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Prep AI - Customized Mock Interview Platform Using Gen AI

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Abstract: In the modern competitive labor market, preparedness during interviews has become critical towards gaining employment. The current paper introduces a project Prep AI. A Customized Mock Interview Platform Using Generative AI, an intelligent web-based application that strives to provide students and job applicants with the simulated experience of a personal interview. According to the system, resume-based and role-based mock interview modes are combined to answer dynamic questions with large language models (LLM) like LLaMA 3 through Groq API. Communication is conducted in real time by the voice reaction, which is recorded with the help of WebRTC and analyzed with speech recognition and facial recognition. The platform is created using Flask and React TypeScript and has been integrated with NLP, computer vision, and emotion recognition to evaluate communication skills, grammar, and confidence. The paper shows how AI-based scoring and feedback has the potential to enhance the performance of the user and resolve the discrepancy between training and a real-life interview.

Keywords: *AI Mock Interview, Generative AI, Natural Language Processing, Flask, LLaMA, WebRTC.*

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I. INTRODUCTION

Under the digital transformation, "Artificial Intelligence (AI)" has transformed the world in several areas and sectors where it was executed including education and recruitment and in professional training. The traditional methods of interview preparation, e.g., several canned questions, or even training in coaching are not conducted in the out-of-the-box and customized look of a genuine interview.

After creating the "Natural Language Processing (NLP)", "Speech Recognition" and "Computer Vision", now, the effect of real interview, when the applicant must be checked on the technical knowledge, along with the skills of communication, is possible. Generative AI models include the Large Language Models (LLM) (such as LLaMA, GPT-related, etc.), which are capable of creating human-like as well as context-related questions and feedback.

These technologies, in combination with the AI-based mock interviewing can be employed to provide the more objective result on the preparedness of the candidate becoming aware of themselves and increasing performance in the long-run.

Students and job seekers also complain of anxiety during interviews, a lack of individualized feedback, and exposure to realistic interviewing conditions. The current online transactions only offer textual questions and uninteractive assessments, which are not representative of a real interaction.

This work is motivated by the desire to produce a simulation system of an interview that uses artificial intelligence to simulate an actual interview events taking place. These are dynamic question generation, voice recognition, feature analysis and performance and feedback.

In this way, the platform will democratic access to professional interview practice and allow users to get better through repeated and data-driven sessions.

II. LITERATURE SURVEY

Many research studies includes the work of Artifical intelligence[AI] for developing mock interview platform.

Smith and Brown (2021) proposed an *AI Powered Mock Interview Platform* that used virtual simulation technologies for interviews preparation, user interaction. This platform

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also provides feedback to users based on the "user's interview and the main issue is", it faced limitation due to security issues.

Dr. Prakash and Siranjeevi (2024) made *Next Interview*, which reviews existing AI-based solutions and highlights AI-based personalization and personalized feedback for interviewer's improvement.

Shubin Yu (2025) presented *An AI Powered Interview platform: MimiTalk*, evaluates AI vs Human based interview and discusses about future research about automated interview using Large Language Models (LLM's).

All research work describes about the AI future enhancement and improvements regarded automated interview and personalized feedback using Large Language Models and other AI models. It needs further research using Generative AI specially LLaMA models.

III. PROBLEM STATEMENT

A. Some of Weaknesses of Existing Mock Interview Systems are:

Lack of Personalization: Most of the systems are not personalized with regards to resumes and job positions of the user. Low Feedback quality Evaluation is often generic and does not go too much into analyzing the tone, communication and confidence. Absence of Multimodal Feeds: The platforms available are not very frequent in including the speech and facial feedback in the process of the assessments. Lack of Real-Time Communication: delays in answering and clearance of assessment infringes with incumbence of a face-to-face interview. To eliminate these limitations, this research will propose a Multimodal Generative AI Framework, that is a combination of NLP, Speech Recognition and Computer Vision to have a continuous real time interview.

IV. OBJECTIVE

A. The "Primary Objectives" of this Research are:

To develop a interview platform that supports both resume and role based mock interviews. To improve the platform's performs by generating context based questions using generative model especially using Llama 3. To evaluate face emotions and evaluating user answers in real time which also includes speech recognition and text transformation. Generate feedback using user real time face emotion analysis to increase the capability of individual user in expressing their views correctly through their face. To build a user-friendly interface that helps users to interact easily and evaluate their progress. To track user performance over multiple mock interview sessions and provide personalized recommendations for improvement based on historical data. To simulate real-world interview scenarios using AI-driven role-specific questioning and multimodal interaction to enhance user preparedness and confidence.

