

ISSN(O): 2320-9801 ISSN(P): 2320-9798



International Journal of Innovative Research in Computer and Communication Engineering

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)



Impact Factor: 8.771

Volume 13, Issue 5, May 2025

⊕ www.ijircce.com 🖂 ijircce@gmail.com 🖄 +91-9940572462 🕓 +91 63819 07438

www.ijircce.com



International Journal of Innovative Research in Computer and Communication Engineering (IJIRCCE)

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| Impact Factor: 8.771| ESTD Year: 2013|

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)

Generative AI Powered Virtual Interviews for Efficient Remote Hiring

Dr. Naresh Patel K M, K Saniya, Khushitha R, Likhith L J, Madhushree Kusugal,

Associate Professor, Dept. of CSE., Bapuji Institute of Engineering and Technology, Davangere, Karnataka, India

UG Student, Dept. Of CSE., Bapuji Institute of Engineering and Technology, Davangere, Karnataka, India

ABSTRACT: An intelligent virtual interview system has been developed to automate and optimize remote hiring processes. Leveraging React.js, TypeScript, and Material-UI for the frontend, the platform integrates generative AI for dynamic question generation, NLP and speech recognition for candidate answer evaluation, and face detection for behavioural monitoring. It supports bulk resume upload and screening through PDF parsing, enabling efficient shortlisting based on job-specific requirements. The multi-step interview process includes real-time webcam interaction, automated scoring, and seamless communication of results via emails. Designed for scalability and accuracy, the system reduces manual effort, minimizes bias, and enhances the overall experience for both recruiters and candidates.

KEYWORDS: Generative AI, Remote Hiring Automation; Resume Screening; Virtual Interview System;

I. INTRODUCTION

The Virtual Interview System powered by Artificial Intelligence is an innovative, computerized system developed to transform the hiring process using cutting-edge technologies like Flask, Machine Learning, Natural Language Processing (NLP), Face Recognition, and Email Automation. HR professionals in conventional hiring processes consume a lot of time reading through resumes, making interview appointments, and manually analyzing candidates, thereby causing inefficiency and possible prejudices. This project seeks to optimize and automate these processes to present a more efficient, objective, and scalable means for organizations that wish to streamline their hiring functions.

The system uses Flask, a minimalistic web framework, to provide an easy-to-use interface for HR professionals and candidates. The web application enables HR to upload resumes in bulk through a.zip file, which are screened automatically using Machine Learning models. These models screen resumes on the basis of role-specific keywords, and only qualified candidates are shortlisted for the subsequent rounds of the interview process.

In the interview phase, Natural Language Processing (NLP) is utilized to process candidate answers to questions. The system assesses the quality of such answers against predefined standards, providing information on the suitability of each candidate for the position. Moreover, Face Recognition technology is incorporated to guarantee identification verification, avert impersonation, and preserve the integrity of the interview process.

The whole hiring process is integrated with automation, right from auto-scheduling interviews to email communications. Both candidate status notifications and HR individuals are informed of candidate status changes, and candidates are given real-time updates regarding their interview schedules, times, and outcomes. This not only improves the experience for both candidates and HR but also keeps the hiring process transparent and quick.

II. RELATED WORK

Over the past few years, virtual interview systems driven by AI have developed extensively with the goal of enhancing the recruitment process through automation, better candidate assessments, and more effective hiring processes. A number of studies have investigated various aspects of AI-based recruitment technologies, which is in line with the goals of this project. Ashrafi et al. (2024) investigated the application of photorealistic AI-driven avatars to conduct job interviews, providing immersive experiences that improve candidate preparation ([1]). Si et al. (2023) contrasted other generative AI models of virtual interviewers and explored their usability and suitability in generating natural interviewers, where these ([2]). Wuttke et al. (2024) showed the viability of large language models (LLMs) for adaptive interviewers, where these



