

AI Interview Preparation System

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Abstract: The AI interview preparation system is a tool that uses automated evaluation and customized feedback to assist users in preparing for interviews. The system uses speech processing, keyword-based analysis, and LLM Modules to mimic interviewers. It creates questionnaires according to the domain and degree of difficulty chosen by the user. Similarity matching and scoring methods were used to assess the responses. Comments on accuracy, assurance, and clarity to assess communication effectiveness and speech input were also examined. It reduces the need for conventional interviewing techniques and gives users the opportunity to improve their performance through tracking and feedback mechanisms.

Keywords: Ai mock interview, LLM, Speech analysis

I. INTRODUCTION

The AI interview preparation system is a program designed to help users prepare for interviews using personalized feedback and automated assessment. The system uses speech processing, keyword-based analysis, and LLM modules to mimic the interviewers. Creates questionnaires according to the domain and degree of difficulty chosen by the user. Similarity matching and scoring methods were used to assess the responses. Comments on accuracy, assurance, and clarity were used to assess communication effectiveness, and speech input was also examined. It reduces the need for conventional interviewing techniques and gives users the opportunity to improve their performance through tracking and feedback mechanisms.

Smart Prep, which is powered by OpenAI ChatGPT and has speech and text capabilities, gives users a useful and virtual practice environment to enhance their interview performance. Smart Prep which was developed using Svelte for the front end and Flask for the back end, shows great promise as a useful training tool in both professional and educational contexts.

Conventional interview preparation techniques, such as rehearsing with friends or participating in mock interviews, are often inadequate for assessing an individual's performance and delivering timely feedback. The user first chooses their area of interest, talents, and interview difficulty level.

II. LITERATURE REVIEW

The advancement of artificial intelligence has significantly impacted the development of current interview preparation websites. According to the existing literature, current intelligent interviewers use sophisticated machine learning algorithms, specifically BERT and GPT transformer architectures, to generate appropriate questions and analyze answers provided by users. Such tools have been designed to judge the performance of applicants based on their language usage and other similar skills. However, the measurement of soft skills and the problem of bias remain critical issues (Patel et al., 2022).

Another trend identified by research includes the need for speech and emotion analysis in the interview process. Deep learning approaches, such as convolutional and recurrent neural networks, are often

used to conduct research related to voice characteristics, such as tone and pitch. It is possible to assess the candidate's level of confidence and communication skills. Nevertheless, despite their usefulness, the efficiency of these models greatly depends on the dataset quality (Kumar & Zhang, 2020). Additionally, visual analysis has gained importance in the interview assessment process in recent years. Computer vision methods are applied to interpret facial expressions, hand gestures, and other forms of body language to provide a more holistic analysis of a candidate's behavior. This offers greater knowledge about the assessment process; however, issues concerning user privacy have also emerged as a consequence. To ensure an increase in the belief in the implementation of artificial intelligence, researchers are increasingly relying on methods such as SHAP and LIME (Jones & Patel, 2022). A crucial component, as discussed in various studies on AI-assisted evaluation, is fairness in the process. AI systems based on biased or limited data may lead to unfair and inconsistent outcomes; to handle this issue, skilled individuals have recommended the use of balanced data along with bias reduction techniques for a fair evaluation of all users. Another useful method is the use of multimodal data (Wang et al., 2021).

In conclusion, the next step for AI interview systems is to become even more adaptive, scalable, and timely. With the incorporation of technologies such as natural language processing, voice analysis, and facial recognition, the goal of creating realistic interviews with meaningful feedback is achieved. However, certain difficulties linked to ethical issues and bias should be addressed. These issues will be solved by the suggested approach, which incorporates structure, automation, and performance assessment into the interview process.

II. METHODOLOGY

The system used for training underwent a systematic process flow to effectively simulate scenarios and evaluate user performance during interviews. First, the

user was given permission to log into the system and make their choice based on the type of domain or skill sets the difficulty level they would like. This information will be used to create an interview question list for the user using the advice of a Large Language Model. The user is expected to respond in the form of text or speech. In case a voice response is provided, then transcribe it to text with the help of the speech-to-text component of the system.

