MockMeUp: An Interview Coach

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ABSTRACT

Interview preparation is often limited to practicing technical questions, while other crucial aspects such as body language, confidence, eye contact, and clarity of speech are frequently neglected. Many students, especially from rural or underprivileged backgrounds, do not have access to professional interview coaching or structured feedback. This gap creates anxiety and reduces their chances of success during real interviews.

To address this problem, we propose MockMeUp, an AI-powered interview coaching system that provides real-time evaluation of both verbal and non-verbal communication skills. The system uses webcam and microphone input to analyze behavioral cues such as eye contact, facial expressions, head posture, and distractions. At the same time, speech is processed to evaluate clarity, tone, hesitation, and confidence level. The platform also supports multiple interviewer personas including HR, Technical, and Stress interview modes to simulate realistic interview environments.

Based on the collected performance metrics, the system generates an overall score, identifies weak areas, and provides a personalized improvement plan. The goal of this system is to make interview preparation accessible, affordable, and structured for students and job seekers.

Index Terms: Mock Interview, Behavioral Analysis, Speech Evaluation, Interview Coaching

I. INTRODUCTION

In today's competitive job market, securing employment requires more than just technical knowledge. Employers evaluate candidates based on communication skills, confidence, emotional stability, and professional behavior. However, many students focus primarily on academic preparation and neglect soft skills development.

Traditional interview coaching requires human mentors, mock panels, or training institutions. These services are often expensive and not easily available to every student. Additionally, human feedback may sometimes be subjective and inconsistent.

Recent advancements in computer vision, speech processing, and intelligent systems have made it possible to analyze human behavior digitally. These technologies provide an opportunity to build automated systems that simulate interview scenarios and offer structured, data-driven feedback.

The proposed system, MockMeUp, is designed to bridge this gap. It integrates behavioral analysis and speech evaluation within a unified platform. By providing immediate feedback and personalized improvement suggestions, the system helps candidates practice interviews independently and improve their performance gradually.

II. LITERATURE REVIEW

Several researchers have explored the use of technology to improve interview preparation and evaluation systems. Early studies mainly focused on automated systems that assist candidates in practicing interview questions through online platforms. These systems provide question banks and chatbot-based interview simulations, helping candidates practice answering common interview questions. However, most of these platforms concentrate only on the correctness of answers and do not evaluate the delivery style or communication behavior of candidates [1].

Speech analysis has also been widely used in interview evaluation systems. Researchers have developed techniques to analyze speech characteristics such as tone, pitch, fluency, pause frequency, and hesitation patterns. These features help measure

a candidate's confidence level and communication effectiveness during interviews. Although speech-based systems provide useful insights into verbal communication skills, they often fail to consider non-verbal cues such as facial expressions and body language, which also play an important role in interview performance [2].

Recent studies have emphasized the importance of behavioral analysis using video processing techniques. Computer vision methods are used to detect facial expressions, eye contact consistency, head movement, and other body language indica- tors. These behavioral factors significantly influence how inter- viewers perceive a candidate's confidence and professionalism. Research shows that analyzing such non-verbal communication can improve the accuracy of interview performance evaluation systems [4].

Some researchers have also worked on multimodal interview analysis systems that combine both speech and visual behav- ioral features. These systems integrate audio and video data to analyze what the candidate says as well as how the candidate behaves during the interview. Multimodal analysis improves the reliability of evaluation by considering multiple aspects of human communication simultaneously [5], [10].

Other studies have explored personality prediction and hiring decisions using behavioral cues obtained from video interviews. Features such as head pose, gaze direction, and social attention patterns have been used to estimate personality traits and com- munication skills of candidates. These approaches demonstrate the potential of artificial intelligence in automating interview assessment processes [6], [7].