V. PROPOSED SYSTEM

The one that is offered is PREP AI which is a multimodal intelligent mock interview platform operating on the basis of the Generative AI and the Natural Language Processing (NLP). It anticipates providing it with interactive and personalized interview experience, which will be tailored to the background and resume of target candidate and the job position. The system bridges the gap between traditional and formalized interviews, which are the conventional forms of interview, and the reality of the real-life interview with the assistance of AI-powered question generation, voice recognition, and analytics of the feedback.

B. Smart Question Generating

The system uses interactive interview questions that are dynamically generated with Generative AI models (including GPT-based architecture) that is specially configured to: The abilities, experience, undertakings, schooling of the user. The position or the company that is selected. The interview- based one (Technical / HR).This has been so to make each interview unique, industry situation and industry anticipation.

C. Multimodal Interview Interaction

Using PREP AI, voice-based services and interaction is possible as compared to the existing systems of text- only interaction, which is supported by the WebRTC and Speech Recognition tools. A speech synthesis questions interviewer (AI). The candidate interview is conducted verbally and this is simulated as an actual interview. Such a multimodal system enhances the degree of realism and helps users to elevate the degrees of verbal communication, confidence, and fluency.

D. Analysis of My Response and Feedback in Real-Time

The speech-to-text conversion converts the audio feedback provided by the candidate into text that is analyzed by referring to NLP. Appropriateness and correctness of the information. Grammar and vocabulary Articulateness and confidence of speech. Emotionality and atmosphere. On the basis of this, the system will provide real-time feedback and quantitative score of the performance that will enable the users to track down on what they need to improve.

E. Monitoring the Interpretations of Interview

The system stores a record of performance of every user, which includes the feedback and the scores that are achieved with different sessions. Learning throughout life and skills observation. Preparation of growth reports, analytics dashboard that shows the growth patterns.

F. Resume and Role Integration

PREP AI It is an algorithm that transforms an uploaded resume of the user into the necessary keywords, skills and some project details, obtained by extracting information and analyzing the data using semantics. Depersonalize the interview questions depending on the experience of the user. Fargo pose mannerisms of actual corporations interview pattern depending on the field of the candidate.

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G. Individualization and Custom Learning

The system is refined by a feedback mechanism that relies on machine learning: Question difficulty level. Evaluation accuracy. Individualization of feedback based on previous-session. This will ensure that interview will evolve as the degree of skills and preparation will build in the candidate.

H. User-Friendly Web Interface

The system is deployed as a web platform using a costume of Flask / Streamlit on its front end and connection to FastAPI or Flask on the back end. It provides: User registration and log in of fluid. Interview role and type can be selected easily to be used. Live interviewing control board with stream audio and transcript.