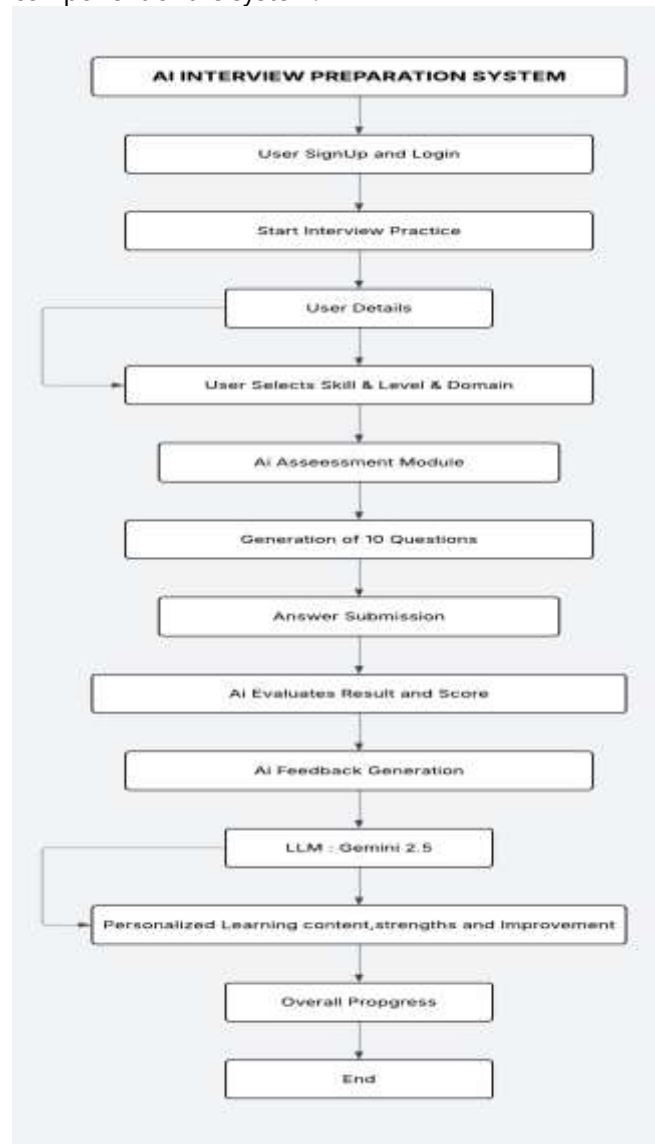


Fig 1 : Flow chart

The workflow of the AI interview preparation system is depicted in this figure. The interview practice begins after the user registers and logs in. The user enters the information about their domain requirement and level, and skill. Then, the AI assessment module creates questions, gathers responses, assesses performance and deliver feedback. Finally, it provides tailored learning materials, identifies areas of strength and growth, monitors overall development, and wraps up the procedure.

Generally, the process of completing these steps always follows an organized order, namely: logging in, choosing a subject area and difficulty level, fetching the questions, providing the answers, evaluating them using AI algorithms, receiving feedback, saving session information, and tracking performance statistics. Thus, scalability and efficiency are guaranteed in this study.

III. IMPLEMENTATION

In the software implementation of the planned AI-controlled trial interview platform, a modular full-stack architectural design will be adopted to guarantee efficient processing and scalability. The front end of the system will be designed to allow users to register, log in, choose their domains, skills, and levels, and participate in mock interviews. The backend handles all functions in the system, such as request processing, conducting mock interviews, evaluating the user's answers, and providing feedback.

The AI interview preparation system utilizes an LLM called Gemini to generate dynamic interview questions for the user. After the user provides an answer to the question via text or voice input, the response is evaluated. For voice input, the text form of the user's response is generated using speech-to-text conversion tools. The testing procedure will use methods that are keyword matching and similarity to assess the user's answer against the expected answers, after which scores will be given and feedback will be provided based on the outcome of the evaluation.

For the backend, technology stacks such as Node.js and Express can be considered for developing APIs that

transfer information between the front-end and processing components. Databases such as MongoDB will be deployed to store user data, interview records, and performance metrics. Also it contains safety measures that may guarantee authentication and user session management. With its modular architecture, new functionalities such as progress trackers can be easily added.

