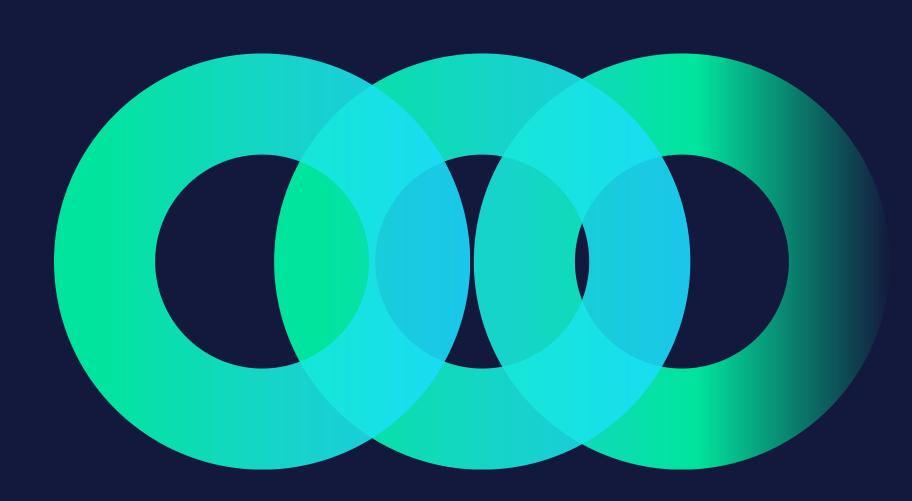
Group 54 CHATBO

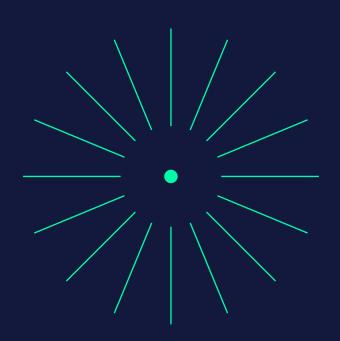
TEAM MEMBERS:

MANSI SHARMA
ISHAAN CHAUHAN
ARJUN MOITRA
PARAM KUMAR RAMAN
HIMANSHU CHAUHAN
ANKIT RAJ



Table Of Contents

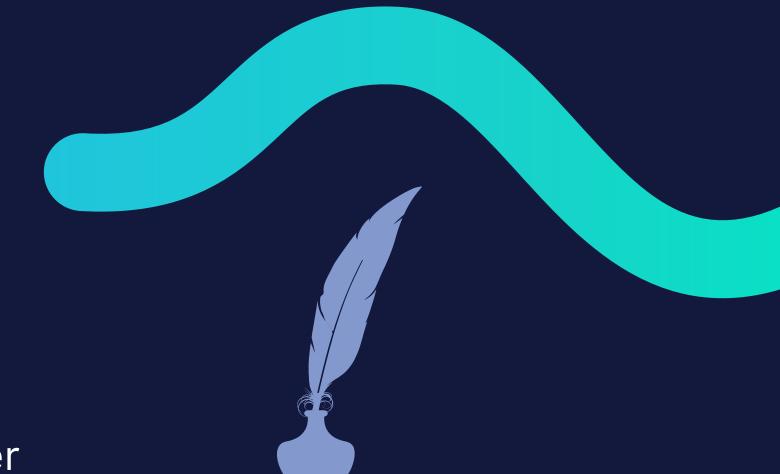




- Problem Statement
- Motivation
- Literature Review
- Proposed Solution in detail
- Novelty
- Problems to be Solved
- Methodology
- Results

INTRODUCTION

Our project introduces an AI-driven chatbot tailored to enhance learning experiences for students and educators. By offering personalized assistance and leveraging advanced technology, the ITA chatbot aims to transform traditional education and empower learners to succeed in the digital age.





PROBLEM STATEMENT

The traditional education system faces scalability, personalized learning, and efficient administrative support challenges. Sometimes, educators find it time-consuming to perform administrative tasks. The need for a solution that bridges these gaps and enhances the educational experience has become evident.

MOTIVATION





Our project aims to create a chatbot that enriches student learning, making education engaging, effective, and tailored to individuals.



Dedicated to AI for equal education access, ensuring all students have opportunities for learning and success.

Supporting Educator Efficiency

We wish to automate admin tasks, provide tools for educator efficiency, enabling focus on teaching and mentoring.



Addressing Evolving Educational Needs

Motivated to address evolving education needs, providing innovative solutions for students and educators in digital age.

Empowering Student Success

Driven to empower students for academic and personal success by providing resources, support, and personalized assistance.

Making a Positive Impact

Motivated by the belief that our project can positively impact students, educators, and the global educational community.