Speech analysis has been widely used to evaluate communi- cation effectiveness in interview scenarios. Researchers have applied speech processing techniques to analyze vocal features such as tone variation, pitch, speech clarity, pause duration, and hesitation frequency. These parameters help determine the confidence and fluency level of candidates while answering interview questions. Speech-based analysis systems are useful in identifying verbal weaknesses such as excessive pauses, filler words, or monotone speech patterns. However, these systems mainly concentrate on verbal communication and do not consider visual behavioral cues that also influence interview performance [2], [9].

III. System Architecture

The MockMeUp system follows a modular architecture to ensure flexibility and scalability. The system consists of the following main modules:

A. Frontend Interface

The frontend provides a web-based interface where users can log in, select interview type, and start mock interview sessions. The webcam and microphone are activated to capture real-time video and audio input.

B. Backend Processing

The backend manages communication between different modules. It receives video and audio streams, processes user requests, and coordinates analysis modules.

C. Behavior Analyzer Module

This module processes video input to detect eye contact consistency, facial expressions, head movement, and distraction patterns. Behavioral metrics are calculated frame-by-frame and summarized at the end.

D. Speech Analyzer Module

The speech analyzer converts speech to text and evaluates tone variation, clarity, confidence level, and hesitation frequency. It focuses on communication quality rather than content cor- rectness.

E. Evaluation Engine

The evaluation engine integrates both behavioral and speech metrics to calculate confidence score, clarity score, behavioral stability score, and overall performance score.

F. Report Generation Module

The final module generates a detailed performance report including section-wise analysis and personalized improvement suggestions.

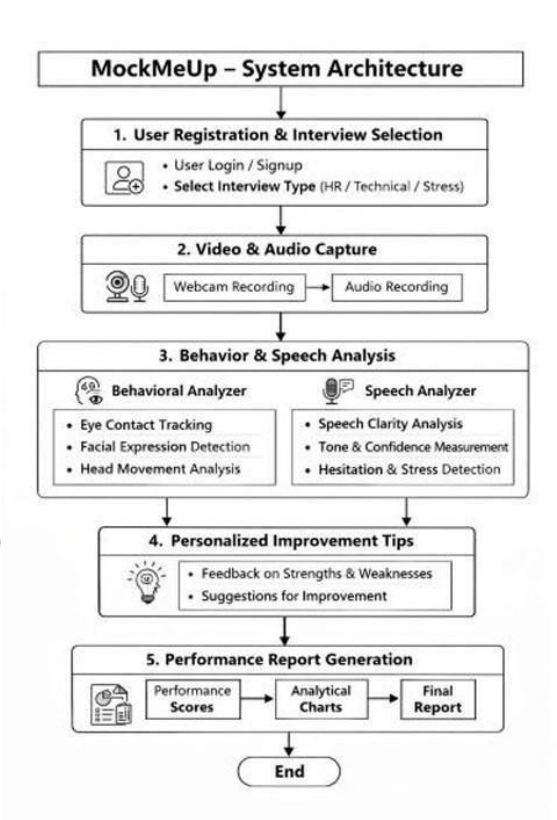

Fig. 1. System Architecture

IV. System Implementation

The MockMeUp system is implemented as a web-based ap- plication that integrates computer vision and speech processing techniques to evaluate interview performance. The implemen- tation is designed to be modular so that each component can

function independently while working together as a complete system.

A. Frontend Implementation

The frontend of the system is developed using HTML, CSS, and Bootstrap to provide a clean and responsive user interface. The interface allows users to:

- Register and login securely
- Select interview mode (HR, Technical, Stress)
- Start and end mock interview sessions
- View performance results and feedback

JavaScript is used to handle webcam and microphone activation. The interface is designed to be simple and easy to use so that students can focus on practicing rather than navigating complex menus.

B. Backend Implementation

The backend is developed using the Flask framework in Python. Flask handles routing, request processing, session management, and communication between different modules.

When a user starts a mock interview session:

1) The webcam captures real-time video frames.
2) The microphone records audio input.
3) The captured data is sent to analysis modules.

The backend ensures synchronization between video processing and speech processing modules. It also manages evaluation score calculation and report generation.

