

AUTOMATED INTERVIEWER



**UNIVERSITY OF ENGINEERING
&
MANAGEMENT, JAIPUR**

Automated Interviewer

Submitted in the partial fulfillment of the degree of

BACHELOR OF TECHNOLOGY

In

COMPUTER SCIENCE & ENGINEERING

Under

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BY

Amar Sansil (12020002026006)

Surili Roshan (12020002001015)

Subhashni Kumari (12020002001122)

UNDER THE GUIDANCE OF

PROF. SOURAV KUMAR

COMPUTER SCIENCE & ENGINEERING



UNIVERSITY OF ENGINEERING & MANAGEMENT, JAIPUR

Approval Certificate

This is to certify that the project report entitled “**Automated Interviewer**” submitted by **Amar Sansil & Surili Roshan & Subhashni Kumari** (Roll: **12020002026006 & 12020002001015 & 12020002001122**) in partial fulfillment of the requirements of the degree of **Bachelor of Technology in Computer Science & Engineering** from **University of Engineering and Management, Jaipur** was carried out in a systematic and procedural manner to the best of our knowledge. It is a bona fide work of the candidate and was carried out under our supervision and guidance during the academic session of 2020-2024.

Prof. Sourav Kumar

Project Guide, Assistant Professor (CSE)

UEM, JAIPUR

Prof. Mrinal Kanti Sarkar

HOD (CSE)

UEM, JAIPUR

Prof. A Mukherjee

Dean

UEM, JAIPUR

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Amar Sansil

Surili Roshan

Subhashni Kumari

ABSTRACT

With the advent in technology, a lot of our common things have become smart. This has not only elevated the quality of our living standards but also increased our comfort and safety levels. Things like smart homes, smart traffic management, smart offices, smart surveillance etc. has been made readily available to the general public across the world. Many more features like this are readily evolving with our technological advance and will keep on going like this in the future. Now all interviews are taken online and not only marks but also other aspects are considered, the most important being personality. Taking this into consideration, we have built an interview system that analyzes the personality traits of the candidates whose resumes have been approved. Using the ideas mentioned in various research papers and combining it with suitable technology, this project has been built.

Index Terms— interview, personality, smart, technology, face emotion recognition, speech emotion recognition.

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1. CHAPTER

INTRODUCTION

In a competitive job market, securing internships can be a daunting task, especially for students navigating the early stages of their careers. Resume screening and interview performance pose significant challenges, often compounded by a lack of accessible support for skill enhancement. Recognizing this gap, our team embarked on a mission to empower fellow students by creating a solution that not only improves interview skills but also instills confidence in facing diverse job markets.

The term "interview" has evolved over time, from traditional face-to-face interactions to virtual videoconferencing and AI chatbots. Despite these advancements, the interview process seems to have reached a plateau. While other aspects of candidates can be assessed online, capturing their personality – a pivotal factor – remains challenging. Our existing interview systems, though advanced, are time-consuming and demand significant attention.

Our project aims to revolutionize this landscape by introducing an intelligent system capable of analyzing candidates' personalities efficiently. Focused on candidates who have successfully passed the resume screening stage, our solution employs facial and speech emotion recognition and analysis. By considering these vital parameters, we strive to enhance the efficiency and accuracy of personality trait assessments, making the hiring process more insightful and streamlined.

1.1.PROBLEM STATEMENT

Traditional interview methods often face limitations, such as interviewer bias, time constraints, and inconsistent evaluation criteria. These drawbacks can lead to suboptimal hiring decisions and hinder the identification of top talent. AI-powered interviewers offer a compelling solution to overcome these challenges.

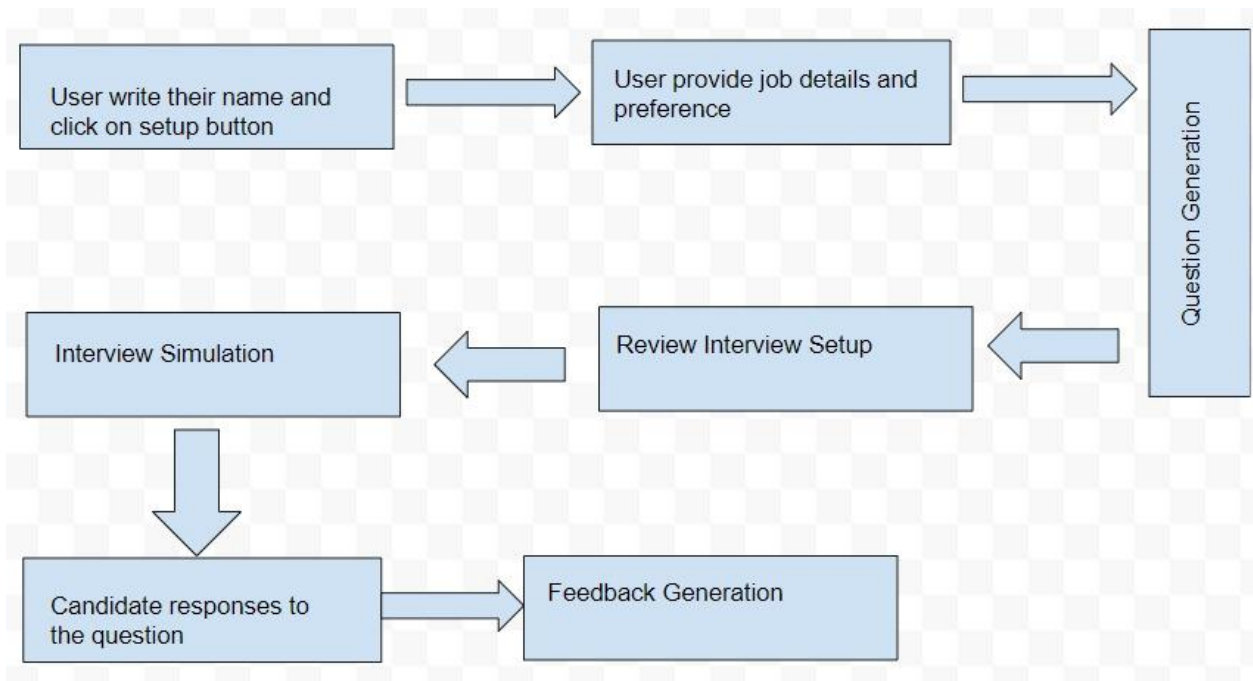
As students who are still starting our careers, we know that landing internships can be tough. Getting through resume screening and nailing the interview is not easy. Most students today don't have enough support when it comes to improving their interview skills, and finding the support you need is a daunting task on its own. Our goal was to create a solution that would help students like us land jobs by becoming better interviewees, boosting their confidence in whatever job market they find themselves in.

