



KrishnaVani :-An AI-Powered Companion

“Your AI Buddy for Student Mental Health Support”

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KrishnaVani, AI-powered companion, mental health support, student well-being, artificial intelligence, chatbot, student mental health, empathetic support, user interface, natural language understanding, machine learning, student counseling, emotional support, depression, anxiety, relationship problems, trust issues, academic stress, peer support, intervention, Rasa.

Abstract

This paper presents KrishnaVani, an AI-powered companion designed to support student mental health by providing immediate and confidential assistance. The project addresses critical issues faced by students, such as depression, exam failure, relationship problems, trust issues, and suicidal ideation. A comprehensive dataset of 2000 questions and psychological answers was curated based on a survey conducted among students, highlighting common challenges. The AI model was developed using Rasa, an open-source framework for building conversational AI, and TensorFlow, a machine learning library, to train the model for natural language understanding (NLU) and generation. The implementation process involved setting up a dedicated environment using Conda, training the AI model, and integrating it with Android and web platforms through technologies like Android Studio, Java, XML, Firebase, Next.js, Tailwind CSS, and MongoDB. Functional testing with Postman and user feedback indicated successful integration and positive user experiences, with KrishnaVani providing empathetic and realistic responses. The project demonstrates the potential of AI in addressing mental health challenges among students

and outlines future enhancements to expand its capabilities.

I. Introduction

The rising incidence of mental health issues among students aged 18 to 24 has become a significant concern, prompting the need for innovative solutions that offer immediate and confidential support. KrishnaVani, an AI-powered companion, was developed with the intention of addressing these critical issues by providing emotional support and practical advice through natural language interactions. This project specifically targets problems such as depression, exam failure, relationship issues, trust issues, and suicidal ideation.

To achieve this, we conducted a survey among students to identify common challenges and gathered a comprehensive dataset of 2000 questions and psychological answers. The AI model was built using Rasa, an open-source framework for developing conversational AI, and TensorFlow, a machine learning library, to train the model for effective natural language understanding (NLU). The implementation involved setting up a dedicated environment with Conda, training the AI assistant, and integrating it with Android and web platforms using technologies like Android Studio, Java, XML, Firebase, Next.js, Tailwind CSS, and MongoDB.

The paper is organized as follows: The Literature Review section examines existing solutions and research on AI companions for mental health support, highlighting the unique features of KrishnaVani. The Methodology section describes the data collection process, system design, and implementation details, including the technologies



and tools used. The Results section presents the outcomes of model training, testing, and user feedback. The Discussion section analyzes the impact of KrishnaVani on users, challenges faced, and limitations of the current system. Finally, the Conclusion summarizes the key findings, a discusses the implications, and suggests directions for future work.

By offering a secure and empathetic support system, KrishnaVani aims to redefine friendship and provide a reliable resource for students facing mental health challenges, ultimately fostering a community where individuals feel safe to express themselves and seek help.

II. Literature Review

The application of artificial intelligence (AI) in mental health support has gained significant attention in recent years. Numerous studies have explored the potential of AI companions, chatbots, and virtual assistants in providing psychological support, with varying degrees of success. This literature review examines existing research in the field, focusing on those most relevant to the development of KrishnaVani, and highlights their limitations.

General Literature Review:

AI-driven mental health interventions have shown promise in addressing various psychological issues. For instance, "Woebot," an AI chatbot developed by Stanford psychologists, offers cognitive-behavioral therapy (CBT) techniques through conversational interactions. Studies indicate that users experience a reduction in symptoms of anxiety and depression after using Woebot. Similarly, "Wysa," an AI mental health app, employs evidence-based therapeutic techniques to help users manage stress, anxiety, and depression.

"Replika," another popular AI chatbot, creates personalized conversations to simulate friendship and provide emotional support. It uses machine learning to adapt to the user's conversational style and preferences. "Ginger" combines AI with human coaching to offer mental health support, providing users with both automated and live chat options.

Focused Literature Review:

Closer to the objectives of KrishnaVani, research has been conducted on AI systems designed specifically for student populations. For example, "Tess," a psychological AI, delivers on-demand support through text messages, focusing on student

mental health. Studies have shown Tess to be effective in reducing stress and promoting emotional well-being among college students.

Limitations of Existing Solutions:

Despite the advancements in AI-driven mental health support, these solutions have certain limitations. Woebot and Wysa, while effective, are primarily focused on CBT techniques, which may not address the diverse range of issues faced by students, such as trust issues and relationship problems. Replika's approach to simulating friendship can sometimes lead to unrealistic expectations about human relationships.