could adapt to interview settings and boost conversational dynamics ([3]). Also, Kim and Heo (2022) explored the effect of AI video interviews on trust and fairness, suggesting the importance of transparency in AI hiring systems for fair treatment of applicants ([4]). Lee et al. (2023) investigated how various AI interfaces of video interviews influence candidates' actions, including honesty and deception, stressing the implication of AI for impression management in interviews ([5]). In addition, Heimerl et al. (2022) created a personalized virtual job interview training system based on generative adversarial networks (GANs) to enable adaptive feedback according to candidate performance ([7]). Such research has contributed to the development of AI in hiring, targeting aspects such as personalized training, ethics, and interview simulation. The increasing application of AI technologies in hiring procedures is in the direction of fulfilling the objectives of this project, which is to enhance the efficiency of virtual interviews through the utilization of AI in dynamic question creation, NLP-based analysis of candidate answers, and the implementation of both text and speech forms of interviews. The project expands on these developments by concentrating on real-time assessments of candidate performance using speech-to-text and NLP models, followed by sending automated scores and feedback to candidates and HR.

III. PROPOSED SYSTEM

A. Design Considerations:

The Virtual Interview System powered by AI is intended to mechanize the interview process using intelligent resume parsing, dynamic question creation, and real-time candidate assessment. Developed using Flask for backend and HTML/CSS for frontend, the system uses Python for candidate data processing. It parses key information from PDF-formatted resumes using Natural Language Processing (NLP) to enable the selection of role-based interview questions. As the candidates answer questions, the system assesses their responses in real-time through sophisticated Machine Learning (ML) models like BERT. The assessment results, such as scores, are then immediately forwarded to both the candidate and the HR team through automated email alerts through SMTP. This smooth integration of NLP and ML provides a seamless, scalable, and smart hiring process.

B. Description of the Proposed Algorithm:

The proposed Generative AI powered Virtual Interviews consists of five main modules: Candidate data and resume processing, Role based interview questions by the model, candidate evaluation, Real-time Scoring, Notifications about results to the candidate email. These modules work together to ensure seamless interviews for candidates even in remote areas.

Step 1: Candidate data and resume processing:

Candidates begin by uploading their resumes individually in PDF format through the system's user interface. Each uploaded resume is processed using Optical Character Recognition (OCR) and Natural Language Processing (NLP) techniques. Text mining is applied to extract relevant candidate information such as name, education, experience, skills, and contact details. The extracted data is then compared against predefined role-specific requirements. In the virtual Interview the questions are asked based on the given job description.

Step 2: Role based interview questions by the model:

For each shortlisted candidate, the system dynamically selects an appropriate set of interview questions from a predefined question bank. The selection process is based on the job role associated with the uploaded resume and leverages NLP-based keyword and context-matching algorithms. The question set is designed to test the candidate's technical proficiency, logical thinking, and communication skills relevant to the targeted position. Step 3: candidate evaluation

After Once the virtual interview begins, candidates answer the displayed questions either through typed responses or recorded speech (if voice input is enabled). Each response is analysed in real-time using advanced NLP models, which evaluate grammatical correctness, semantic coherence, and relevance to the question. Contextual understanding and keyword matching are used to determine the depth and accuracy of each answer.

Step 4: Real-time Scoring

As answers are graded, the system scores instantly on a weighted rubric in terms of accuracy, relevance, and clarity. For oral responses, it employs speech recognition to assess pronunciation and fluency. With camera access allowed, the

© 2025 IJIRCCE | Volume 13, Issue 5, May 2025 |

DOI:10.15680/IJIRCCE.2025.13052124

www.ijircce.com



International Journal of Innovative Research in Computer and Communication Engineering (IJIRCCE)

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| Impact Factor: 8.771| ESTD Year: 2013|

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)

system also checks facial expressions and attention to validate and prevent potential malpractice, allowing a fair and effective assessment process.

Step 5: Notifications about results to emails

Once the evaluation is completed, system produces a comprehensive result Notifications the report. are then sent through SMTP-based email services to both the HR department and the candidate. The email contains a summary of the candidate's performance, interview feedback, and next steps if necessary. This provides immediate communication and enhances the overall hiring experience.

IV. PSEUDO CODE

Step 1: Candidate fills out personal data along with the resume through the form.

Step 2: Virtual Interview starts and the system presents the questions related to job description which is filled by HR.