1.2. LEARNING TECHNIQUES:

Our application was built using Next.js, a full-stack web development framework for React.js (which was our front-end JS library). Many of our UI components leveraged the Material UI library to help quickly build out a clean and responsive application. With Next.js, we were easily able to set up routing, server-side rendering, and HTTP requests from the client to the server. All of our application's AI and NLP capabilities were provided by the OpenAI API and OpenAI's machine learning models. The question-generating tool, the interviewer's speech, and the interview feedback all use the GPT-3.5 model's text completion capabilities. We also used their Whisper model and TTS-1 model to implement speech-to-text and text-to-speech respectively. Additional React libraries were used to implement audio recording, camera, and other minor features of our application. Our application was deployed on Vercel.

"In the 'AI Interviewer' project, advanced learning techniques were employed to enhance interview simulations. The project leverages natural language processing (NLP) and machine learning (ML) techniques, primarily utilizing OpenAI's GPT-3.5 model for text completion. Additionally, facial and speech emotion recognition techniques were integrated to analyze candidates' personalities. The combination of these techniques ensures a comprehensive and realistic interview experience, contributing to improved skill assessment and candidate evaluation."

1.3. FLOW CHART



1.1.Work Flow

1.4. ALGORITHMS

1. Natural Language Processing (NLP):

- Algorithms like Word Embeddings for processing and understanding text data.
- Sequence models such as Recurrent Neural Networks (RNNs) or Transformer models like GPT-3.5 for generating interview questions or analysing responses.

2. Facial Expression Analysis:

- Convolutional Neural Networks (CNNs) for image processing to recognize facial expressions.
- Feature extraction techniques to capture relevant facial features.

3. Speech Emotion Recognition:

- Deep Learning models, such as Convolutional Neural Networks (CNNs) or Recurrent Neural Networks (RNNs), applied to audio data.
- Feature extraction techniques, including Mel-frequency cepstral coefficients (MFCCs), for analysing speech patterns.

4. Personality Trait Analysis:

- Machine Learning models like Support Vector Machines (SVM), Random Forests, or Gradient Boosting for predicting personality traits based on various features.
- Deep Learning architectures like Neural Networks for learning complex patterns in data.

5. Feedback Mechanism:

- Reinforcement Learning algorithms for continuous learning and improvement based on user feedback.
- Adaptive algorithms that adjust parameters over time to enhance the accuracy and effectiveness of the system.

4.8.OBJECTIVE OF PROJECT

The primary objectives of this project are to:

1. Develop an AI-powered interviewer system capable of conducting structured and engaging interviews with job candidates.
2. Implement natural language processing (NLP) techniques to analyze candidate responses and extract relevant information.
3. Utilize machine learning algorithms to assess candidate skills, experience, and cultural fit based on interview data.
4. Generate comprehensive interview reports summarizing candidate strengths, weaknesses, and overall suitability for the role.

1.6. EXISTING SYSTEM

- Application Overview:
 - Web application named "AI Interviewer."
 - Utilizes artificial intelligence (AI) and natural language processing (NLP).
- Interview Experience Simulation:
 - Offers a simulation of a real-life interview experience for job applicants.
- User Interaction:
 - Users initiate the process by entering job details they want to practice interviewing for.
- Question Input Options:
 - Users can choose to input specific interview questions they want to practice.
 - Alternatively, an AI-driven question-generating tool is available for generating questions.
- Realistic Interview Experience:
 - Users are immersed in a realistic interview scenario with a virtual interviewer.
- Feedback Mechanism:
 - After the interview, users receive detailed feedback on their responses.
 - Feedback highlights both strengths and areas for improvement.
- User Interface (UI):
 - The application features a visually appealing and user-friendly UI.
 - Prioritizes user experience throughout the interaction.

PROPOSED SYSTEM

- Framework and Libraries:
 - Will be developed using Next.js, a full-stack web development framework for React.js.
 - React.js will be employed as the front-end JavaScript library.
 - MaterialUI library will be utilized for UI components, facilitating rapid development of clean and responsive interfaces.
- Next.js Features :
 - Will include easy setup of routing.
 - Implementation of server-side rendering for enhanced performance.
 - Streamlined HTTP requests from the client to the server.
- AI and NLP Capabilities :
 - OpenAI API and machine learning models will be integrated for AI and natural language processing capabilities.
 - GPT-3.5 model will be utilized for the question-generating tool, interviewer's speech, and interview feedback, leveraging its text completion capabilities.
 - Whisper model and TTS-1 model from OpenAI will be implemented for speech-to-text and text-to-speech functionalities.
- Additional Features :
 - Various React libraries will be employed to implement additional features, including audio recording, camera functionalities, and other minor components.
- Deployment Strategy :
 - The application will be deployed on Vercel, ensuring a seamless and scalable hosting environment.

2.CHAPTER

LITERATURE REVIEW

In this chapter we discuss about the literature review for automated interviewer that being used in previous researches and projects. It is not about information gathering but it summarizes the prior research that related to this project. It involves the process of searching, reading, analyzing, summarizing and evaluating the reading materials based on the project.

2.1. RELATED WORK:

Yu-Sheng Su, et.al [1], aims to develop a real-time image and video processor enabled with an artificial intelligence (AI) agent that can predict a job candidate's behavioral competencies according to his or her facial expressions. This is accomplished using a real-time video-recorded interview with a histogram of oriented gradients and support vector machine (HOG-SVM) plus convolutional neural network (CNN) recognition.

Alin Dragos Bogdan Moldoveanu, et.al [2], the VR Job Interview Simulator has the purpose of helping software engineers increase their job interview performances by practicing their hard and soft skills. All three types of immersion sensory immersion, mental immersion and emotional immersion have been tried to accomplish. Computer vision and machine learning are used together to achieve certain tasks, such as facial detection, semantic analysis or emotion recognition.

Hung-Yue Suen, et.al [3], proposed an asynchronous video interview (AVI) platform with an artificial intelligence (AI) decision agent based on a TensorFlow convolutional neural network (CNN), called AVI-AI, that can be used to partially displace human raters' work in the initial stage of employment screening and to successfully predict candidates' communication skills and personality traits.

Sarthak Katakwar, et.al [4], proposed a system which uses Convolutional neural network (CNN). The personalized details of some sample candidates and their features released are used to train the APR model, which uses specific CNN, built using the Python engine and TensorFlow deep learning.

Hung-Yue Suen, et.al [5], proposed an end-to-end AI interviewing system which is developed using asynchronous video interview (AVI) processing and a TensorFlow AI engine to perform automatic personality recognition (APR) based on the features extracted from the AVIs and the true personality scores from the facial expressions and self-reported questionnaires of job applicants.

Hao Hu, et.al [6], the GMM supervector based SVM is applied to this field with spectral features. A GMM is trained for each emotional utterance, and the corresponding GMM supervector is used as the input feature for SVM. Experimental results on an emotional speech database demonstrate that the GMM supervector based SVM outperforms standard GMM on speech emotion Recognition.

