International Journal of Multidisciplinary Research and Growth Evaluation.

AI-Driven Virtual Interviewer

Kakumanu Naga Vijay Shekar [1*], Sanam Veera Venkata Mani Shankar [2], Challa Siva Prakash [3], Shaik John Ussman [4], B V V H Chandra Sekhar [5]

[1-4] Student, Department of Information Technology, Kallam Haranadhareddy Institute of Technology, (Autonomous), NH – 16, Chowdavaram, Guntur – 522019, Andhra Pradesh, India

[5] Ph.D., Assistant Professor, Department of Information Technology, Kallam Haranadhareddy Institute of Technology, (Autonomous), NH – 16, Chowdavaram, Guntur – 522019, Andhra Pradesh, India

* Corresponding Author: **Kakumanu Naga Vijay Shekar**

Article Info

ISSN (online): 2582-7138
Volume: 06
Issue: 02
March-April 2025
Received: 05-02-2025
Accepted: 27-02-2025
Page No: 566-570

Abstract

In today's competitive job market, interview preparation is an integral part of the job-seeking process, The AI Interviewer platform aims to help unemployed candidates by resolving the shortcomings of conventional interview preparation. Conventional methods are predominantly focused on knowledge-based queries, and other important factors such as communication skills, body language, and resume correctness are not handled. Current systems also fail to give customized, fine-grained feedback, which is necessary for those candidates who are interested in improving their overall interview performance. This AI-powered system provides an end-to-end interview preparation process by reviewing a candidate's resume, testing domain knowledge, and monitoring communication skills, voice tone, facial expressions, and eye contact. It also uses AI-developed interview questions based on the candidate's job description, and hence the preparation is effective and personalized. The AI also provides feedback on the knowledge of the candidates about the job role, along with corrections and suggestions to improve their knowledge.

DOI: https://doi.org/10.54660/.IJMRGE.2025.6.2.566-570

Keywords: AI Interviewer, Job Preparation, Resume Analysis, Communication Skills, Domain-Specific Questions, Interview Feedback

1. Introduction

The AI Interviewer platform addresses the issue of unemployed people not being interview-ready. Traditional approaches focus on theory without considering communication, body language, and personalized feedback. Existing solutions lack an integrated, holistic solution to interview readiness. This AI platform scans resumes, evaluates field data, and provides real-time feedback on voice tone, facial expression, and eye contact. The platform also creates job-specific interview questions for improved preparation. Through personalized coaching and formal training, the platform increases the confidence of candidates and significantly enhances their recruitment prospects. deals with both technical and interpersonal competence evaluation.

This paper investigates the AI Interview platform, and its design, development, and influence on job preparation today. Conventional interview training is too rigid for the needs of the times, leaving space for AI to step in. With personalized, AI-based feedback, mock interviews, and immediate critiques, the platform improves the job applicants' readiness, which makes them more hireable. It is crafted to be inclusive, accessible, and adaptive across industries and levels. The research examines its technology, features, and potential benefits, and ultimately shows how AI can transform interview training and redirect job applicants' preparation for openings in the future.:

The AI Interviewer Platform is an innovative, AI-powered system designed to provide personalized interview preparation by evaluating both domain knowledge and communication skills. Traditional interview training methods often overlook crucial non-verbal communication aspects such as voice tone, facial expressions, and eye contact, which play a significant role in

interview success. This platform fills that gap by offering realistic mock interviews with AI-driven feedback to help candidates enhance their interview performance and confidence.

A user-friendly interface ensures easy navigation, allowing job seekers to upload their CVs, input job descriptions, and receive comprehensive feedback on their strengths and areas for improvement. The system also creates real-time, job-specific interview simulations, ensuring that candidates practice with tailored questions relevant to the specific job role.

The paper is structured as follows:

- Section II discusses existing interview preparation systems and their limitations.
- Section III outlines the proposed system architecture.
- Section IV details the implementation of Skill-Craft.
- Section V presents the conclusion.

2. Related Work

In the last decade, AI-based solutions have been extensively explored for the best interview processes, especially for candidate assessment and training. AI has been successfully used in verbal and non-verbal communication analysis, including voice tone, facial expressions, and response accuracy, for in-depth feedback purposes of performance enhancement.

