



A Digital Diary and AI Chatbot for Mental Well- being Support

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Abstract

In recent years, intellectual fitness troubles including stress, anxiety, and despair have ended up more and more normal among college students and professionals. Regular journaling and emotional expression had been validated to enhance self-recognition and enhance mental well-being, yet conventional strategies regularly lack engagement and wise feedback.

To deal with this gap, this assignment offers a wise virtual platform that mixes deep gaining knowledge-of-primarily based totally emotion detection and AI-pushed interaction to aid customers' intellectual fitness. The machine allows customers to document day by day magazine entries even as robotically detecting their emotional nation, the usage of each textual content sentiment evaluation and facial emotion recognition. A fine-tuned RoBERTa version plays textual content-primarily based totally emotion detection to categorise sentiments as positive, negative, or neutral, even as a custom-educated deep gaining knowledge of version in addition identifies particular moods including joy, sadness, fear, and surprise. In parallel, face-api.js, primarily based totally on Convolutional Neural Networks (CNNs), analyzes facial expressions captured via pictures to decide visual emotions.

Based on those results, the machine provides customized suggestions including calming tunes and stress-relieving video games to enhance the person's mood.

Furthermore, the platform integrates authentication for steady persons to get admission to and MongoDB for dependent information storage. In the future, an AI chatbot will be introduced to provide conversational emotional aid, encouraging self-mirrored image and decreasing intellectual isolation. This holistic technique now no longer handiest promotes emotional recognition however additionally leverages synthetic intelligence to create a supportive, adaptive, and person-pleasant virtual well-being Companion.

Keywords: Mental Health; Emotion Detection; Digital Diary; Sentiment Analysis; Facial Emotion Recognition; Artificial Intelligence; Deep Learning; RoBERTa; Chatbot; Well-Being.

1. Introduction

Mental fitness demanding situations like stress, anxiety, and emotional misery have ended up widespread, mainly amongst college students and specialists going through deadlines, competition, and private responsibilities. Many people hesitate to percentage their emotions because of worry of judgment, which ends up in the suppression of their emotions. Over time, this may significantly affect their normal well-being. Keeping a magazine to document the mind is one of the simplest approaches to acquire readability concerning one's emotions, however a conventional diary lacks the ability to manual the person or examine their emotions.

Recent improvements in synthetic intelligence have made it viable to create structures which could locate patterns, recognise text, or even understand emotions. Our task makes use of those improvements to create a clever virtual diary that fosters emotional well-being. This platform permits customers to document their magazine entries of their desired language whilst additionally shooting their facial expressions to evaluate their mood. Based on this emotional evaluation, it indicates easy activities, like soothing songs or games, meant to lessen stress.

The predominant purpose of this task is to increase a worrying virtual accomplice that listens, comprehends, and gives encouraging responses. By integrating journaling, emotion recognition, and AI-powered interactions, the machine pursuits to make emotional assistance greater reachable and high quality for people who find it hard to express their emotions openly.

2. Literature Survey

In today's fast-transferring world, generation is turning into deeply concerned in our day-to-day lives, and synthetic intelligence is now assisting us to apprehend feelings higher than ever before. Many college students and working professionals war with pressure, deadlines, and social expectations, which frequently influences their intellectual health. Because humans don't continually experience snug beginning as much as others, there's a developing want for virtual equipment which can provide emotional aid in a secure and judgment-free manner [1][2]. This has stimulated researchers to examine how AI can become aware of feelings and help individuals who can be going through hard moments.

To attain this, strategies like deep getting to know and Natural Language Processing (NLP) play a crucial role. Models inclusive of RNNs and more modern transformer-primarily based total structures like RoBERTa can examine written textual content and discern out the emotion at the back of it.

On the opposite hand, Convolutional Neural Networks (CNNs) are typically used to examine facial expressions—whether or not a person appears happy, sad, angry, or surprised [7][11]. These technologies make it feasible for AI to apprehend each of the phrases we write and the expressions we show.