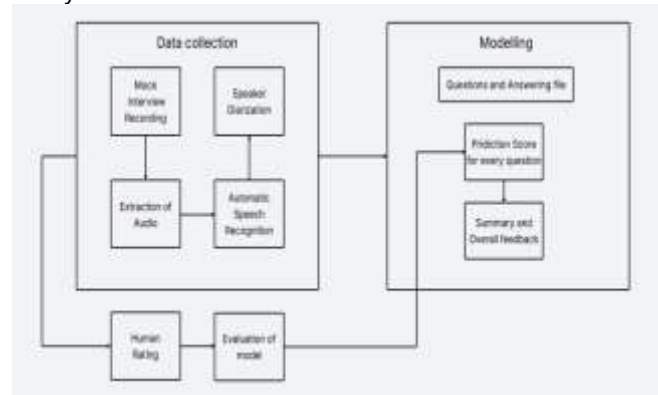


Fig2:Block diagram

Collecting information and predicting are important stages in the AI interview preparation system, as shown in the diagram. Speaker diarization occurs during the data analysis phase to identify speakers using audio interviews. Automatic speech recognition converts audio into text. To further enhance the model accuracy, human ratings were collected as reference evaluations. The process inquiries and answers are placed in the system for modelling. For each reply, the model provides prediction scores based on the relevance and quality. Finally, it provides an outline and overall performance feedback. To ensure reliability and efficiency in the interview testing, the system was tested using human ratings.

IV. AND DISCUSSIONS

Various scenarios were used to test the system, including varying levels of difficulty and types of inputs. It has been noted that answers with correct concepts and keywords obtained higher marks, whereas partially correct answers earned moderate marks. Irrelevant

answers received low marks. The speech-to-text software performed very well under normal situations; however, when noise was present in the background, code transformation was difficult. The system produced feedback consistently, which assisted users in identifying areas to work on. Furthermore, the system recorded the performance data of the users.

1. Login page

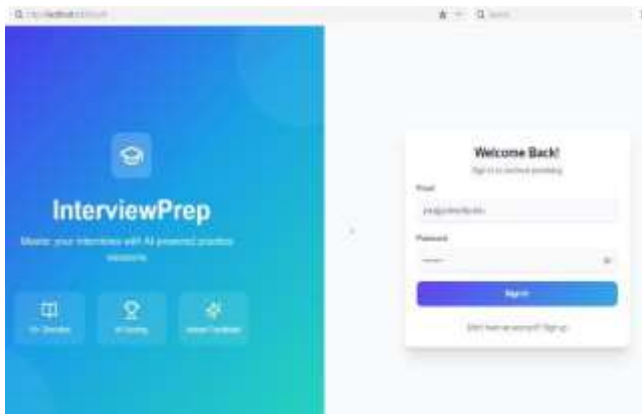


Fig 3 : login page

The image displays an advanced login page with a smooth blue-to-teal gradient background for the InterviewPrep website. The right side features a straightforward sign-in form with email and password fields, while the left side emphasizes the platform's benefits with messages about AI- powered practice sessions. The layout, which is useful for students or job seekers preparing for interviews, is simple, professional, and easy to use. A bold "Sign In" button stands out.

2. Dashboard

The picture displays the customized dashboard with a cordial greeting to welcome the user back. It shows an important data, including the number of sessions completed, average score, and most recent practice activity. While the other elements, such as score trends and recent sessions, assist users in tracking their progress, a prominent "Start Practice" button promotes instant engagement. The application's dashboard,

practice, history, and all profiles are viewed in a sidebar navigation menu on the left side.