Various studies on the potential of AI to evaluate candidates differently from the norm have been carried out. For example, [1] presented an AI system that analyze's non-verbal cues and personality, which allows interviewers to identify whether a candidate is suitable for a job or not. In the same vein, [2] employed the use of facial recognition technology in automated video interviews, which enables AI to evaluate candidates' emotions and engagement levels.

AI has also proved to have immense possibility in customized job interview preparation. Chou and Yu [4] developed an AI system that reads job postings and generates customized interview questions related to specific jobs. Lee and Kim [5] also developed a system that employs both resumes and job postings to prepare interview questions tailor-made for the most applicable job requirements.

3. Proposed System

A. User-focused frontend development

The platform's frontend, built with Bootstrap and React.js, offers a smooth and responsive experience on desktop, tablet, and smartphone. With these technologies, real-time interaction is supported to allow easy browsing, uploading CVs, and instant response. Such an easy-to-use, real-time interface allows smooth and interactive interview practice.

Frontend Features:

Personal Profile Setup Candidates can upload their resume, choose the job for which they want to apply, and input interview training preferences for a personalized experience. The system scans the resume, generates personalized interview questions, and provides instant feedback on domain knowledge and communication skills. This enables candidates to prepare in a focused and effective way.

Interactive Dashboard: The platform allows users to track progress, review performance, and see interview simulations on an interactive dashboard. Mock interviews based on AI provide immediate feedback on communication, knowledge, and response accuracy. By checking past sessions and improving skills, users can improve interview performance, build confidence, and improve chances of getting employed.

B. AI-Driven backend for interview preparation

The platform's backend, built with Express.js, facilitates seamless interaction between the frontend and the AI models. It handles user login, storage, and features that are AI-powered like question generation, speech analysis, and processing feedback. The architecture provides real-time interaction so that users can get instant feedback and an interactive and seamless interview training experience.

Major Backend Functionalities:

User authentication and security: The backend is secure with user authentication and provides access only to authorized users. It reads job descriptions with Natural Language Processing (NLP) and creates personalized interview questions. Additionally, AI models scan tone, fluency, and facial expressions of speech to analyze communication skills and give detailed feedback for improvement.

C. Multimodal candidate assessment

One of the most prominent features of the platform is that it can analyze both verbal and non-verbal communication through multimodal AI analysis. It measures speech tone, fluency, facial expressions, and body language to give a complete performance report. Based on these parameters, the AI provides an overall readiness score, enabling candidates to know their strengths and weaknesses. This comprehensive approach makes users thoroughly prepared for actual interviews.

Factors for candidate assessment:

Speech recognition and tone analysis: The platform uses voice analysis to gauge a candidate's fluency, tone, and speech quality. It gives users real-time feedback on clarity, pacing, and pronunciation, assisting them in understanding areas of improvement. This helps improve communication skills so that candidates can confidently and clearly respond in actual interviews.

Facial expression and emotion recognition: The platform utilize computer vision technology to recognize facial expressions, determining feelings like confidence, anxiety, or nervousness. This enables the system to assess the emotional state of the candidate throughout the interview. Through studying non-verbal indicators, the AI delivers valuable suggestions, enabling candidates to enhance body language and overall interview presence.

D. Adaptive interview and feedback system

The website has an adaptive interview system that changes the level of difficulty and mode of questioning based on the candidate's performance and progress. As the users become better, the system presents them with increasingly difficult scenarios, providing continuous skill improvement. The dynamic nature assists candidates in becoming more confident and honing their interview skills, enabling their practice to become more effective and tailored.

Adaptive Features:

The platform uses an adaptive interviewing system that automatically adjusts depending on the performance of the candidate:

Dynamic question difficulty: The AI adapts the difficulty level of subsequent questions based on the answers given, providing a challenging yet manageable experience.

Customized Feedback: Candidates get specific feedback on their content, tone, body language, and fluency after each response.

E. Database and secure data storage

The platform provides safe storage of sensitive user data by using a two-storage strategy:

User metadata is stored securely in MongoDB, with authentication and performance monitoring.

IPFS (InterPlanetary File System) offers decentralized storage of documents, safeguarding resumes against tampering or unauthorized access.

By overlaying MongoDB's structured security on top of IPFS's decentralized architecture, the system increases data integrity, confidentiality, and redundancy, maintaining safe processing of user data.

F. AI Model integration for continuous improvement

The AI models on the platform are regularly updated and tuned for maximum effectiveness and relevance. Trained from extensive datasets, the models are calibrated to precisely measure a candidate's knowledge in the specific job role, communication abilities, and overall performance in the interview.