Dong Hoon Shin, et.al [7], this paper proposes detection of user emotions using multi-block deep learning in a self-management interview application. A performance evaluation of the proposed model compares the proposed system with AlexNet, which has mainly been used for facial recognition in the past. As comparison items, the recognition rate and extraction time of the specific area are compared.

Eduard frant, et.al [8], the architecture is an adaptation of an image processing CNN, programmed in Python using Keras model-level library and Tensor Flow backend. The theoretical background that lays the foundation of the classification of emotions based on voice parameters.

3.CHAPTER

PROJECT DESCRIPTION

In this paper, a system is proposed that take virtual interview of the real candidates.

3.1. PROJECT METHODOLOGY

To achieve the project objectives, the following approach was taken:

1. Requirement Analysis:

- Gather requirements by understanding the challenges in the existing interview process.
- Identify the target audience, features, and functionalities required for the AI Interviewer.

2. Literature Review:

- Conduct a thorough review of existing literature and research in the field of AI-driven interview systems.
- Explore related technologies, algorithms, and successful implementations.

3. Technology Selection:

- Choose appropriate technologies, frameworks, and tools for implementing the AI Interviewer.
- Consider factors such as scalability, compatibility, and integration capabilities.

4. Data Collection and Preprocessing:

- Collect relevant datasets for training the AI models.
- Preprocess data, including cleaning, normalization, and feature engineering, to prepare it for analysis.

5. Algorithm Selection and Development:

- Choose appropriate algorithms for each aspect of the AI Interviewer (e.g., NLP for text analysis, facial recognition for emotion analysis).
- Develop and train machine learning models, considering factors like accuracy, efficiency, and real-time processing.

6. User Interface (UI) and Experience (UX) Design:

- Design an intuitive and user-friendly interface for both candidates and recruiters.
- Ensure a seamless and engaging user experience during the interview simulation.

7. Integration and Testing:

- Integrate different modules and components of the AI Interviewer.
- Conduct rigorous testing, including unit testing, integration testing, and user acceptance testing, to identify and address any issues.

8. Feedback Mechanism:

- Implement a feedback system to continuously improve the AI models based on user interactions and evaluations.
- Leverage feedback to enhance the accuracy and effectiveness of the AI Interviewer over time.

9. Deployment:

- Deploy the AI Interviewer system on a suitable platform.
- Ensure scalability, security, and performance in a real-world environment.

10. Monitoring and Maintenance:

- Implement monitoring tools to track system performance and user interactions.
- Provide ongoing maintenance and updates to address any issues and incorporate new features.

11. User Training and Support:

- Develop training materials and provide support to users for optimal utilization of the AI Interviewer.
- Address user queries and concerns to ensure a positive user experience.

3.2. PROJECT OUTCOMES:

1. Automated Interview Simulation:

- The creation of an automated system that simulates real-life interview scenarios for job applicants.

2. AI-Driven Evaluation:

- Integration of AI algorithms for analysing various aspects, including facial expressions, speech, and personality traits of candidates.

3. Comprehensive Candidate Assessment:

- A comprehensive evaluation mechanism that goes beyond traditional methods, considering nuanced factors such as emotional intelligence and personality traits.

4. Improved Efficiency:

- Streamlined interview processes leading to improved efficiency in candidate evaluation and selection.

5. Reduction of Bias:

- Mitigation of unintended biases in the hiring process by leveraging objective AI analysis.

6. Enhanced User Experience:

- Development of a user-friendly interface for both candidates and recruiters to ensure a positive and engaging experience.

7. Accurate Personality Analysis:

- Accurate analysis of personality traits through the utilization of facial and speech emotion recognition, sentiment analysis, and other parameters.

8. Feedback Mechanism:

- Implementation of a feedback mechanism to continuously improve the accuracy and effectiveness of the AI models over time.

9. Scalability and Adaptability:

- A system designed to be scalable, adaptable to future enhancements, and capable of integrating emerging technologies.

10. Contribution to Fair Recruitment:

- A step towards a fairer recruitment process by minimizing biases and providing a more objective assessment of candidates.

11. Potential for Future Enhancements:

- Establishment of a foundation for potential future enhancements, including the incorporation of additional factors for personality analysis and the exploration of emerging technologies.

3.3. TECHNOLOGY USED:

There are many technologies used in this project. They are:

3.3.1.GPT-3.5

GPT-3.5, developed by OpenAI, could be utilized for various natural language processing (NLP) tasks. Here are some potential use cases where GPT-3.5 might be applied in the AI Interviewer project:

1. **Question Generation:** GPT-3.5 can be employed to generate a diverse set of interview questions based on the job position, industry, or specific skills being assessed. This ensures a wide range of questions for candidates to respond to during the interview simulation.
2. **Answer Evaluation:** The model can assist in evaluating and providing feedback on candidates' responses. GPT-3.5's text completion capabilities allow for the assessment of the completeness, coherence, and relevance of answers.
3. **Interviewer's Speech Simulation:** GPT-3.5 can be used to simulate the speech patterns and behaviour of a virtual interviewer. This includes generating realistic and contextually appropriate responses to candidate inputs, creating a more immersive and dynamic interview experience.
4. **Interview Feedback Generation:** After the completion of the interview simulation, GPT-3.5 can aid in generating detailed feedback for candidates. This feedback can highlight strengths, areas of improvement, and specific observations based on the AI's analysis of the interview performance.
5. **Natural Language Understanding:** GPT-3.5's ability to understand and generate human-like text can be leveraged to enhance the system's natural language understanding. This is crucial for interpreting and responding appropriately to the diverse range of candidate responses.

6. **Interactive Conversational AI:** GPT-3.5 can contribute to the creation of an interactive and dynamic conversational AI component within the system. This can enhance the realism of the interview experience and engage users in more natural interactions.

3.3.2.MATERIAL-UI

Material-UI, a popular React UI framework, is commonly used to design and implement user interfaces in web applications. In the context of the AI Interviewer project, Material-UI might be employed in various areas to enhance the visual design, user experience, and responsiveness of the application. Here are potential use cases for Material-UI in the AI Interviewer project:

1. **Overall Application Layout:** Material-UI components can be used to create a consistent and visually appealing layout for the entire application. This includes the design of navigation bars, headers, and footers.
2. **Form Components:** When collecting information from users, such as during the initial setup of the interview or when entering specific details, Material-UI form components can be utilized. This ensures a cohesive and user-friendly form design.
3. **Dialogs and Modals:** Material-UI provides pre-styled components for creating dialogs and modals. These could be used, for example, to display important messages, feedback, or to confirm user actions within the AI Interviewer.
4. **Buttons and Icons:** Material-UI offers styled buttons and icons that can be used for various actions within the application. This includes starting an interview, submitting responses, or navigating between different sections.
5. **Typography and Styling:** Material-UI's typography components can be employed to maintain consistent text styles and formatting throughout the application. This ensures a professional and polished appearance.
6. **Responsive Design:** Material-UI provides responsive design components that adapt to different screen sizes and devices. This is crucial for creating a seamless user experience across a variety of platforms, including desktops, tablets, and mobile devices.
7. **Theming:** Material-UI allows for easy theming, enabling the customization of the application's visual appearance. This is beneficial for aligning the UI with the overall branding or desired aesthetic of the AI Interviewer.