Fig 4 : dashboard

3. Interface page

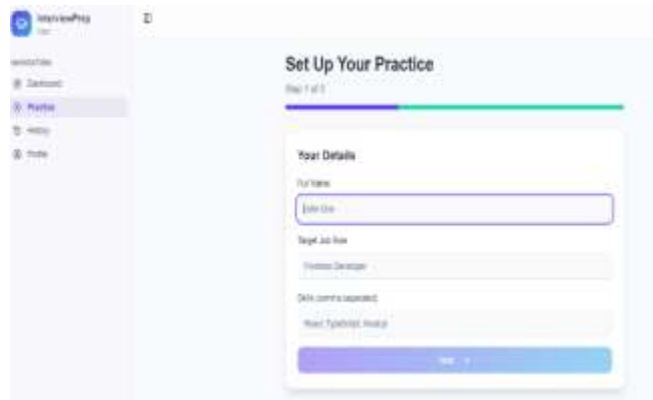


Fig 5 : interface page to guide users

An organized setup page for beginning a new practice session is displayed in the image. The user is guided throughout the process using a progress indicator that displays step 1 to 3. To ensure a customized experience, the form gathers a crucial information, including the full name, target job title, and pertinent skills. Distractions were minimized, and the setup was simplified by the design's continued concentration and cleanliness. Users can easily proceed to the next stage of the workflow by clicking the "Next" button at the bottom.

4. Level Selection

The user chooses a difficult level on this page, which displays the second step of creating a practice session in InterviewPrep. To assist the user, three options—Easy, Medium, and Hard—are provided, each with distinct visual icons and descriptions. A balanced challenge is indicated by the selection of a medium level. The user can go back or move on to the next phase using the navigation buttons, and the progress indicator at the top indicates that the setup is only partially complete.

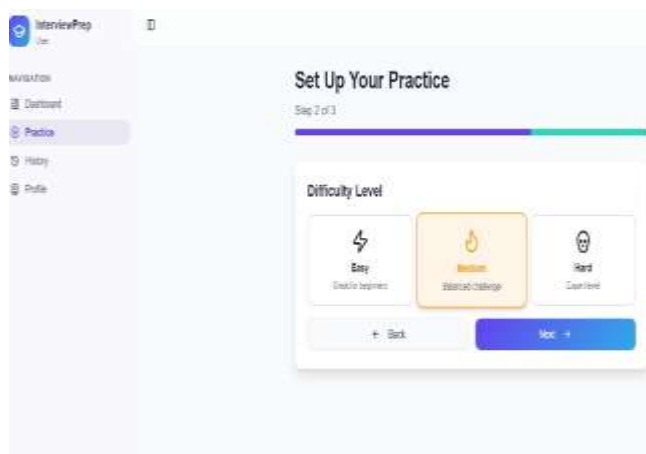


Fig 6 : selection of level for users

5. Language Selection

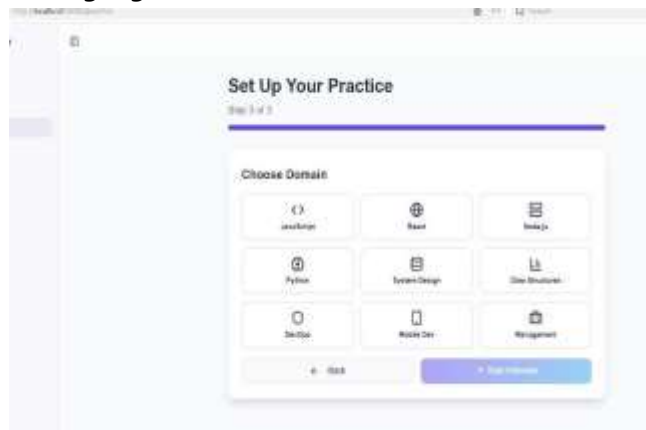


Fig 7 : language setup

In the last phase, the user is required to select a domain for their interview practice. Numerous alternatives, including JavaScript, React, Node.js, Python, System Design, Data Structures, DevOps, Mobile Development, and Management, are displayed on the interface. For ease of recognition, each option was represented by an icon. The "Start Interview" button is clearly marked to start the session, and the progress bar is completely filled, indicating that the setup stages have been completed.