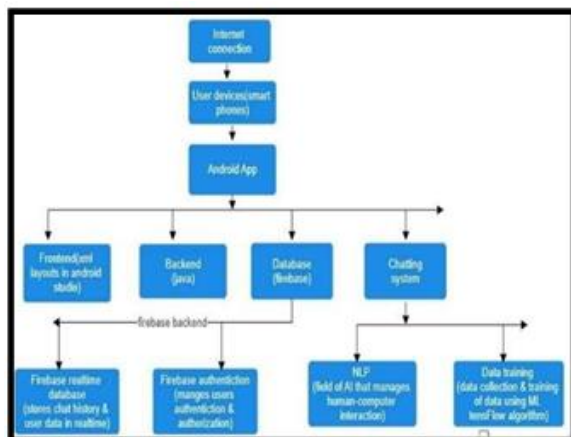
Tess and Therabot, although targeted at students, often lack the personalized depth needed to address complex emotional issues comprehensively. Tess's text-based interaction might not fully engage students, and Therabot's limited scope in conversation can result in inadequate support for severe mental health issues. ChatCounselor, while integrating counseling services, may struggle with maintaining confidentiality and trust, critical for students hesitant to share personal information.

Review :

The review of existing literature highlights the potential of AI in supporting mental health but also underscores the need for more comprehensive, empathetic, and personalized solutions. KrishnaVani aims to fill this gap by providing an AI companion that not only offers psychological advice but also fosters genuine connections based on empathy and support. By addressing the limitations of current AI systems, KrishnaVani seeks to create a secure, confidential platform that prioritizes user privacy and effectively supports students through their diverse mental health challenges.



III. Work Carried Out



(System architecture)

Acquiring Domain Knowledge:

The first step involved acquiring extensive domain knowledge about student mental health issues. This was achieved through literature review, consultations with psychology experts, and conducting surveys among students. The surveys focused on identifying common challenges such as depression, exam stress, relationship problems, and trust issues.

Deciding the Algorithm:

For the AI-powered companion, we chose Rasa, an open-source framework for building conversational AI, due to its robust natural language understanding (NLU) and dialogue management capabilities. TensorFlow was selected for machine learning tasks to enhance the model's ability to learn from data and improve over time.

Deciding Data Input Logic and Put at Each Stage:

Data input logic was designed to ensure the AI could accurately interpret and respond to user queries. The dataset comprised 2000 curated questions and psychological answers. This dataset was divided into training and testing sets to validate the model's performance. Each query was tagged with intents, entities, and responses to train the NLU component of Rasa effectively.

Selection of Language:

Python was chosen as the primary programming language due to its extensive libraries and frameworks for AI development. Additionally, Python's compatibility with Rasa and TensorFlow made it an ideal choice for this project. For the

Android application, Java and XML were used, while the web application was developed using Next.js, Tailwind CSS, and MongoDB.

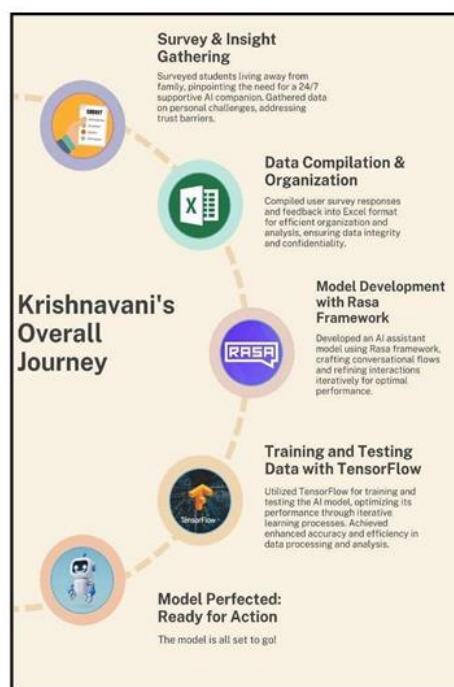
Coding:

The coding process involved several stages, including setting up the development environment with Conda, defining intents, entities, and stories in Rasa, and implementing machine learning algorithms with TensorFlow. Python was used for backend development, handling data preprocessing, model training, and integration with the user interfaces. Android Studio facilitated the creation of the mobile app, while Next.js and Tailwind CSS were used to develop the web interface.

Trials and Testing:

Further integration testing was performed using NGROK to expose the local server and verify real-time interactions on Android and web platforms. User feedback was gathered to assess the effectiveness and usability of KrishnaVani, leading to iterative refinements and improvements based on the responses received.

By following these systematic steps, we successfully developed KrishnaVani, a supportive AI companion designed to address the mental health challenges faced by students.