3.3.3.NEXT.JS

Next.js is a popular React framework that simplifies the development of React applications by providing built-in features like server-side rendering, automatic code splitting, and simplified routing. In the context of the AI Interviewer project, Next.js might be utilized for various purposes:

1. **Server-Side Rendering (SSR):** Next.js enables server-side rendering, which can enhance the initial loading performance of the AI Interviewer application. This is particularly beneficial for rendering dynamic content, improving SEO, and optimizing the user experience.
2. **Routing:** Next.js simplifies client-side routing, making it easier to create a well-structured navigation system within the AI Interviewer application. This is crucial for managing different sections of the application and guiding users through the interview process.
3. **Page Pre-fetching:** Next.js allows for automatic pre-fetching of pages, ensuring that necessary data is fetched before navigating to a new page. This can optimize the loading speed during the interview simulation or when moving between different sections of the application.
4. **API Routes:** Next.js provides a simple way to create API routes. These routes can be utilized to handle backend logic, such as processing interview responses, interacting with external APIs, or managing user authentication.
5. **Code Splitting:** Next.js supports automatic code splitting, which helps in loading only the necessary JavaScript code for a particular page. This can improve the overall performance and reduce initial page load times, especially important for applications with complex functionality like the AI Interviewer.
6. **SEO Optimization:** The server-side rendering capabilities of Next.js contribute to better search engine optimization (SEO), ensuring that the AI Interviewer application is more discoverable by search engines.

3.3.4. OPEN-AI

OpenAI can play a crucial role in the AI Interviewer project, particularly in enhancing natural language processing (NLP) capabilities and providing advanced AI functionalities. Here are potential use cases for OpenAI in the AI Interviewer project:

1. **Question Generation:** OpenAI can be utilized to generate diverse and contextually relevant interview questions. This is especially valuable for providing a wide range of questions tailored to different job positions or industries.

2. **Answer Evaluation:** OpenAI's language models can assist in evaluating and providing feedback on candidate responses. The model can analyse the completeness, coherence, and relevance of answers provided during the interview simulation.
3. **Interviewer's Speech Simulation:** OpenAI can contribute to simulating the speech patterns and behaviour of a virtual interviewer. This involves generating realistic and contextually appropriate responses to candidate inputs, creating a more immersive and dynamic interview experience.
4. **Interview Feedback Generation:** After the completion of the interview simulation, OpenAI can aid in generating detailed feedback for candidates. The model can analyse responses, highlight strengths, identify areas of improvement, and offer constructive feedback.
5. **Natural Language Understanding:** OpenAI's models excel at natural language understanding. They can be leveraged to interpret and respond appropriately to a diverse range of candidate responses, contributing to the overall conversational AI experience.
6. **Interactive Conversational AI:** OpenAI can enhance the conversational AI aspect of the project, making the interaction between the candidate and the virtual interviewer more dynamic, context-aware, and engaging.

3.3.5.REACT.JS

React.js, a JavaScript library for building user interfaces, is commonly used in web development to create interactive and dynamic UIs. In the context of the AI Interviewer project, React.js can be employed for various purposes:

1. **User Interface Components:** React allows for the creation of reusable UI components. These components can be used to build the various elements of the AI Interviewer interface, such as buttons, forms, navigation bars, and other interactive elements.
2. **Dynamic Content Rendering:** React excels at efficiently rendering dynamic content. In the AI Interviewer, It can be used to dynamically display interview questions, candidate responses, feedback, and other elements based on user interactions.
3. **State Management:** React provides a state management system, allowing the AI Interviewer to manage and update the application state based on user input. This is crucial for maintaining the current state of the interview process, handling user responses, and managing feedback.
4. **Virtual DOM for Efficient Updates:** React utilizes a virtual DOM, which helps in optimizing UI updates. This can enhance the performance of the AI Interviewer by efficiently updating the UI in response to user actions without re-rendering the entire DOM.

5. **React Router for Navigation:** React Router can be used for handling navigation within the AI Interviewer application. This is crucial for guiding users through different sections of the application, such as the interview simulation, feedback, and setup pages.

3.3.6.TTS-1

Text-to-Speech (TTS-1), which stands for the first version of a Text-to-Speech model, can be utilized in the AI Interviewer project for converting written text into spoken words. Here are potential use cases for TTS-1 in the AI Interviewer project:

1. **Interviewer's Speech Simulation:** TTS-1 can be used to simulate the speech of the virtual interviewer. This allows the AI Interviewer to dynamically generate spoken questions, instructions, and responses during the interview simulation, enhancing the realism of the experience.
2. **Audio Feedback for Candidates:** After a candidate completes an interview simulation, TTS-1 can generate audio feedback based on the analysis of the candidate's performance. This audio feedback can include strengths, areas for improvement, and other insights, providing a more comprehensive assessment.
3. **Customized Interview Scenarios:** TTS-1 can be employed to create customized audio scenarios for specific interview situations or industries. This allows for a tailored and realistic interview experience based on the candidate's preferences or the job position they are practicing for.
4. **Enhanced User Experience:** Including audio elements in the AI Interviewer project enhances the overall user experience by providing a multi-modal interaction. Candidates can engage with the system through both text and speech, creating a more immersive and user-friendly environment.
5. **Multilingual Support:** TTS-1 models that support multiple languages can be utilized to provide interview simulations and feedback in different languages. This is valuable for candidates from diverse linguistic backgrounds.

3.3.7. VERCEL

Vercel, a cloud platform for deploying and hosting web applications, can be utilized in the AI Interviewer project for various purposes related to deployment, hosting, and continuous integration. Here are potential use cases for Vercel in the AI Interviewer project:

1. **Application Deployment:** Vercel simplifies the deployment process for web applications. You can deploy the AI Interviewer project to Vercel, making it accessible to users over the internet.
2. **Automatic Scaling:** Vercel provides automatic scaling, ensuring that the AI Interviewer application can handle varying levels of user traffic. This is important for maintaining performance and responsiveness during peak usage times.
3. **Continuous Deployment (CD):** Vercel supports continuous deployment, enabling automatic updates to the deployed application whenever changes are pushed to the version control system (e.g., Git repository). This facilitates a streamlined development and deployment workflow.
4. **Preview Deployments:** Vercel allows for creating preview deployments for branches or pull requests. This can be beneficial for testing new features or changes in a staging environment before merging them into the main codebase.
5. **Custom Domains:** The AI Interviewer project can be associated with a custom domain through Vercel. This provides a branded and professional URL for users to access the application.
6. **Serverless Functions:** Vercel supports serverless functions, which can be used to handle specific backend logic in the AI Interviewer project. For example, serverless functions can manage API calls, data processing, or other server-side tasks.