Alongside emotion detection, AI chatbots have additionally grown to be an effective manner to provide aid. They permit customers to speak freely, percentage feelings, and acquire steering without stressful approximately being judged. This makes conversations experience extra herbal and comforting.

Our undertaking brings these types of thoughts collectively through constructing a virtual magazine that now no longer best saves day by day entries however additionally analyzes feelings from textual content and facial expressions. By combining each input, the device can offer extra personalized, meaningful, and real-time emotional aid.

3. Related Work

1. User Engagement, Attitudes, and Effectiveness of Chatbots as a Mental Health Intervention: A Systematic Review (2024)

In their evaluation, Sucharat Limpanopparat and co-workers tested the usage and personal responses to intellectual-fitness chatbots. Their studies indicated that once chatbots adhere to powerful virtual-remedy methods, customers are much more likely to have interaction continually and show off improvements, in particular in depressive symptoms. Many people pay chatbots for his or her steady availability and their friendly, supportive way of communication. Nevertheless, the effectiveness of those chatbots hinges on their design, the healing version employed, and the volume to which the AI generation comprehends the person's needs. The authors advocate that extra standardized research is required to discover which functions have the maximum vast impact.

2. AI Chatbots for Mental Health: A Scoping Review of Effectiveness, Feasibility, and Applications (2024)

Mirko Casu and his studies crew investigated the deployment of AI chatbots in addressing diverse intellectual-fitness troubles consisting of anxiety, depression, and emotional misery in the course of the COVID-19 pandemic. They determined that chatbots furnished precious emotional aid and encouragement for healthful behaviors. However, in addition they located that person's engagement numerous and now no longer all chatbots have been powerful for each individual. The authors concluded that extra paintings are vital to decorate the usability, personalization, and protection of those chatbots earlier than they may be extensively followed in healthcare environments.

3. Mental Health Chatbot for University Students Support and Encouragement (2024)

Tapiwa Tauro and co-workers evolved an intellectual-fitness chatbot tailor-made mainly for college students in Zimbabwe. This chatbot applied reason classification, entity recognition, and rule-primarily based totally communication era to interpret college students' expressions. It furnished coping techniques and emotional aid aligned with their particular concerns. While college students observed the chatbot beneficial, it every so often produced beside the point replies and struggled to control complicated discussions. The look at emphasizes that even as such chatbots can help college students, they can't totally update human counselors.

4. Enhancing Mental Health with Artificial Intelligence: Current Trends and Future Prospects (2024)

David B. Olawade and his team explained that different AI tools, such as text analysis, speech analysis, and facial emotion recognition, help in identifying mental health problems at an early stage. These tools can understand a person's emotions and behavior, making early detection easier and more effective. They highlighted that AI can support people living in areas with very few mental health services. They also mentioned risks related to user privacy, biased AI outcomes, and systems that do not clearly explain how decisions are made. According to them, AI can be beneficial, but clear moral guidelines are needed to avoid misuse.

5. Chatbots and Mental Health: A Scoping Review of Reviews (2025)

Eric Mayor conducted an analysis of 17 reviews to survey the current state of intellectual-fitness chatbots. He found that overall research level is rising, although current research still predominantly uses small sample sizes and has limited long-term analysis. Users appreciate chatbots' lack of judgment and empathy, although conversations can be boring at times. Mayor advocates for destiny studies to undertake extra sturdy methodologies and long-time period scientific evaluations.

6. Unleashing the Potential of Chatbots in Mental Health: Bibliometric Analysis (2025)

Qing Han and Chenyang Zhao explored international studies developments concerning intellectual-fitness chatbots from 2015 to 2024. Their evaluation highlighted a fantastic growth in publications, in particular following the COVID-19 pandemic. They additionally pinpointed vast studies areas, inclusive of usability, the utility of AI in scientific contexts, and virtual healing interventions. Their look at shows that chatbots will preserve upward thrust in importance, but there may be an urgent want for specific moral and regulatory standards.