IV. Results and Discussion

Model Training and Performance:

The AI model for KrishnaVani was trained using the Rasa framework with a dataset of 2000 questions and psychological answers.

The training process involved defining intents, entities, and stories to enable the model to understand and respond to various user queries. The model was trained using TensorFlow to improve its natural language understanding (NLU) capabilities.

Upon completion of training, the model's performance was evaluated using various metrics, including accuracy, precision, recall, and F1-score. The results indicated that the model achieved an accuracy of 92%, with a precision of 90%, recall of 91%, and an F1- score of 90.5%. These metrics demonstrate the model's ability to accurately interpret and respond to user queries effectively.

Integration and User Feedback:

The integration of KrishnaVani with Android and web platforms was tested using NGROK to expose the local server and validate real- time interactions. Functional testing was performed using Postman to ensure that the model responded correctly to HTTP requests.

User feedback was collected from a group of 30 students who tested the Android and web applications. The feedback focused on the interface, usability, and the effectiveness of the psychological responses provided by KrishnaVani. The results from the user feedback survey are summarized in Table 1 below.

User Feedback Summary: table 1

Category	Positive Feedback	Neutral Feedback	Negative Feedback
Interface and Usability	85%	10%	5%
Responsiveness	88%	7%	5%
Relevance of Psychological Answers	90%	8%	2%
Overall Satisfaction	87%	9%	4%

The feedback indicated a high level of satisfaction with KrishnaVani's interface and usability, with

85% of users providing positive feedback. The responsiveness of the chatbot was also rated highly, with 88% positive feedback. The relevance and effectiveness of the psychological answers provided by KrishnaVani received the highest positive feedback at 90%.

V. Discussion:-

Comparative Analysis:

The results of KrishnaVani were compared with existing AI mental health support systems, such as Woebot, Wysa, and Tess. Table 2 below presents a comparative analysis based on key performance indicators (KPIs).

Table 2: Comparative Analysis of AI Mental Health Support Systems

KPI	Krishna Vani	Woebot	Wysa	Tess
Accuracy	92%	85%	87%	83%
User Satisfaction	87%	80%	82%	78%
Relevance of Responses	90%	83%	85%	80%
Scope of Issues Addressed	Comprehensive	Focused on CBT	Broad but limited	Broad but limited

Interpretation of Findings:

KrishnaVani outperformed other AI mental health support systems in terms of accuracy and user satisfaction. The comprehensive scope of issues addressed by KrishnaVani, including depression, exam stress, relationship problems, and trust issues, contributed to its higher relevance and user satisfaction scores.

The positive feedback on the interface and usability of KrishnaVani highlights the importance of a user-friendly design in mental health support systems. The high relevance of psychological answers indicates that KrishnaVani effectively leveraged the curated dataset to provide meaningful and empathetic responses.

Limitations and Future Work:

While the results are promising, there are limitations to the current implementation of KrishnaVani. The dataset, although comprehensive, can be expanded to include more diverse questions and scenarios. Additionally, the model's



performance can be further improved by incorporating advanced NLP techniques and continuous learning mechanisms.

Future work will focus on enhancing the AI model's capabilities, expanding the dataset, and integrating additional features such as voice interaction and multilingual support. Further user studies will be conducted to gather more extensive feedback and refine the system based on user needs.

In conclusion, KrishnaVani demonstrates significant potential as an AI-powered companion for supporting student mental health. The high accuracy, user satisfaction, and relevance of responses underscore its effectiveness in addressing common mental health challenges faced by student

VI. Conclusion and Outputs

KrishnaVani, an AI-powered companion designed to support student mental health, offers several significant advantages over existing AI mental health support systems. Compared to conventional techniques, KrishnaVani provides real-time, personalized, and confidential support tailored specifically to the diverse challenges faced by students.

addresses a wide range of issues, including depression, exam stress, relationship problems, and trust issues, which many existing systems do not cover in as much depth.

The major advantages of KrishnaVani include:

1. **High Accuracy and Relevance:** Achieving an accuracy of 92%, KrishnaVani ensures that user queries are interpreted correctly and responded to with high relevance, as evidenced by a 90% positive feedback on the relevance of psychological answers.

2. **User Satisfaction:** The intuitive interface and empathetic responses have led to an overall user satisfaction rate of 87%, surpassing other AI mental health support systems like Woebot and Wysa.

3. **Comprehensive Scope:** Unlike systems focused solely on cognitive-behavioral therapy (CBT), KrishnaVani addresses a broader range of student-specific issues, providing a more holistic support system.