Natural language processing models: The AI models of the platform are trained on vast job descriptions and interview questions, enabling the system to create accurate and relevant interview questions for specific jobs.

Through industry-specific requirement analysis, the AI ensures that the candidates practice using realistic, role-based scenarios, enhancing their confidence and preparedness for real interviews. This data-driven process increases the efficacy of interview simulations by making them in sync with present hiring trends and expectations.

Users can upload resumes and choose job positions for customized interview questions. The platform supports performance tracking, where candidates can see progress, review responses, and know areas that need improvement. Such a customized method ensures efficient interview preparation by concentrating on strengths and weaknesses in verbal and non-verbal communication skills.

The AI model helps to learning from the training data and enhance its usage according to the user requirements. I help's user to interact and communicate easily

Speech and image recognition models: The AI of the platform is consistently updated to improve speech recognition, emotion detection, and facial expression analysis.

Ongoing improvements refine tone analysis, confidence scoring, and body language interpretation, making interview practice more efficient and informative.

G. System architecture overview

The system architecture is modular, and there are three main layers:

Frontend Layer: Developed using React.js and Bootstrap, giving a user-friendly interface to candidates.

Backend Layer: Powered by Express.js, which takes care of authentication, AI model run, and handling of data.

AI Model Layer: A blend of NLP, speech recognition, and computer vision technologies that drive the personalized interview preparation system.