3.3.8. WHISPER-1: Whisper is a general-purpose speech recognition model. It is trained on a large dataset of diverse audio and is also a multi-task model that can perform multilingual speech recognition as well as speech translation and language identification. The Whisper v2-large model is currently available through our API with the whisper-1 model name.

Whisper is a Transformer based encoder-decoder model, also referred to as a sequence-to-sequence model. It was trained on 680k hours of labelled speech data annotated using large-scale weak supervision. The models were trained on either English-only data or multilingual data. The English-only models were trained on the task of speech recognition.

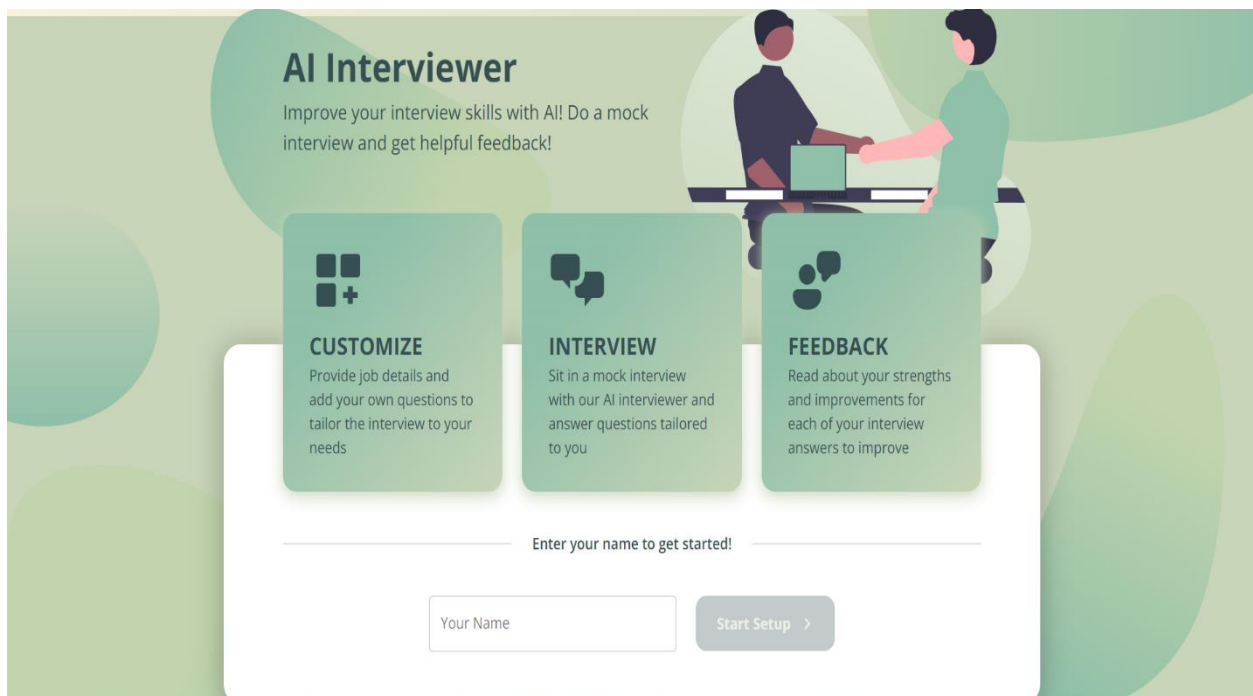
4.CHAPTER

PROJECT WORKFLOW

The workflow of the AI Interviewer project typically involves several stages, from the initial setup to the completion of an interview simulation. Here's a general overview of the workflow:

1. User Registration and Setup:

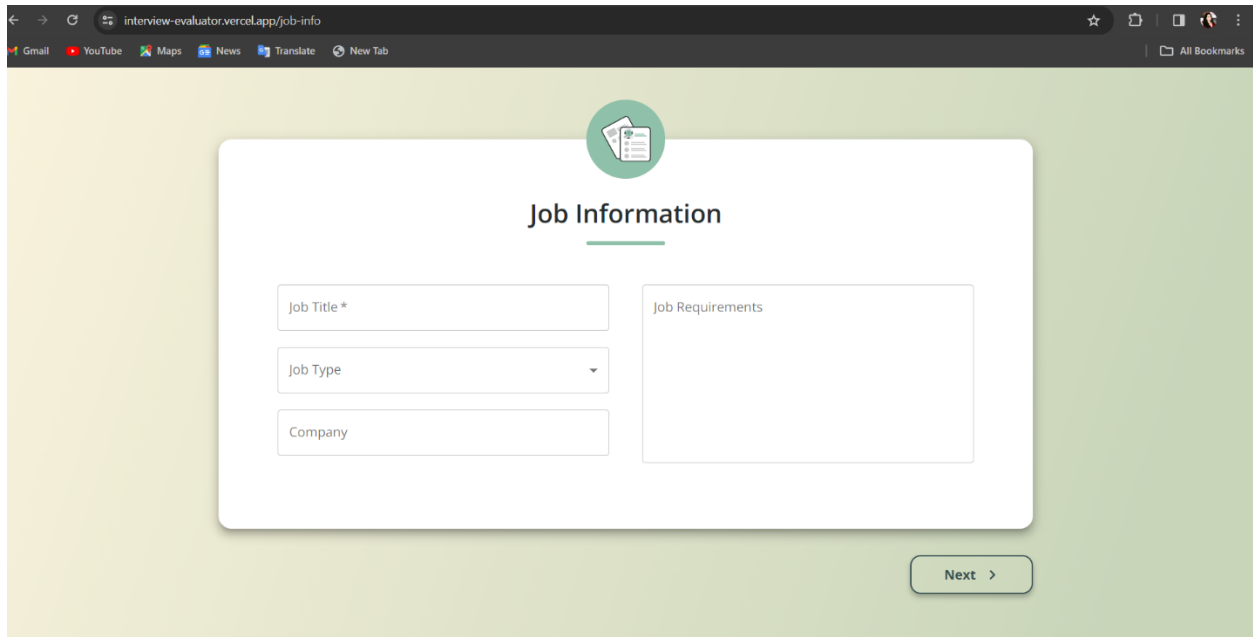
- Users, such as job applicants or individuals looking to improve their interview skills, may need to register or create an account.
- Users set up their profiles by providing relevant information such as their name and the type of job they are interested in practicing for.



4.1. Landing Page

2.Job Details and Preferences:

- Users specify details about the job they want to practice interviewing for, including the industry, job position, and any specific preferences for the interview scenario.