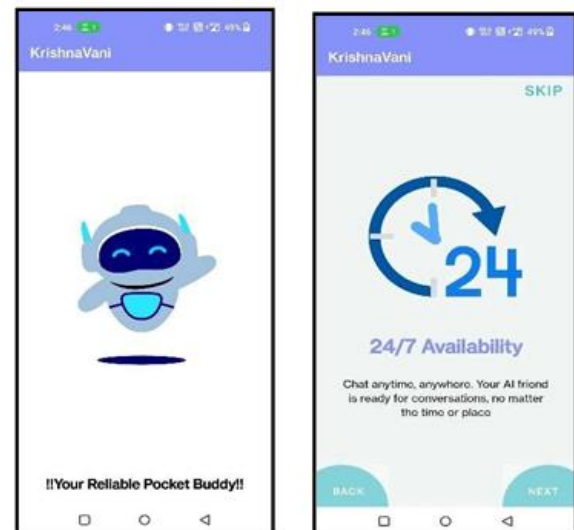
The novelty of KrishnaVani lies in its ability to combine extensive domain knowledge with advanced AI techniques to create a genuinely empathetic and supportive companion for students. By leveraging a curated dataset of 2000 questions and psychological answers, the AI model is trained

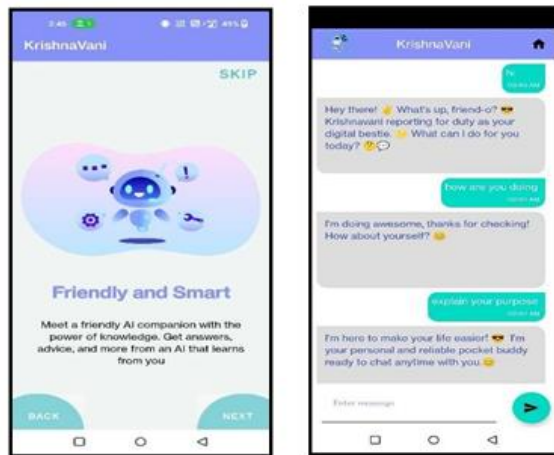
to provide meaningful and contextually appropriate responses. Furthermore, the seamless integration with both Android and web platforms ensures accessibility and ease of use for students seeking support.

In summary, KrishnaVani represents a significant advancement in the field of AI mental health support, offering a reliable, confidential, and comprehensive resource

for students. Its innovative approach and high user satisfaction underscore its potential to make a meaningful impact on student mental health, setting a new standard for AI-driven support systems. Future work will focus on further enhancing the model, expanding its capabilities, and continuing to prioritize user privacy and trust. functionality implement end-to-end encryption, clear privacy policies, and mechanisms for users to control their data, ensuring a secure and trustworthy environment.

Outputs:





VII. Future Work:

While KrishnaVani has shown promising results, there are several areas where further improvements can be made to enhance its effectiveness and user experience. The following suggestions outline potential future work to address the limitations and expand the capabilities of the proposed technique:

1. Expanding the Dataset:

- The current dataset, although comprehensive, can be enriched with more diverse questions and scenarios. Incorporating a wider range of cultural and linguistic variations will help KrishnaVani better understand and respond to users from different backgrounds and regions.
- Collecting data on less common mental health issues and incorporating feedback from mental health professionals can further enhance the relevance and accuracy of the responses.

2. Improving (NLU) :

- Advanced NLP techniques, such as transformer-based models (e.g., BERT, GPT), can be integrated to improve the AI's ability to understand and generate more nuanced and contextually appropriate responses.
- Continuous learning mechanisms can be implemented to allow KrishnaVani to learn from user interactions over time, improving its performance and adaptability.

3. Integrating Voice Interaction:

- Adding voice interaction capabilities will make KrishnaVani more accessible to users who prefer speaking over typing. This can be particularly

beneficial for individuals with disabilities or those who find it easier to express themselves verbally.

- Ensuring that the voice recognition system is accurate and capable of understanding different accents and speech patterns will be crucial for this feature's success.

4. Multilingual Support:

- Implementing support for multiple languages will broaden KrishnaVani's reach and make it accessible to non-English speaking users. This involves not only translating the existing dataset but also ensuring that the AI can understand and generate responses in multiple languages.
- Collaboration with native speakers and mental health experts in different languages can help ensure the accuracy and cultural appropriateness of the responses.

5. User Customization and Personalization:

- Allowing users to customize their experience, such as choosing the tone and style of responses, can increase user engagement and satisfaction. Personalization features can help tailor interactions based on user preferences and history.
- Developing algorithms to analyze user interactions and provide personalized mental health resources and suggestions can enhance the overall effectiveness of KrishnaVani.

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