AI-Based Mock Interview Platform

Prof. Seema V. Bhujade[1], Miss. Supriya Dhakane[2], Miss. Mansi Bombade[3], Mr. Atharv Salke[4]

[1]*Prof. Seema V. Bhujade, Zeal College of Engineering and Research, Pune*
[2]*Supriya Dhakane, Zeal College of Engineering and Research, Pune*
[3]*Mansi Bombade, Zeal College of Engineering and Research, Pune*
[4]*Atharv Salke, Zeal College of Engineering and Research, Pune*

---***---

Abstract - This paper presents an AI-powered mock interview platform developed to assist job seekers in enhancing their interview performance through an automated and realistic environment. The system integrates advanced speech recognition, natural language processing, and multimodal behavioural analytics to assess candidates' communication skills, technical understanding, confidence level, and overall behavioural attributes. Unlike conventional interview preparation methods, the proposed platform provides instant feedback, personalized recommendations, and progress tracking to help users identify their strengths and areas for improvement. Experimental evaluations demonstrate that the system effectively enhances candidates' preparedness and self-confidence by delivering adaptive and constructive feedback tailored to individual performance.

Key words: Artificial Intelligence, Mock Interview, Speech Recognition, Behavioural Analysis, Feedback System, Candidate Evaluation.

1.INTRODUCTION

In today's competitive job market, many candidates fail to perform well in interviews not because of inadequate technical knowledge but due to insufficient communication skills, low confidence, and lack of structured preparation. Traditional interview preparation methods, such as static question-answer sets or peer-based mock interviews, fail to provide comprehensive, unbiased, and real-time evaluation. These approaches often overlook crucial behavioral and non-verbal cues that significantly influence an interviewer's perception.

To overcome these limitations, there is a growing need for an intelligent and automated platform that can assess both technical proficiency and soft skills in a realistic environment. The proposed system introduces an AI-based mock interview platform that leverages speech recognition, natural language processing, and video analytics to analyze a candidate's verbal and non-verbal responses. This platform provides detailed feedback, personalized recommendations, and progress tracking, thereby enhancing the overall preparedness and confidence of candidates.

2. Body of Paper

2.1 Literature Review / Related Work

Existing research on Artificial Intelligence in education and virtual interview systems has shown promising developments; however, most are limited to specific functionalities. Popular platforms such as *HackerRank* and *InterviewBit* mainly emphasize technical or coding assessments, often overlooking crucial aspects like communication, confidence, and behavioral evaluation. Recent advancements in multimodal analytics and emotion detection highlight the potential for evaluating non-verbal communication. Nevertheless, there is still a lack of an integrated system that combines technical, behavioral, and communication-based assessments within a single, AI-driven platform.

2.2 Problem Statement

The primary challenge is to design and develop a smart mock interview platform capable of conducting AI-based interviews that evaluate multiple dimensions of candidate performance. The platform should:

1. Conduct mock interviews for all domains using AI assistance.
2. Evaluate candidates based on parameters such as knowledge, clarity, fluency, confidence, and body language.
3. Provide real-time, unbiased feedback and recommendations to enhance job readiness and self-confidence.

2.3 Objectives

- To build a realistic AI-powered mock interview platform.
- To assess communication and non-verbal behaviour through speech and facial expression analysis.
- To generate automated feedback reports supported by performance metrics.

- To recommend personalized practice resources and monitor candidate progress.

2.4 Methodology

The proposed system architecture consists of the following core modules:

- **Frontend:** Developed using ReactJS, which provides an interactive and user-friendly interface. Various React libraries, including **React Speech Library**, are utilized for real-time speech capture, transcription, and user interaction.
- **Backend:** Implemented using Flask, which manages data flow, model integration, and the logic for analysis and feedback generation.
- **Database:** A **PostgreSQL** database stores user credentials, interview recordings, transcripts, and feedback reports.
- **Feedback Generator:** Produces structured and adaptive feedback reports based on speech, behavioural, and performance data.

Algorithms and Tools Used:

- **Speech Recognition:** React Speech Library (Web Speech API).
- **Keyword and Response Evaluation:** TF-IDF and rule-based logic.
- **Soft Skill and Confidence Analysis:** Tone and prosody-based evaluation.
- **Emotion Detection:** CNN and LSTM-based facial expression analysis models.
- **Feedback Generation:** Hybrid rule-based and adaptive suggestion mechanism.

2.5 Implementation

The frontend is developed using ReactJS, integrating multiple libraries for voice input, animations, and interface design. The backend uses Flask to handle user authentication, data processing, and report generation. The React Speech Library processes verbal responses, while CNN models analyse facial expressions. All interview data and generated feedback are stored in a PostgreSQL database. The platform is deployed on AWS or Azure cloud servers to ensure scalability, security, and high availability.

2.6 Results and Discussion

Pilot testing was conducted with 20–50 participants, revealing a noticeable improvement in their communication skills, confidence, and technical clarity. Evaluation metrics included accuracy of response analysis, fluency rate, and overall user satisfaction. The

feedback results demonstrated that the proposed platform significantly enhances candidate preparedness by providing real-time, constructive, and personalized feedback.