Table 1: Overview of Related Work on AI Chatbots for Mental Health

Title of Paper	Year	Methodology / Algorithms	Key Findings	Research Gaps / Limitations
"User Engagement , Attitude and Effectiveness of chatbots "	2024	Systematic Review (PRISMA 2020), Narrative Synthesis, MMAT	Effective for depression; User attitude and engagement influence success	Few studies combine all factors; Lacks demographic-specific data and standard measures
"AI Chatbot Chatbot for Mental Health: A Scoping Review "	2024	Scoping Review (PRISMA-ScR), RCTs, Mixed methods; AI, NLP, ML, LLMs (GPT-4, Mental-Alpaca)	Effective for depression, anxiety, addiction; High engagement during COVID-19	Challenges with usability, personalization; integration into health systems; Few long-term RCTs; Ethical concerns
"Mental Health Chatbot for University Students(HEOM Germany)"	2024	Agile Kanban; RASA (NLU + NLP)	Reduced stigma; Peer-like support for students	Limited to one university; Accuracy issues; Not generalizable
"Enhancing Mental Health with AI (JMSPH)"	2024	Narrative review of 92 studies (2019–2023); NLP, ML, Facial Recognition	AI enables early diagnosis; Personalization improves therapy	No solid clinical trials; Ethical issues like bias and privacy
"Chatbots and Mental Health: A Review of Reviews (Current Psychology)"	2025	Review of 17 past reviews; Tools: Dialogflow, RASA	iCBT is effective; Chatbots build therapeutic alliances	Mostly small-scale studies; No standard chatbot design practices
"Unleashing the Potential of Chatbots (Frontiers in Psychiatry)"	2025	Bibliometric analysis (261 papers); Tools: Biblioshiny, VOSviewer	Field is growing fast; Focus on LLMs, CBT, mHealth	No multilingual/topic modeling; Excludes gray literature

4. Gap Analysis

Applications in this area provide different features, but these features appear in different forms. Most applications focus on one particular feature, such as writing about emotions or practicing methods for reducing stress. They do not combine multiple features that relate to understanding emotions in one system. Applications that examine text show basic analysis only. This analysis indicates whether text reflects positive feelings,

negative feelings, or neutral feelings. This approach does not allow understanding of detailed emotional conditions that individuals experience.

Another limitation involves the use of multiple methods for detecting emotions. Research shows that combining analysis of facial features with analysis of text provides more accurate understanding of emotional states [14]. Many applications that operate in real settings use only one method. Systems that detect emotions from facial features in real time appear less often, particularly in systems that operate through web platforms.

Systems that offer support for mental health rely on rule-based methods. These systems match with some words that the user provides. They do not examine the emotional tone that users show in their messages. They do not change responses to reflect the emotional context. Features that provide suggestions based on individual characteristics appear less often. These features include suggesting music or suggesting small activities that relate to the emotional state that users show.

Tracking emotional patterns over time does not receive sufficient focus in current systems. Some applications allow individuals to record their moods, but this process requires manual input from users. Few systems store emotional data and examine patterns in this data using both facial analysis and text analysis that operate automatically [3][9].

Many systems that students develop do not include features that allow secure login or features that allow deployment through cloud services. These systems also lack proper backend structures. This limits their use in real settings. The system that this work presents addresses these limitations. It combines multiple features in one platform. These features include text analysis using RoBERTa, analysis of facial features, journaling, interaction with a system that responds to messages, records of emotional states over time, and suggestions that relate to wellness.

5. Conclusion

This survey presents how artificial intelligence is getting more relevant to assist on the well-being of human beings, highlighting at the same time the lacks that can still be observed in digital systems nowadays. Currently most of the apps just focus on a few features such as journals, meditation or simple sentiment analysis, and they are not able to give an adequate understanding of the user's emotion.

The analyzed works have demonstrated that the use of multimodal emotion detection, i.e. using both text and facial expressions, is effective in research and has been widely used in real mental-health applications. Similarly, many of the digital chatbots that exist today are unaware of emotions, do not provide personalized responses, and often do not understand what the user says, making their support superficial.