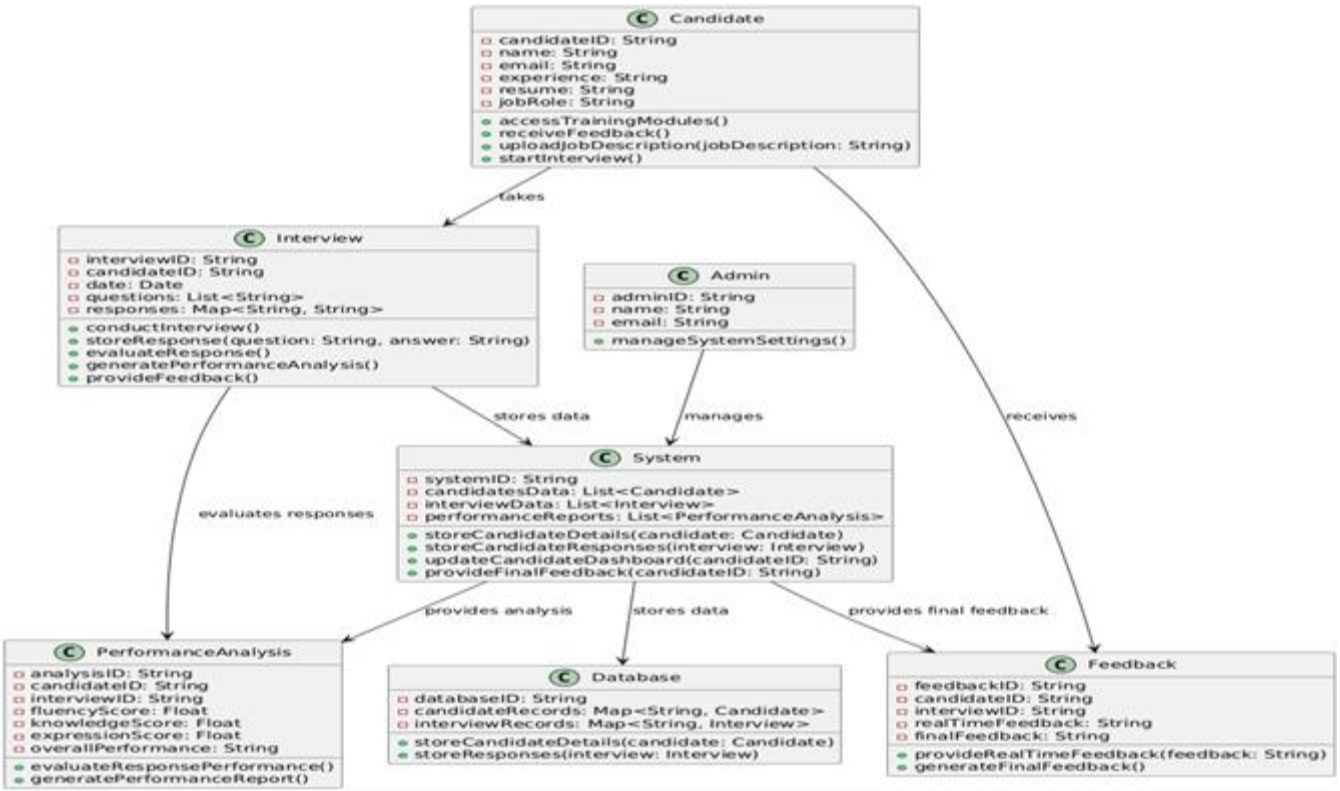

Fig 1: Architecture overview of the different participants

The architecture of the system is scalable, efficient, and secure, making it possible for users to depend on it for ongoing, personalized interview preparation.

4. Implementation

A. User interface development

The interview preparation platform powered by AI has a

responsive, user-friendly interface developed using React.js and Bootstrap, which provides a contemporary, responsive look that can be accessed on desktops, tablets, and smartphones. The responsive design makes it easy for users to create individual profiles, upload resumes, and define job positions for customized interview preparation. Dynamic interactions are provided by React.js, with real-time performance tracking and feedback for an improved user experience. The integration of these technologies provides simple navigation, prompt responsiveness, and interactive functionality, rendering the platform extremely efficient for the candidate wishing to enhance interview skills effectively.

Users can upload resumes and choose job positions for customized interview questions. The platform supports performance tracking, where candidates can see progress, review responses, and know areas that need improvement. Such a customized method ensures efficient interview preparation by concentrating on strengths and weaknesses in verbal and non-verbal communication skills.

This method takes inspiration from Chou and Yu (2023) [4], who focused on the necessity of intuitive interfaces in resume-analyzing and candidate-matching systems, thus making the process of preparing for a job effective and easy to use [4].

B. Backend system with AI integration:

The backend, developed using Express.js, facilitates seamless communication between the frontend and AI models. The backend handles user inputs, authentication, and AI-powered features such as speech and facial expression analysis. This design allows for effective data processing, secure access, and seamless integration of sophisticated AI features to provide an improved interview preparation experience.

It incorporates the following components:

User Authentication: Provides data security and privacy, allowing authorized users to access customized training sessions and resume feedback.

Speech Analysis: The backend uses speech-to-text and tone analysis APIs, allowing real-time evaluation of a candidate's oral communication skills, such as pitch, clarity, and fluency.

Facial expression recognition: Using computer vision APIs, the backend takes a snapshot of facial expressions and determines emotions like confidence or nervousness, which are critical in analyzing non-verbal communication.

C. AI-Based question generation

The system uses Natural Language Processing (NLP) and machine learning to create interview questions that are suited for a particular field.

Skill Extraction: AI scans job posts to determine required skills and qualifications needed for the position.

Question Generation: From information extracted, the system generates appropriate interview questions to evaluate the candidate's knowledge, problem-solving capacity, and communication skills.

Adaptability: The system continuously changes the difficulty of questions based on the candidate's answers to maintain a balanced challenge that supports development without becoming daunting.

D. Adaptive feedback and personalized learning path

The AI-powered platform uses adaptive learning algorithms to provide customized feedback and guided learning pathways for candidates.

Instant Feedback: Candidates get instant assessments of domain knowledge and communication skills, along with actionable recommendations for improvement.

Personalized learning path: The system adaptively updates interview questions and training emphasis depending on performance for directed skill development.

Motivational Feedback: Positive feedback reinforces candidate confidence, sustaining motivation during the training process.

Innovative and inspired by Nagasawa *et al* (2024) [3], who designed adaptive interview strategies, this method guarantees a tailored and interactive learning process, enabling candidates to sharpen their skills appropriately.

E. Data storage and security

The platform maintains data integrity and confidentiality through a MongoDB and IPFS hybrid database solution:

MongoDB for user & metadata storage: Stores user profiles, authentication information, access logs, and metadata about interview sessions and progress tracking securely.

IPFS document storage: Sensitive documents such as resumes and interview records are kept in a decentralized, tamper-proof state through the InterPlanetary File System (IPFS), maintaining data integrity and controlled access.

Through the coupling of IPFS decentralized security with MongoDB's scalability, the platform assures secure, scalable, and privacy-centric management of user data, which is best practice in treating sensitive AI-generated information.