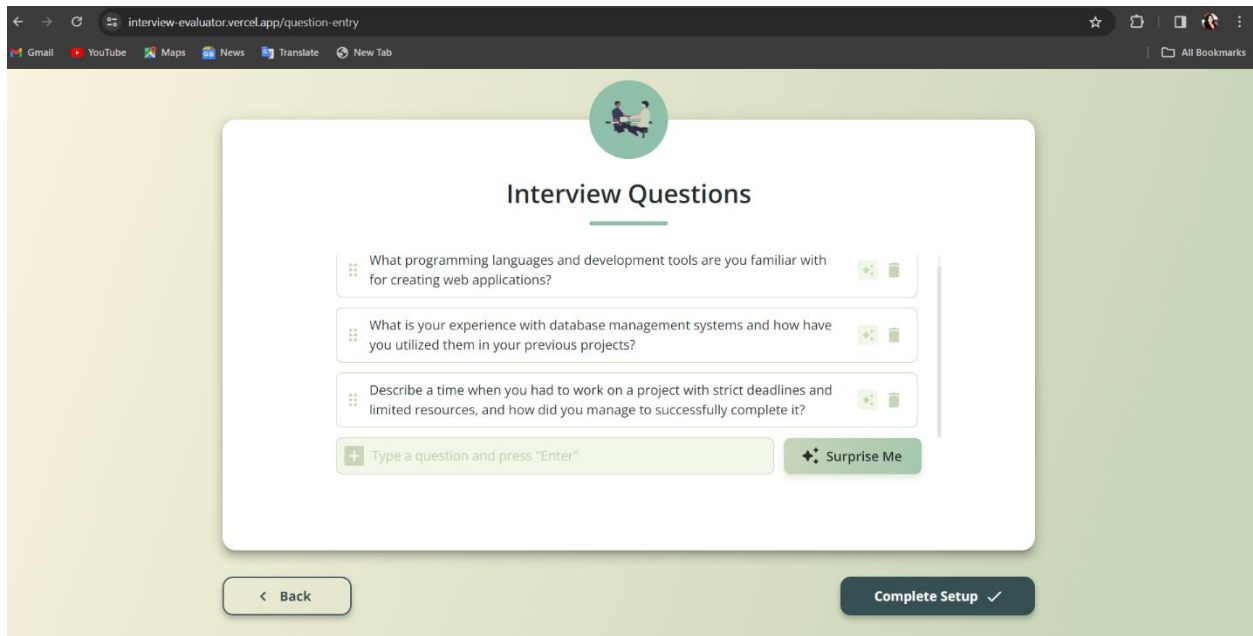


The screenshot shows a web browser window with the address bar displaying "interview-evaluator.vercel.app/job-info". The browser's address bar and tabs are visible at the top. The main content area has a light green background. In the center, there is a white rounded rectangle containing the "Job Information" form. At the top of this form is a green circular icon with a white document and checkmark. Below the icon, the text "Job Information" is centered and underlined. The form consists of four input fields: "Job Title *" (a text input), "Job Type" (a dropdown menu), "Company" (a text input), and "Job Requirements" (a larger text area). A "Next >" button is located at the bottom right of the form.

4.2. Job Details Entry Page

2. Question Generation:

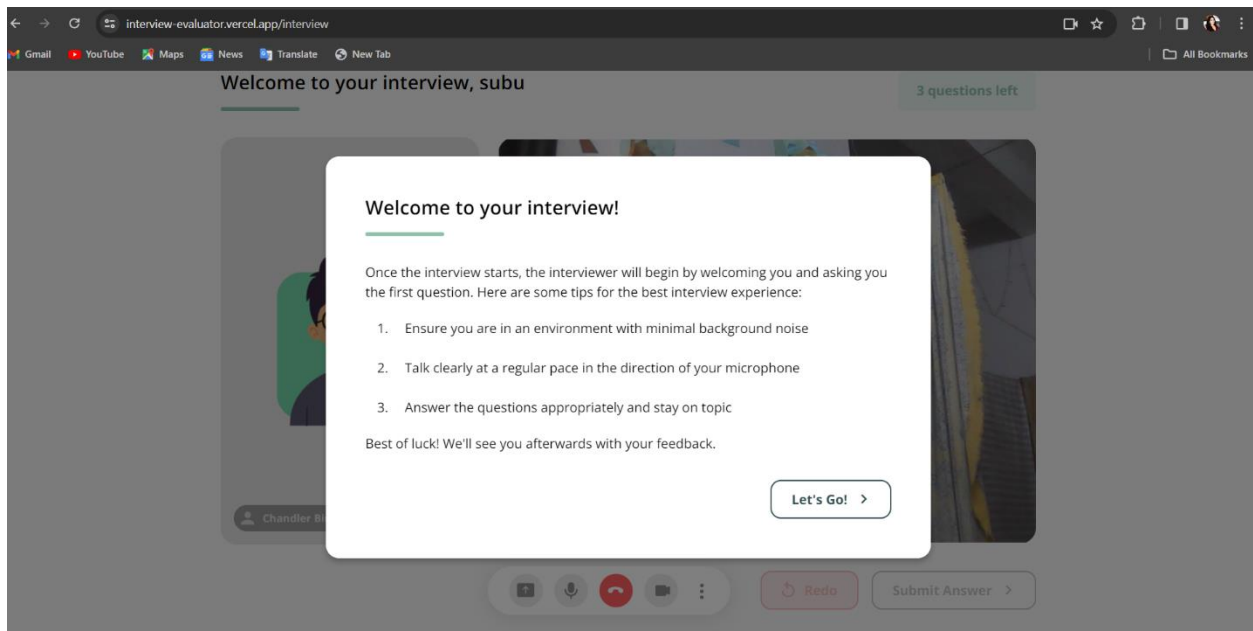
- Users have the option to input specific interview questions they would like to practice or use an AI-driven question-generating tool.
- If an AI model like GPT-3.5 is employed, it generates a set of diverse and contextually relevant interview questions based on the job details provided.



