and NLP in mental health care. The burgeoning field of AI-based mental health assistance has come into its own with the introduction of various chatbots, each pursuing a slightly different philosophy and with differing degrees of success. These programs are the recognition of applied AI and Natural Language Processing searching for solutions to mental health problems and providing cheap and convenient assistance to the population worldwide. Among them, Wysa and Woebot stand out as powerful representatives of what such technology could achieve in the future concerning mental healthcare.

### A. Case Study 1: Wysa

Wysa is an Artificial Intelligence-driven metal health chat-bot designed to provide help to those with mental health problems: stress, anxiety, and depression. In particular, it is based on Cognitive Behavioral Therapy (CBT), a type of treatment that helps a patient to control negative thoughts and attitudes. Wysa has sessions based on the progress of users and adapts future treatment depending on their previous responses. Wysa also provided tools for mindfulness techniques and mood tracking. As users continue to interact with the chatbot, and provide feedback, sessions are adjusted in line with the ther-apeutic protocol to suit individual needs, moving along with the patient's unique emotional state. This leads to a dynamic support structure, whereby care is seen to be personalized and effective. More importantly, Wysa goes a step further from delivering basic CBT techniques.

### B. Case Study 2: Woebot

The chatbot communicates with users in a style that is both conversational and soothing. Each day Woebot checks in, asks questions about one or more of the most common feelings people may experience, and interprets an answer to give feedback to help achieve a healthier state of mind. Woebot is designed with daily check-ins that actively track the users' emotional lives. By encouraging users to look inward and describe their thoughts and feelings, it collects data that's very valuable for evaluation and treatment. In so doing Woebot provides some interpretation of the responses and personal feedback according to CBT principles.

### VIII. CONCLUSION

Animated characters born through technology, combined with personalization in treatment, could trigger a lot of changes in the mental health space. Compared to text-based models, individuals are more engaged and feel connected to animated characters; this helps in monitoring the progress between the sessions and helps with planning a more indi-vidualised treatment process. Mental Maven aims to enhance the mental health treatment while also overcoming the privacy issues in technology and making a more empathetic approach to technology. The experience can be elevated by utilising more innovative and specialised artificial intelligence and innovative design. The field has an untapped potential that can revolutionise the space through research and development and benefit individuals facing mental health challenges. Another important benefit of Mental Maven is the capacity to monitor progress from one session to another and adjust treatment plans according to individual requirements. Through the use of data analytics and AI-driven algorithms, the platform can monitor user participation, changes in mood, and the efficacy of different therapeutic modalities. This analytical facility enables the development of highly personalized treatment plans that provide the individual user with customized support appropriate to their specific situation.

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