VI. SYSTEM ARCHITECTURE

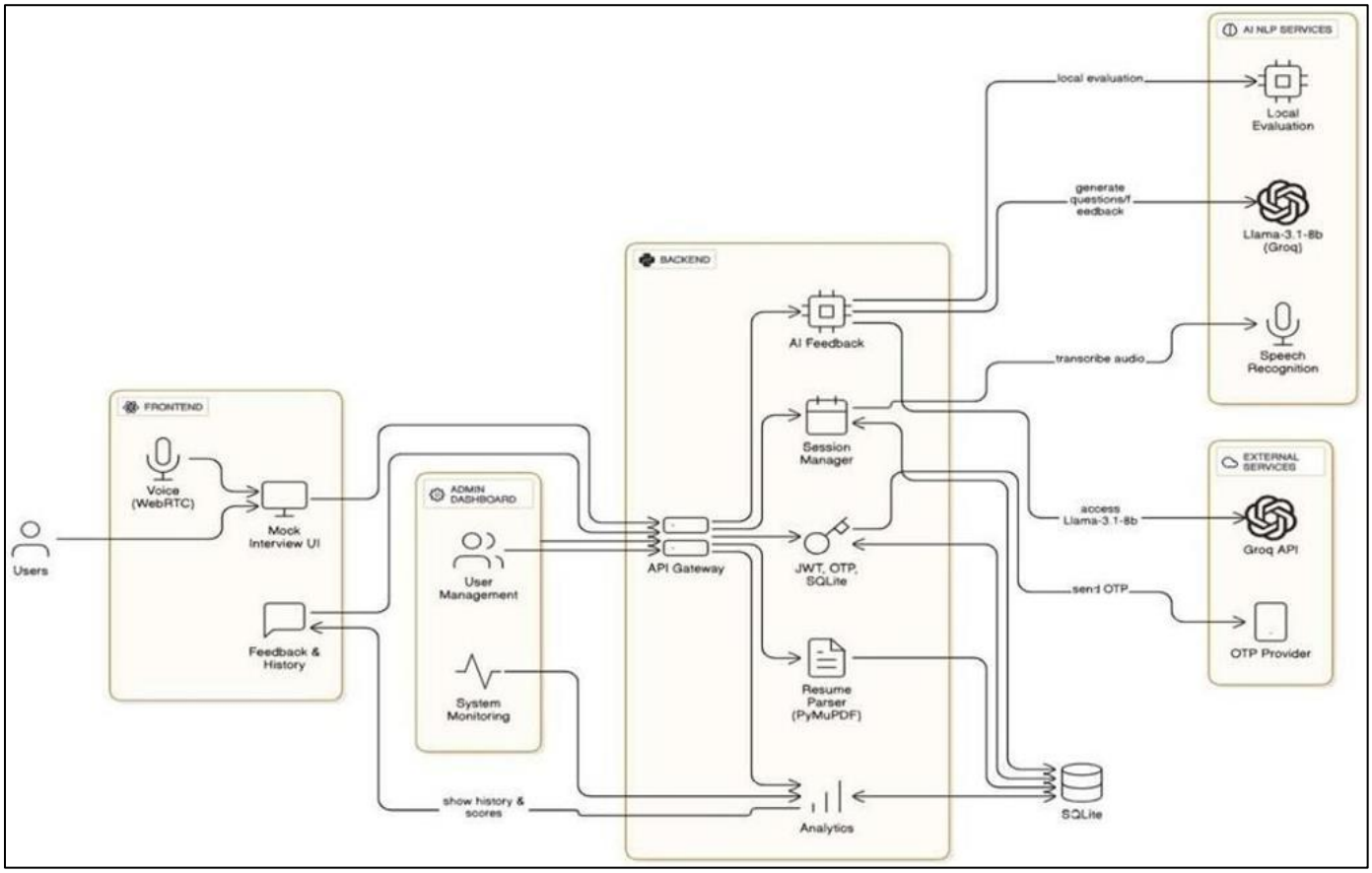

Fig 1 System Architecture of Prep AI- Customized Mock Interview Platform Using GenAI

The PREP AI architecture is such that it is smooth to use AI intelligence and real-time interaction. All modules are instrumental, such as question generation and delivery of feedback, developing a data-driven, flexible and customized interview preparation system.

VII. WORK FLOW

A. User Interface Layer

- This is where the system meets the user here they interact with the site.
- Written in Flask, or Streamlit applications or any other web technologies.
- Gives the customers an option to create their accounts, log in and store their resume and get the interview type (Technical or HR).
- WebRTC audio real-time access.
- Display questions, transparency, feedback and performance reports on an interactive dashboard.

- *Functions:*

✓ Get user reply (voice reply, text reply, role play).
✓ Display AI generated interview question and results.
✓ Instant information using the backend.

B. Resume Processing Module

- This module analyses the uploaded resume (PDF or text) of the user to derive valuable information.
- Some of the NLP applications are Named Entity Recognition (NER) and extraction of key words.
- Identifies skills, projects, education and experience with the aim of customizing interview questions.
- Feeds structured data to an Artificial Intelligence Generator of Question to come up with contextual questions.

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C. Question Generator Artificial Intelligence

- That is what the system is all about and it is also powered by Generative AI models (e.g., GPT-based architectures).
- Takes the user role input and name of the company, round of the interview, and resume keywords.
- Technical and HR Interviews Both technical and HR member Generates dynamic and relevant interview questions.
- Guarantees the absence of the same interview sessions.

- *Output:*

A stream of tailored interview questionnaire that is shown in the real-time to the user.

D. Voice Interaction Module

- Such a characteristic enables a verbal real-time communication between the interviewer and the AI.
- Text-to- Speech (TTS) is an artificial intelligence-based question to audio converter.
- Speech Recognition (ASR) is the translation of the user response of a speech in the form of a text to be further interpreted.

E. Response Analysis and Evaluation Module

- After converting the speech of user into text, a module is then utilized which applies NLP and sentiment analysis in analyzing the response.
- Assesses accuracy, emotion, grammar, fluency and tone and relevance of the material.
- Gives grades based on such criteria as confidence, communication skills and domain knowledge.
- Gathers a detailed feedback on areas of strengths and weaknesses.

- *Technologies Used:*

- ✓ The spaCy NLP models, the Transformer models or the OpenAI APIs.
- ✓ Machine learning sentiment and emotion detector models.