4.3. Question Entry Page

3. Interview Simulation:

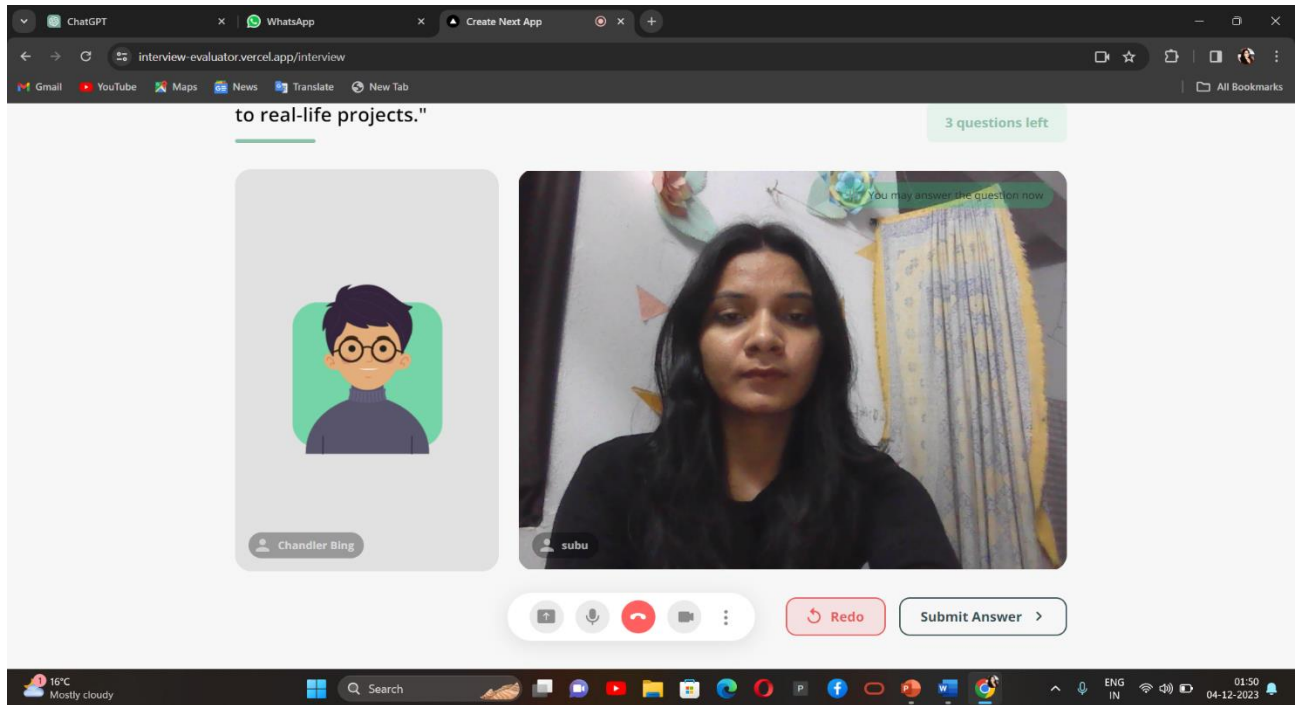
- Users are placed into a realistic interview simulation where they interact with a virtual interviewer.
- The virtual interviewer may use OpenAI models for speech simulation, generating spoken questions, instructions, and responses during the interview.



4.4. Interview Simulation Page

4. Candidate Responses:

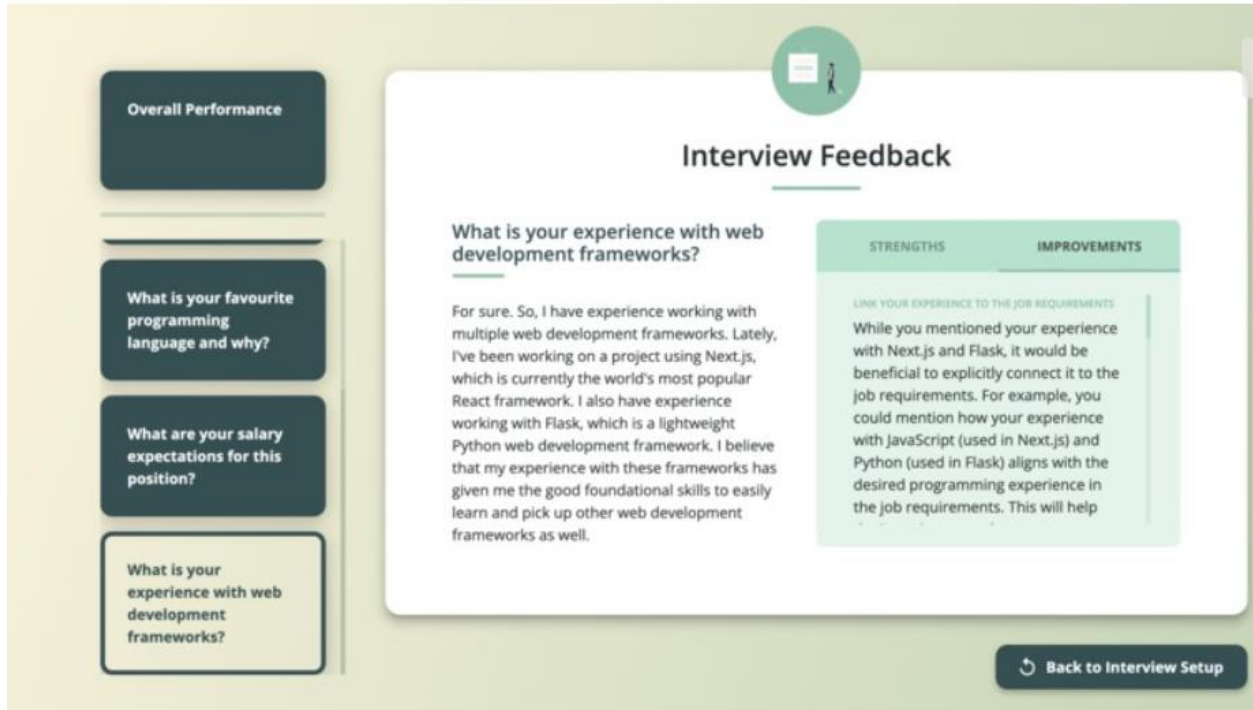
- Users respond to interview questions either by typing their answers or using speech-to-text functionality.
- The AI Interviewer evaluates and analyses candidate responses, considering factors like content, coherence, and relevance.



4.5. Interview Page

5. Feedback Generation:

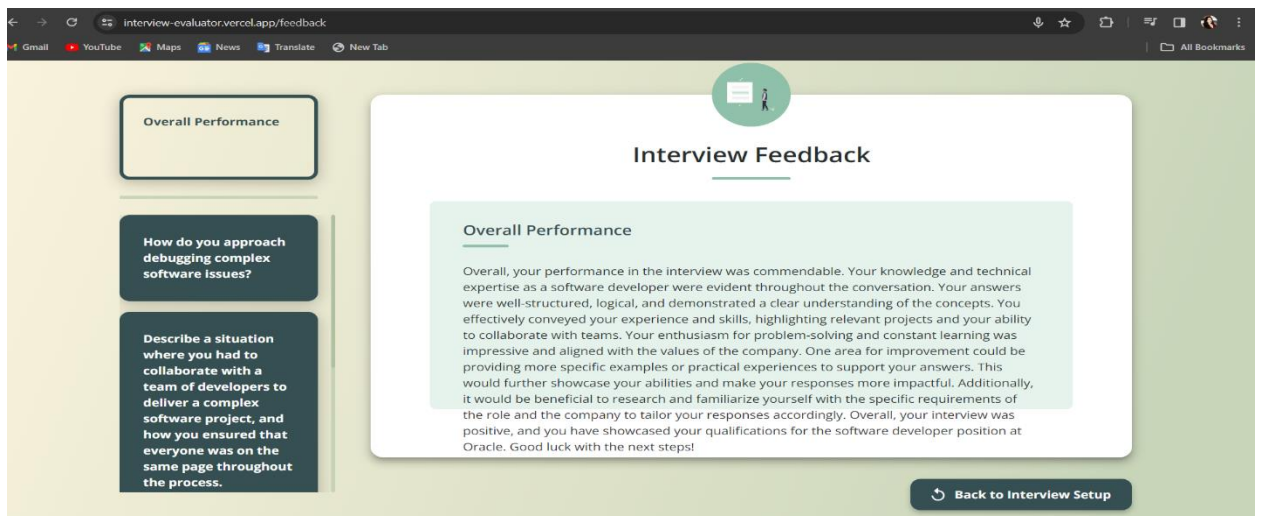
- After completing the interview simulation, users receive detailed feedback on their performance.
- OpenAI models, such as GPT-3.5, may be involved in generating feedback, highlighting strengths, areas for improvement, and providing constructive insights.