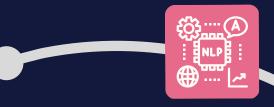






LITERATURE REVIEW

- Advantages of Chatbots in Education: Studies by [1] and [2] have demonstrated the benefits of chatbots in providing personalized learning experiences and facilitating student-teacher interactions.
- Challenges and Limitations: While chatbots offer significant potential, challenges such as limited natural language understanding and ethical considerations have been identified [3].
- Pedagogical Roles of Chatbots: Research by [4] emphasizes the importance of chatbots in various pedagogical roles, including tutoring, mentoring, and assessment.
- Design Principles: Studies by [5] have explored design principles for educational chatbots, highlighting the importance of user-centered design and adaptive learning pathways.



Advaced NLP

- Implement state-of-the-art NLP algorithms to enhance the chatbot's understanding and generation of human-like responses.
- Incorporate sentiment analysis to detect and respond to students' emotional cues effectively.

OUR SOLUTION STEPS IN DETAIL

Our solution embodies an innovative approach, combining novel methods and creative strategies tailored to meet the unique needs and challenges of the project. With a customized plan incorporating bespoke elements, we strategically implement a step-by-step process to ensure effective execution and optimal utilization of resources.



Seamlessly integrate the chatbot with existing learning management systems used by educational institutions to streamline access to course materials, assignments, and grades.



- Utilize structured data markup such as schema.org to provide search engines with detailed information about the chatbot's content and purpose.
- Enhance search engine results with rich snippets and featured snippets for relevant queries.



- Implement PWA features to enable offline access and native app-like functionality on both phones and laptops.
- Utilize service workers to cache resources and provide a consistent experience regardless of network connectivity.

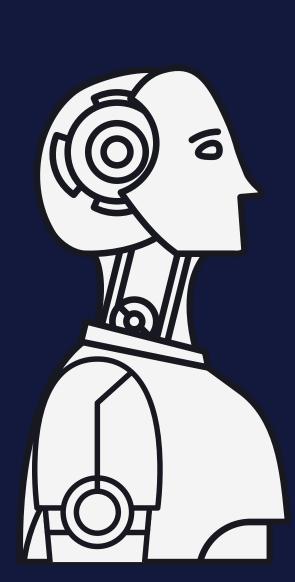
Responsiveness

Design the ITA Chatbot interface to be responsive, allowing seamless interaction across different devices and screen sizes.

INNOVATIVE ADDITIONS



for an Enriched Learning Experience





Utilizing advanced analysis, our chatbot assesses user performance, learning preferences, and identifies strengths and weaknesses. This data powers dynamic adjustments in learning paths, offering personalized study plans, curated resources, and tailored activities aligned with each student's unique needs and objectives.

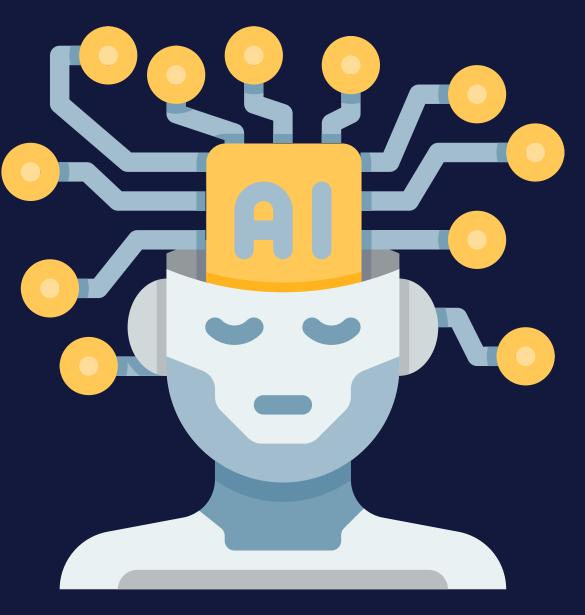
The chatbot offers advanced voice recognition technology, allowing users to engage in natural and hands-free interactions by simply speaking their queries or commands. This innovative feature enhances accessibility and convenience, enabling users to interact with the chatbot effortlessly, especially in situations where typing may be inconvenient or impractical.