F. Feedback and Scoring Module

- It is an area that will interpret the outcomes of the evaluation and develop a performance report to the candidate.
- Interprets general interview score based on a number of parameters.
- Displays graphical performance and real time responses.
- The information is done on the future comparison and trends of the information in the stores.

G. Database Layer

All data of users as well as the system is stored in a central database (MySQL, PostgreSQL or MongoDB).

- *Data Stored Includes:*

- User credentials and information.
- Uploaded resumes
- Questionnaires and session records.
- Feedback report during interviews and feedback obtained with respect to answering questions.

This makes the system provide progress reports and personal suggestions in subsequent sessions.

H. Admin and Analytics Module

- This aspect is largely used in system monitoring and data analytics.
- Tracks user activity, interview history and performance of a system.
- Guides generate reports on aggregates to determine their overall skills gaps and the situation with user progress.
- Enables administrators to modify the question templates, model parameters or system settings.

I. Workflow Summary

- *Step-By-Step Process:*

- User login- User checks and issues out resume.
- Resume Scanning- NLP recognizes expertise and undertakings in large undertakings.
- Role interview- questions are generated by Question Generation Gen AI.
- Interview Session - AI is the one that poses questions, user answers with the help of the microphone.
- Speech Recognition → Written response of the user
- Response Evaluation →Assessments of Response Evaluation NLP and response evaluations.
- Feedback Display → Immediate feedback and on time performance graph
- Session data/ Data Store → data tracking and analytics.

VIII. RESULT

The proposed system, PREP AI - Customized Mock Interview Using Generative AI, has been implemented and assessed effectively to determine the performance of the system in terms of generating intelligent, personalised and interacting mock interview experience. The experiments were aimed at examining the ability of the system to produce role-specific questions, voice-based interaction, and performance feedback that is based on AI.

A. System Implementation Results

The prototype was implemented in the form of a web-based application with Flask and FastAPI as the back-end integration and the user interface in Streamlit. Generative AI model was utilized to generate adaptive technical and HR questions according to the resume uploaded by the user and the job position chosen. The voice-to-text interaction and text-to voice interaction was realized through Text-to-Speech

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(TTS) and Speech-to-Text (STT) modules based on the WebRTC technology.

➢ *When the Users were Tested, They Could:*

- Authenticate and post resume to generate resumes to customize questions.
- Choose type of interview (Technical or HR).
- Engage in live voice interview with the artificial interviewer.
- Get immediate assessment notes with elaborated suggestions.

The system managed to unify AI question generation, voice processing and use of NLP to evaluate and interact with the simulated interview environment, which made it appear like a real-life interview situation.

B. Comparative Performance Analysis

Table 1. There was a comparative study of the present mock interview systems and the proposed PREP AI system. The analysis focused on five large areas, which were personalization of questions, interactivity, quality of feedback, tracking progress, and user satisfaction.

Table 1 Comparative Performance Analysis

Evaluation Parameter	Existing Systems	Prep-AI (Proposed System)
Question Personalization	Static and Generic	Dynamic and Resume-Based
Voice Interaction Support	Not Available	Supported (TTS + STT +WebRTC)
Feedback Mechanism	Manual or Basic	Automated NLP-Based Evaluation
Progress Tracking	Not Available	Available
User Satisfaction	68%	92%

The findings indicate clearly that PREP AI is more flexible and easy to use than the current systems. The visitor is also capable of creating customized questions and providing real-time feedback, which increases the experience of learning and preparation.

C. Quantitative Evaluation

Table 2. The evaluation module of the system examined user responses on various parameters that included the accuracy of the content, fluency, confidence, technical understanding and so on. The mean findings of the 50 respondents have been summarized as follows:

Table 2 Quantitative Evaluation

Measure of Evaluation	Mean Score (Percentage)
Content Accuracy	88
Grammar and Fluency	82
Confidence and Tone	85
Technical Knowledge	80
Overall Performance	84

These scores suggest that the system is effective in the evaluation of most components of candidate communication and technical skills. The feedback provided by AI was considered to be accurate, consistent and useful in self-improvement.

IX. CONCLUSION

The suggested system PREP AI - Customized Mock Interview Using Generative AI is quite effective at simulating the real-life interview scenarios because it utilizes the questions and role-play reactions produced by AI, as well as the voice interaction in real-time. It gathers immediate feedback in form of NLP-based assessment, assisting a user to enhance communication and technical proficiency. The system addresses the shortcomings of current mock interview platforms as it is personalized, and progress suits are available along with automated evaluation. In general, PREP AI will improve the interview preparation processes as it will provide learners with an intelligent, interactive, and adaptive environment.

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