Fig -1
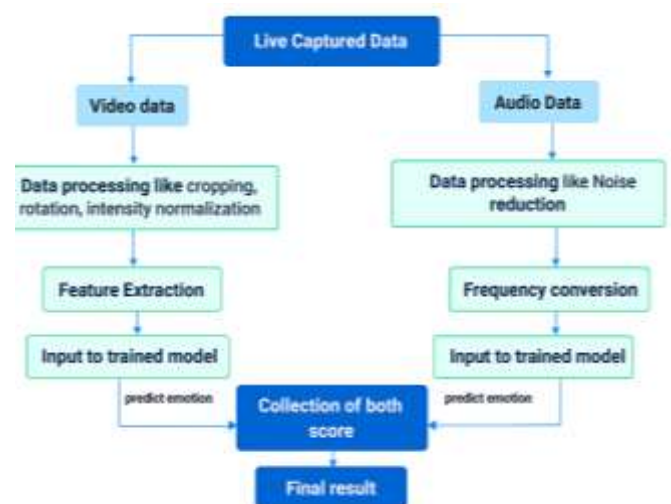
2.7 System Architecture

Fig -2: Architecture

2.8 Limitations

- Speech recognition accuracy may decrease in noisy environments.
- Facial analysis performance may vary under poor lighting conditions.
- Continuous internet connectivity and high processing power are required for optimal functioning.

2.9 Future Scope

Future enhancements may include the integration of Virtual Reality (VR) or Augmented Reality (AR) for immersive interview simulations, group discussion modules, multilingual interview support, and AI-driven resume evaluation and job recommendation features to provide a complete career readiness solution.

Fig -3: Figure

3. CONCLUSIONS

The proposed AI-based mock interview platform overcomes the drawbacks of traditional methods by providing adaptive, multimodal evaluation with instant feedback and analytics. It enhances candidate confidence and interview readiness. Future work includes reducing bias, adding multilingual support, and incorporating immersive simulations for a more realistic experience.

ACKNOWLEDGEMENT

REFERENCES

[1] Y. C. Chou, F. R. Wongso, C. Y. Chao, and H. Y. Yu, "An AI Mock-Interview Platform for Interview Performance Analysis," *Proc. 10th Int. Conf. Information and Education Technology (ICIET)*, 2022, pp. 118–122. [Online]. Available: https://www.scribd.com/document/774076958/An-AI-Mock-interview-Platform-for-Interview-Performance-Analysis

[2] I. Naim, M. I. Tanveer, D. Gildea, and M. E. Hoque, "Automated Analysis and Prediction of Job Interview Performance," *IEEE Trans. Affective Comput.*, vol. 9, no. 2, pp. 191–204, Apr.–Jun. 2018. [Online]. Available: https://arxiv.org/pdf/1504.03425

[3] R. Kadam, P. Patil, and S. Deshmukh, "AI Powered Mock Interview System with Real-Time Voice and Emotion Recognition," *Int. J. Novel Res. Dev. (IJNRD)*, vol. 8, no. 2, pp. 45–50, 2025. [Online]. Available: https://www.ijnrd.org/papers/IJNRD2502318.pdf

[4] A. Sharma, M. Patil, and R. Tambe, "AI-Powered Mock Interview Coach," *Int. J. Res. Publ. Rev. (IJRPR)*, vol. 6, no. 12, pp. 400–405, 2024. [Online]. Available: https://ijrpr.com/uploads/V5ISSUE12/IJRPR36859.pdf

[5] V. Jadhav, P. Desai, and K. Gaikwad, "AI Based Mock Interview System," *Int. J. Res. Publ. Rev. (IJRPR)*, vol. 6, no. 5, pp. 280–285, 2025. [Online]. Available: https://ijrpr.com/uploads/V6ISSUE5/IJRPR45237.pdf

[6] S. Pawar, A. Kadam, and M. Patil, "Mock Interview Evaluator Powered by AI," *Int. J. Sci. Res. Technol.*, vol. 3, no. 2, pp. 80–85, 2024. [Online]. Available: https://www.researchgate.net/publication/391976964_MOCK_INTERVIEW_EVALUATOR_POWERED_BY_AI

[7] A. Shinde, R. Patil, and P. Joshi, "NexInterview – AI-Driven Mock Interview Preparation Platform," *Int. J. Adv. Res. Sci. Comput. Technol. (IJARSCT)*, vol. 3, no. 4, pp. 125–130, 2024. [Online]. Available: https://www.ijarsct.co.in/Paper26835.pdf

[8] D. Frauendorfer, M. S. Mast, and D. Gatica-Perez, "Hire Me: Computational Inference of Hirability in Employment Interviews Based on Nonverbal Behavior," *IEEE Trans. Multimedia*, vol. 16, no. 4, pp. 1018–1031, Jun. 2014. [Online]. Available: https://www.cs.rochester.edu/u/gildea/pubs/naim-fg15.pdf