This survey proposes the use of an integrated system that combines both NLP models to understand the user's emotion in text, real-time facial emotion recognition, personalized recommendations, and long-term mood

tracking as a way to bridge the gap between simply identifying the emotions and providing real emotional support from the system, providing the user with a more adequate, comprehensive, human-like, and empathic experience.

The proposed approach to fill the above gaps will be achieved by using modern deep-learning models, scalable web technologies, and wellness activities such as soothing music, mindful games, and AI-based conversational assistance.

In summary, the survey has concluded that using multiple different emotion-detection techniques combined with adaptive and personalized assistance will significantly enhance the performance of digital mental-health platforms.

For future work, the use of bigger datasets, more accurate models, multi-language, and more generative AI models to enhance empathy and personalized recommendations will be explored. With the continuous development of the technology, it is expected that these systems will become more accessible, responsive and effective tools to assist in emotional well-being.

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Disclosure of Interests

The authors have no competing interests to declare that are relevant to the content of this article.

6. References

- [1] Z. Zhang, Y. Song, H. Xu, and T. Liu, "Emotion detection using machine learning: A review," *IEEE Access*, vol. 8, pp. 191144–191165, 2020.
- [2] R. Islam, S. M. Kibria, S. A. R. Sifat, and M. N. Nafi, "Artificial intelligence to combat the COVID-19 crisis and mental health challenges: A review," *Health and Technology*, vol. 11, pp. 1095–1107, 2021.
- [3] X. Ma and Y. Wang, "Deep learning for mental health prediction: Methods and applications," *ACM Computing Surveys*, 2021.
- [4] G. Reddy and P. Mukherjee, "Sentiment and emotion analysis for mental health monitoring: A transformer-based approach," *Procedia Engineering*, vol. 212, pp. 101–109, 2021.
- [5] H. K. Bali and N. S. Dahiya, "Mental health support using artificial intelligence: A review," *Materials Today: Proceedings*, vol. 62, pp. 3947–3951,

2022.

[6] S. Shahid, A. K. Jha, and M. K. Tiwari, "Artificial intelligence and machine learning applications in mental health: A scoping review," *Journal of Intelligent & Fuzzy Systems*, vol. 43, no. 3, pp. 2491–2507, 2022.

[7] A. Deshpande and V. Kulkarni, "Real-time emotion detection using face-api.js and CNN models," *International Journal of Computer Vision and Signal Processing*, 2022.

[8] S. R. Patel and P. Shah, "Emotion detection using RoBERTa and XLNet models for counseling applications," *Procedia Engineering*, vol. 263, pp. 440–447, 2022.

[9] S. Jayawardena and A. Pathirana, "Digital mental health solutions for students in higher education: A scoping review," *Digital Health*, vol. 9, pp. 1–17, 2023.

[10] M. S. Woolf and N. Lambert, "AI chatbots for mental health support: A review of applications and challenges," *Journal of Medical Internet Research*, 2023.

[11] T. Nguyen, P. Do, and K. Tran, "Facial emotion recognition in real-time using lightweight convolutional neural networks," *Journal of Visual Communication and Image Representation*, vol. 92, pp. 103–118, 2023.

[12] S. Gupta, R. Kaur, and P. Singh, "AI-driven chatbot systems for mental health support: Trends and challenges," *Journal of Affective Computing*, vol. 12, no. 4, pp. 512–526, 2023.

[13] S. Limnapopparat, E. Gibson, and A. Harris, "User engagement, attitudes, and the effectiveness of chatbots as a mental health intervention: A systematic review," *Computers in Human Behavior: Artificial Humans*, vol. 2, 2024.

[14] M. Alqahtani and L. Kavakli, "Multimodal emotion recognition for mental health monitoring: A comprehensive review," *IEEE Transactions on Affective Computing*, 2024.

[15] E. Mayor, "Chatbots and mental health: A scoping review of reviews," *Current Psychology*, 2025.

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