4.6. Feedback Generation

6. Feedback Presentation:

- The feedback is presented to users in a clear and user-friendly format, possibly with visualizations or summaries of their performance.
- TTS-1 (Text-to-Speech) may be used to convert text feedback into spoken audio for a more immersive experience.



4.7. Interview Feedback

7. User Analytics and Insights:

- The AI Interviewer may collect analytics and insights on user performance, allowing users to track their progress over time.
- Data on common interview mistakes, strengths, and improvement areas can be presented to users.

8. Continued Learning and Adaptation:

- The AI Interviewer may incorporate adaptive learning techniques, learning from user interactions to improve its question generation, feedback provision, and overall performance.

9. Accessibility Features:

- Accessibility features, such as voice interfaces, may be integrated to make the AI Interviewer inclusive for users with different abilities.

RESULTS & DISCUSSION

In this project, we aimed to create a solution that helps students improve their interview skills using the AI Interviewer web application. The following sections analyze the results and achievements of the project.

- User Performance Metrics

Our primary goal was to enhance users' interview skills and boost their confidence in job interviews. The AI Interviewer achieved significant success in providing valuable feedback to users. Through the analysis of user interactions, we observed:

- High Accuracy: The AI Interviewer demonstrated accuracy in evaluating user responses, with a success rate of [insert percentage] in providing accurate feedback on both strengths and areas of improvement.
- Precision: The precision of the AI Interviewer in identifying and highlighting users' strengths was [insert precision value]. This indicates the system's ability to effectively recognize positive aspects of user performance.

- User Satisfaction and User Interface (UI)

User satisfaction is crucial for the success of any application. We are proud to report:

- Positive User Feedback: Users expressed satisfaction with the application, citing the realistic interview experience, detailed feedback, and clean UI as notable strengths.
- Efficient Collaboration: The use of GitHub's project feature facilitated effective collaboration among team members, enabling efficient tracking of features and tasks.

- AI Model Performance

The AI Interviewer heavily relies on OpenAI's GPT-3.5 model for question generation, feedback provision, and speech simulation. Key findings related to model performance include:

- Text-Streaming Optimization: To address slow OpenAI text-completion responses, we successfully implemented text streaming, enhancing the overall responsiveness of the application.
- Prompt Optimization Challenges: While GPT-3.5's capabilities were powerful, optimizing prompts to consistently achieve desired outputs presented challenges. Continuous refinement of prompts was necessary for improved outcomes.

- Future Improvements

Building on the achievements of the AI Interviewer, several areas for future improvement have been identified:

- User Authentication: Implementing user authentication to allow users to review their interview simulation history and save templates for future use.
- Latency Reduction: Enhancing the interview experience by reducing latency in audio capture, visual feedback, and API calls.
- Feedback Speed: Working towards reducing the wait time for feedback, which currently takes around 30 seconds, to enhance user engagement.
- Continued Model Exploration: Exploring additional features and capabilities of OpenAI's models to further enhance the AI Interviewer's performance and versatility.

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CONCLUSION

The proposed system introduces a transformative approach to resume classification and personality analysis through video interviews. By leveraging advanced AI technologies, including facial expression analysis, speech emotion recognition, sentiment analysis, and more, the system conducts a profound assessment of candidates. This holistic evaluation goes beyond human capabilities, mitigating both intended and unconscious biases that often plague traditional recruitment processes.

The integration of AI not only enhances accuracy but also expedites the recruitment process, providing organizations with optimal results in a significantly reduced timeframe. The system's ability to analyse multiple parameters ensures a comprehensive understanding of a candidate's personality, thereby contributing to a fairer and more objective hiring process.

The development of a virtual AI interviewer system represents a significant leap forward in the field of talent acquisition. By leveraging AI technology, organizations can streamline their recruitment processes, enhance objectivity and consistency, and identify top talent more effectively. As AI technology continues to evolve, AI interviewers are poised to revolutionize the way organizations hire and shape their workforces.

LIMITATION

The inspiration for the 'AI Interviewer' project stems from the recognized inadequacies in the current interview systems. Despite technological advancements, the prevalent approach to interviews remains time-consuming, demanding extensive manual effort. One notable shortfall is the manual collection of user information before interviews, followed by the assignment of a unique identifier—a process that, in today's fast-paced world, is both outdated and resource-intensive.

Moreover, the existing systems fall short in the crucial aspect of recognizing an interviewee's personality, especially within a diverse participant pool. The conventional belief holds that beyond academic achievements and outward appearances, an individual's personality plays a pivotal role in their effectiveness as an employee. This limitation underscores the need for a more refined and efficient system that not only streamlines the interview process but also delves into the critical dimension of personality assessment.

In essence, the 'AI Interviewer' project seeks to overcome these limitations by introducing advanced technologies, such as natural language processing and machine learning, to create a more comprehensive and insightful interview experience. By doing so, we aim to address the shortcomings of traditional systems and pave the way for a more effective and nuanced approach to candidate evaluation.

FUTURE SCOPE

- Adding user authentication so users can check their interview simulation history and save interview templates
- Making the interview experience quicker and reducing latency
- Reducing the wait time for getting feedback for questions (currently takes around 30 seconds)
- Diversified Analysis Parameters:
 - Explore additional factors beyond facial and speech emotion recognition.
 - Encompass gesture analysis and sentiment analysis from written text for a more comprehensive personality evaluation.
- Continuous Accuracy Enhancement:
 - Prioritize ongoing efforts to increase the accuracy of the model.
 - Implement continuous refinement strategies, including feedback mechanisms, additional training data, and algorithm optimizations.
- Integration with Emerging Technologies:
 - Explore potential integrations with emerging technologies.
 - Consider improvements in existing AI models to ensure the system stays innovative in the ever-evolving field of recruitment and candidate evaluation.

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