6. Question Generation

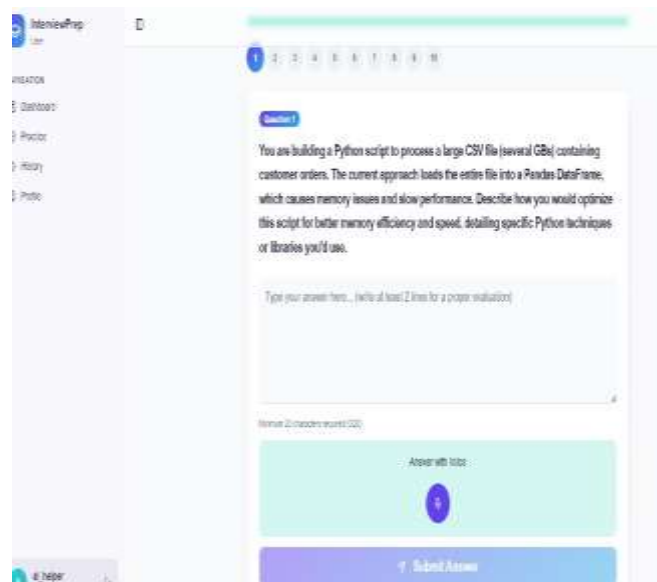


Fig 8 : Question generation

The above figure shows an illustration of the question, and how the problem statement on optimization of a Python code for dealing with large CSV files was stated, in the interview setup as seen from the screen below. There is also a text box that can accommodate the answer, as well as some instructions concerning the minimum number of characters that should be used in answering. A voice input feature has also been included as a way of improving usability.

7. AI Feedback

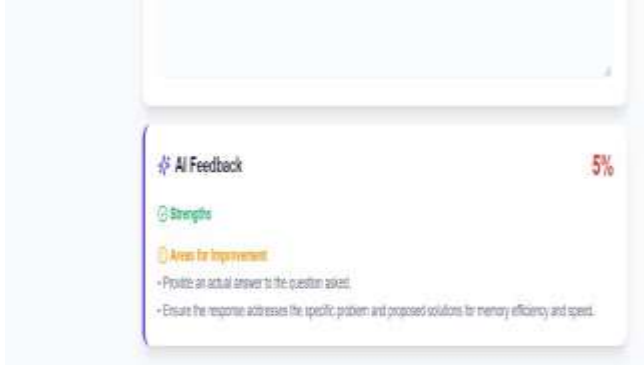


Fig 9 : Ai feedback for single question

The feedback page generated by the system, which has an extremely low score, draws attention to the performance of the user. The emphasis is not on the user's strong points but on the areas where he lacks; hence, it seems like the output provided does not match the topic and misses many significant aspects like speed and memory management.

8. Overall Feedback

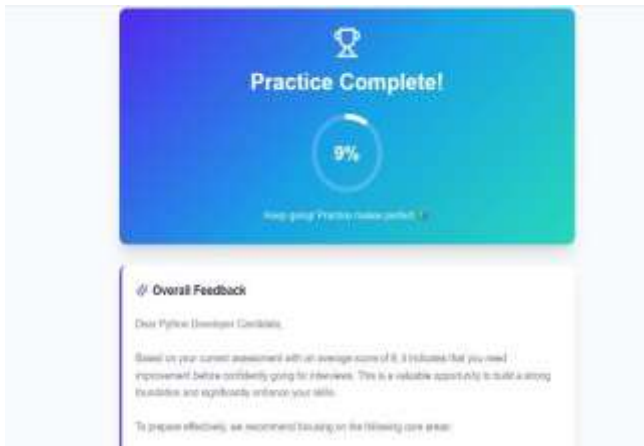


Fig 10 : final feedback

The above picture is that of an AI-based interviewpreparation software following the practice session. As seen from the status bar, the user is still on the previous learning page and therefore much needs to be done. The "Continue! Practice makes perfect" statement is aimed at encouraging the user to continue

practicing as it takes persistent effort to become better. The above visual provides a total review of feedback provided. This implies that the average nine-point score means that the user needs much more preparation before attending any interviews. Such kind of feedback encourages users to hone their problem- solving skills as well as revising key concepts.

V. CONCLUSION

The proposed AI Interview Preparation System provides a very effective means of improving the user's interviewing skills through automatic assessments and personalized suggestions. Considering the ways the suggested system employs question generation from LLMs, as well as keyword matching and similarities, one can say that accurate assessments will definitely be provided. Besides, the opportunity of working with voice inputs ensures higher engagement and helps users develop their speaking skills. Therefore, the discussed system appears highly scalable and user-friendly.

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