C. Behavior Analyzer Implementation

The Behavior Analyzer module is implemented using OpenCV for real-time video processing. Facial detection algorithms are used to track:

- Eye contact consistency
- Facial expressions
- Head movement patterns

Each video frame is analyzed continuously, and behavioral metrics are calculated over the entire session. These values are stored temporarily and passed to the evaluation engine.

D. Speech Analyzer Implementation

The Speech Analyzer module uses speech recognition libraries for converting speech into text. The system evaluates:

- Speech clarity
- Tone variation
- Hesitation frequency
- Confidence level

Pause detection and filler word analysis help identify hesitation patterns. The system focuses on communication quality rather than content correctness.

E. Evaluation Engine Implementation

The Evaluation Engine integrates outputs from both behavioral and speech modules. It calculates:

- Confidence Score
- Communication Clarity Score
- Behavioral Stability Score
- Overall Performance Score

A weighted scoring mechanism is used to combine different metrics into a final performance score.

F. Report Generation Module

At the end of the session, the system generates a structured performance report. The report includes:

- Section-wise score breakdown
- Strengths and weak areas
- Personalized improvement suggestions

The report can be displayed on the screen and downloaded as a PDF for future reference.

V. Testing and Evaluation

Testing and evaluation were carried out to ensure that the MockMeUp system functions accurately, reliably, and efficiently during mock interview sessions. The system was tested under different scenarios to verify module performance, integration accuracy, and overall usability.

A. Functional Testing

Functional testing was performed to verify whether each module works according to its intended purpose. The following components were tested individually:

- User registration and login authentication
- Interview type selection (HR, Technical, Stress)
- Webcam and microphone activation
- Real-time video frame processing
- Speech-to-text conversion
- Score calculation and report generation

Each module was tested separately and then integrated to ensure smooth interaction between behavior analysis, speech analysis, and evaluation engine.

B. Behavioral Analysis Testing

The Behavior Analyzer was tested in different lighting conditions and camera positions to evaluate eye contact detection and facial tracking accuracy. The system successfully tracked head movement and basic facial expressions during mock interview sessions.

Minor variations were observed when lighting was extremely low, indicating that proper illumination improves detection accuracy.

C. Speech Analysis Testing

The Speech Analyzer was evaluated using different speaking speeds, tones, and accents. The system successfully detected:

- Hesitation frequency
- Tone variation
- Confidence level patterns

Speech recognition accuracy was higher in quiet environments and slightly reduced when background noise was present. However, the system still provided reliable feedback under normal conditions.

D. Performance Evaluation

Multiple mock interview sessions were conducted with students to analyze overall system performance. The evaluation engine successfully combined behavioral and speech metrics to generate structured performance scores.

Students reported that the feedback helped them identify weak areas such as frequent pauses, low eye contact, and monotone speech delivery. The generated performance report was easy to understand and useful for improvement.

E. System Efficiency

The system was tested for response time and processing efficiency. Real-time video and speech processing worked smoothly without noticeable lag on standard system configurations. The modular architecture ensured stable performance during multiple test sessions.

Overall, testing results indicate that MockMeUp provides reliable performance evaluation and meaningful feedback for interview preparation.

F. Results and Discussion

This section presents the results obtained after implementing and testing the MockMeUp system. Multiple mock interview sessions were conducted with students to evaluate the effectiveness of behavioral and speech analysis modules.