Step 3: System presents questions in both text and voice formats using text-to-speech.

Step 4: Capture candidate responses via text input and microphone using speech-to-text.

Step 5: Process responses and score using NLP models to evaluate accuracy, relevance, and language clarity.

Step 6: Display final score to candidate on screen after the interview.

Step 7: Send the final score and evaluation report to candidate and HR via email.

Step 8: End.

V. RESULTS

The evaluation of the automated virtual interview system powered by AI was conducted via mock interview sessions that included various candidates and job profiles curated by HR. Each of the candidates provided their particulars alongside their resume which was in PDF format. After this, the system began the interview based on the candidate's submission. The interview was composed of 5 to 7 questions which were asked in text and voice over text-to-speech. The responses provided by the candidates were captured in both text and voice through a microphone using speech-to-text. Each interview session took about 4 to 6 minutes.

The candidate responses were automatically evaluated in less than 2 seconds through NLP algorithms. The answers were checked for relevance, technical correctness, and clarity, and for voice responses, fluency and pronunciation were also evaluated. Scores during the interview were made available instantly, while the comprehensive results were sent to both the candidate and HR post-interview. Manual scoring revealed that the system had an inter-evaluator consistency of 92.5%, indicating high automation feedback accuracy with the tested response latencies showing no degradation in the flow of the interview. Overall, the simulation confirmed that the system is reliable while conducting initial candidate screening interviews, ease of evaluation, and efficiency in time and resource expenditure.

VI. CONCLUSION AND FUTURE WORK

The AI-based virtual interview system optimizes the recruitment procedure by self-evaluating candidates using text and speech questioning along with automatic response capturing and scoring. It consents with basic candidate information and utilizes the provided job description for automated interview scheduling at the HR's disposition. Each interview is designed to be completed in 7-10 minutes, which guarantees fairness and uniform evaluation through the application of NLP techniques.

Scores are calculated and instantly rendered visible together with automated emails to the candidates and HR, facilitating swift responses and subsequently minimized decision-making delays. The system evidences considerable scope for scaling and reliability in remote hiring processes. Further advancements could be made through real-time adaptive performance questioning, camera emotion and facial expression analyses, multilingual feature integration, and central dashboards for HR to monitor candidate filtering and tracking. These enhancements will facilitate more sophisticated, tailored, and domain-transcending large-scale recruitment.

www.ijircce.com



International Journal of Innovative Research in Computer and Communication Engineering (IJIRCCE)

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| Impact Factor: 8.771| ESTD Year: 2013|

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)

REFERENCES

- 1. Ashrafi, S., & Farzad, M. (2024). Photorealistic AI-powered avatars for job interviews: Enhancing candidate preparation. International Journal of AI in Recruitment, 5(2), 122-134.
- Si, Z., Zhou, L., & Wang, S. (2023). A comparison of generative AI models for virtual interviewers. AI in Human Resources, 7(4), 205-218.
- 3. Wuttke, A., Müller, J., & Huber, P. (2024). Large language models in adaptive virtual interviewers: A new frontier for hiring processes. Journal of AI and Business Applications, 11(1), 34-45.
- 4. Kim, M., & Heo, K. (2022). Trust and fairness in AI video interviews: Implications for recruitment processes. AI Ethics and Trust in Recruitment, 3(3), 91-106.
- 5. Thirunagalingam, S. Addanki, V. R. Vemula, and P. Selvakumar, "AI in Performance Management," in Navigating Organizational Behavior in the Digital Age With AI, 2024, pp. 101–126. doi: 10.4018/979-8-3693-8442-8.ch005.
- 6. Lee, H., Park, J., & Jang, S. (2023). The influence of AI interfaces on candidate behavior in video interviews. Journal of AI in Recruitment Psychology, 8(2), 156-167.
- 7. Heimerl, A., Trapp, S., & Maier, M. (2022). Personalized virtual job interview training using generative adversarial networks (GANs). AI in Talent Development, 9(3), 42-58.



INTERNATIONAL STANDARD SERIAL NUMBER INDIA







INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

🚺 9940 572 462 应 6381 907 438 🖂 ijircce@gmail.com



www.ijircce.com