NOVELTY

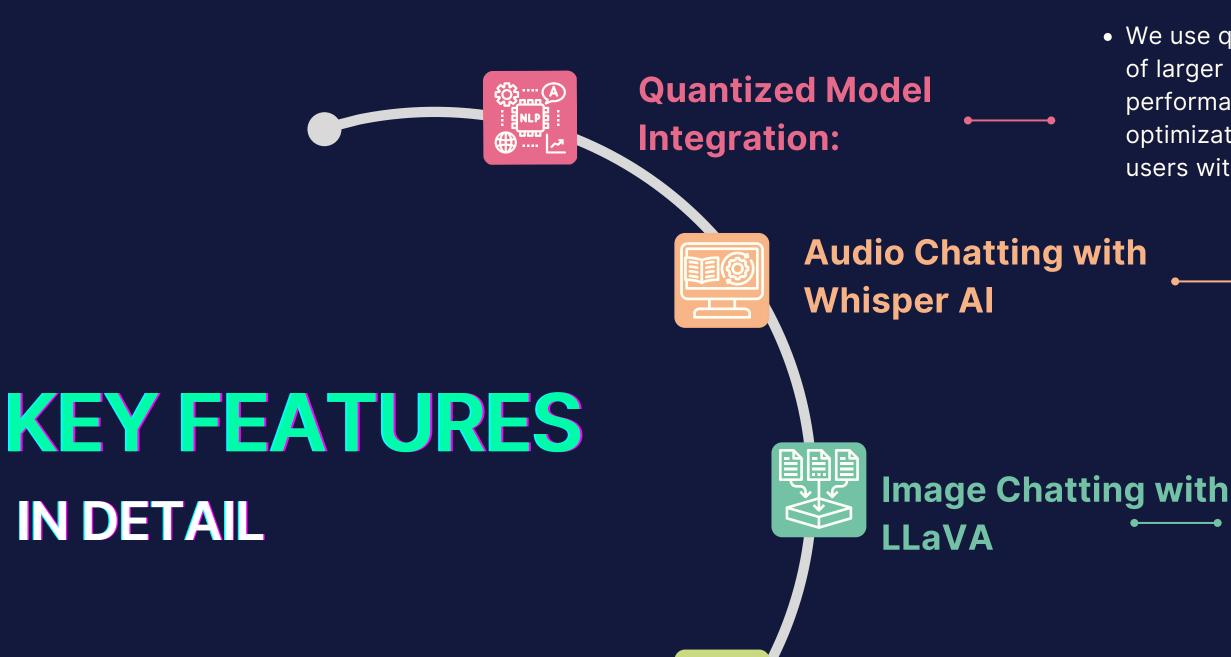
By combining quantized model integration, advanced audio transcription with Whisper AI, image-based chatting using LLaVA, and PDF querying with a custom ITA model, our application offers users unprecedented flexibility in interacting with diverse media formats. Additionally, the utilization of a SQLite database for chat history management ensures continuity and convenience, further enhancing the user experience. This novel approach addresses the growing demand for intuitive and versatile Al-powered applications, setting a new standard for user interaction in the digital landscape.



METHODOLOGY

Our groundbreaking Al-driven app is crafted to offer a flexible and intuitive experience, blending cutting-edge technologies seamlessly. By weaving together various advanced tools, we empower users to engage effortlessly with diverse media formats such as audio, images, and PDFs. Think of our app's README as your go-to guide, providing a thorough walkthrough of our approach, spotlighting standout features, and demystifying how the app operates.





IN DETAIL

• We use quantized models, streamlined versions of larger Al models, to ensure smooth performance on everyday devices. This optimization makes our app accessible to more users without needing top-tier hardware.

> Whisper Al enhances the audio chatting experience by providing robust transcription capabilities. This allows for accurate interpretation and response to voice inputs, facilitating smooth and natural conversations.

• LLaVA, a fine-tuned LLaMA model, enables image-based chatting within the application. It understands image embeddings created using a CLIP model, enabling users to discuss and share visual content seamlessly.

PDF Chatting with Custom ITA Model

• Our custom ITA Chatbot lets users upload PDFs and ask questions, involving data extraction, text cleaning, vectorization, knowledge base storage, and similarity search for precise responses.

SQLite Database for Chat History

We employ a SQLite database to store and manage chat history, ensuring that users can access their past interactions seamlessly. This feature contributes to a seamless and continuous user experience.



In our application, we've combined various features to create a seamless and engaging user experience. Whether you're engaging through audio, images, or PDFs, each mode is designed to enhance your interaction. Behind the scenes, our advanced AI techniques analyze your input, ensuring accurate and relevant responses every time. Plus, our SQLite database keeps track of your chat history, so you can easily revisit past interactions without missing a beat.

Our application doesn't just stop there. We've gone the extra mile by integrating cutting-edge technologies like quantized models, Whisper Al, LLaVA, and a custom-built ITA model for PDFs. These additions cater to a wide range of interaction needs, ensuring that our users have access to the best possible experience.

With these features working together, our application isn't just functional—it's intuitive and user-friendly. So whether you're exploring new content or revisiting old conversations, you can trust that our app will be there to guide you every step of the way.

RESULTS

The chatbot's performance was evaluated on metrics like F1 score, precision, recall, and accuracy, comparing them with benchmarks to gauge its advancement. Evaluation also included testing the chatbot's capability to handle new and diverse data, ranging from simple to complex and ambiguous user queries.



Updated Metrics for singleQA.csv:

Precision : 0.9130434782608695 Recall : 0.3088235294117647 F1-score : 0.46153846153846156

Updated Metrics for PaperChecking.csv:

Updated Metrics for MCQ.csv:

Precision : 0.95

Recall : 0.2235294117647059 F1-score : 0.3619047619047619

Updated Metrics for CourseMaterial.csv:

Precision : 0.8571428571428571

Recall : 0.675

F1-score : 0.7552447552447553

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<u>Literature Review</u>

<u>Github</u>

<u>FIGMA</u>

THANK YOU!

QA [120 SEC]