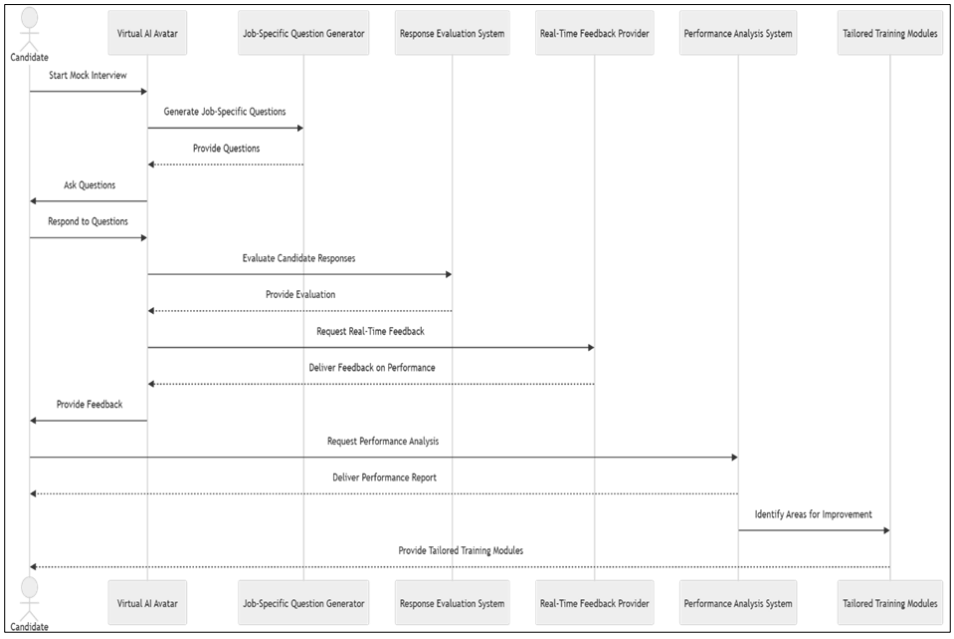

Fig 2: Sequence Diagram

5. Conclusion and future enhancement

AI-Powered Virtual Interviewer transforms job preparation by data-based, individualized feedback improving technical as well as interpersonal competencies. Through third-party integrations, sophisticated voice recognition, facial recognition, and gamification, the platform provides end-to-end training. By integrating real-time job market data, multilingual capabilities, and behavioral psychology, Skill Craft prepares candidates for various interview situations. As the technology continues to develop, these technologies will create a more efficient, equitable, and engaging interview process, eventually closing the gap between employers and candidates for improved hiring results.

6. References

1. More AS, Mobarkar SS, Salunke SS, Chaudhari RR. Smart interviews using AI. Int J Curr Eng Sci Res (IJCESR). 2022;9(1). ISSN (Print): 2393-8374, (Online): 2394-0697.
2. Kim C, Lee W, Choi J, Yoon J, Yoo D. Fairness-aware multimodal learning in automatic video interview assessment. IEEE Access. 2023;10.
3. Nagasawa F, Okada S, Ishihara T, Nitta K. Adaptive interview strategy based on interviewees' speaking willingness recognition for interview robots. IEEE Trans Affect Comput. 2024;15(3): Jul.–Sep.
4. Chou YC, Yu HY. Based on the application of AI technology in resume analysis and job recommendation. Digital Education Institute, Institute for Information Industry. Taipei, Taiwan ROC, 2023.
5. Lee BC, Kim BY. Development of an AI-based interview system for remote hiring. Int J Adv Res Eng Technol. 2021;12(3):654–63. Article ID: IJARET_12_03_060. doi: 10.34218/IJARET.12.3.2021.060.
6. Na SR. Application of artificial intelligence in recruitment and selection. Acad J Sci Technol. 2024;9(2):1–10.
7. Majidi B, Ashrafi S, Razavi Hajiagha SH, Akhtarkavan E. Efficient resume-based re-education for career recommendation in rapidly evolving job markets. IEEE Access.2023;11:1–10. doi: 10.1109/ACCESS.2023.3329576.
8. Suen HY, Hung KE, Lin CL. TensorFlow-based automatic personality recognition used in asynchronous video interviews. IEEE Access. 2019; 7:118173–84. doi: 10.1109/ACCESS.2019.2902863.
9. Zhang W, Yan R, Yuan L. How generative AI was mentioned in social media and academic field? A text mining based on internet text data. IEEE Access. 2024; 12:1234–45. oi: 10.1109/ACCESS.2024.3379010.