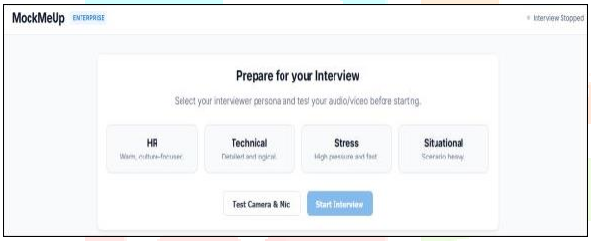

Fig. 2. Interview Persona Selection and Dashboard Interface

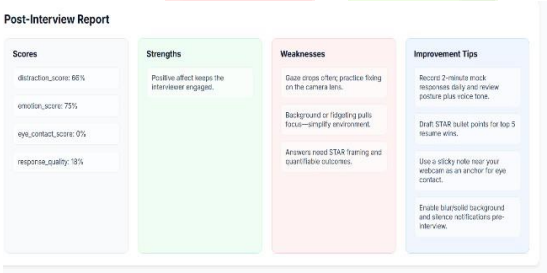

Fig. 3. Final Report and Recommendations

VI. Future Scope

Although the current version of MockMeUp provides structured interview evaluation using behavioral and speech analysis, there are several opportunities for further improvement and expansion.

In the future, the system can be enhanced by integrating advanced deep learning models for more accurate emotion detection and facial expression analysis. This would improve the precision of confidence and stress level measurement during interview sessions.

Another possible enhancement is the addition of AI-based question recommendation. Based on the user's performance history, the system could suggest customized interview questions to focus on weak areas. This would make the platform more adaptive and personalized.

The system can also be expanded to support multilingual interview analysis, allowing users to practice interviews in different languages. This would increase accessibility and usability across diverse user groups.

Cloud deployment is another important improvement. Hosting the system on a cloud platform would allow multiple users to access the system simultaneously and enable centralized data storage. It would also support scalability for institutional-level deployment.

Real-time analytics dashboards can be added for tracking performance trends over multiple sessions. Graphical reports showing improvement in confidence, hesitation reduction, and communication clarity over time would provide better insight to users.

In addition, a mobile application version of MockMeUp can be developed to allow students to practice interviews conveniently from smartphones.

Overall, these future enhancements would improve system accuracy, scalability, and user experience, making MockMeUp a more comprehensive AI-powered interview preparation platform.

VII. Conclusion

In this paper, we presented MockMeUp, an AI-powered interview preparation and behavioral analysis system designed to help students improve their interview performance. Many students face challenges such as nervousness, lack of confidence, poor eye contact, and unclear speech during interviews. The proposed system addresses these issues by providing structured feedback based on both behavioral and speech analysis.

MockMeUp integrates real-time video and audio processing frequency, and overall confidence level. The modular architecture ensures smooth interaction between the frontend interface, behavioral analyzer, speech analyzer, evaluation engine, and report generation module.

Testing results indicate that the system provides meaningful and measurable feedback that helps students identify weak areas and improve their communication skills over multiple sessions. The generated performance reports allow users to track their progress and focus on targeted improvements.

Overall, MockMeUp offers a practical and intelligent solution for modern interview preparation. The system not only enhances technical readiness but also improves confidence

and presentation skills, which are equally important for career success.

ACKNOWLEDGMENT

We would like to express our sincere gratitude to our project guide for their continuous guidance, encouragement, and valuable suggestions throughout the development of the Mock-MeUp system. Their support helped us improve our technical understanding and successfully complete this project. We also thank the Department of Computer Science and Engineering for providing the necessary facilities and academic environment to carry out this research work. The support and motivation from our faculty members played an important role in completing this project.

Finally, we extend our appreciation to our friends and classmates who participated in testing the system and provided constructive feedback, which helped refine and improve the overall performance of the application.

REFERENCES

[1] J. Smith and A. Brown, "Automated interview assessment systems: A survey," *Journal of Intelligent Systems*, vol. 15, no. 2, pp. 120-130, 2020.

[2] R. Kumar and S. Patel, "Speech analysis techniques for interview evaluation," *International Conference on AI Applications*, pp. 45-50, 2021.

[3] M. Lee et al., "Behavioral analytics in virtual interview platforms," *IEEE Conference on Smart Computing*, pp. 210-215, 2022.

[4] S. Sajjadiani, N. Kamat, and H. Aghajan, "Automated video interview analysis for personality assessment," in *IEEE International Conference on Automatic Face and Gesture Recognition*, 2019, pp. 1-8.

[5] A. Naim, M. Tanveer, and D. Gildea, "Automated prediction and analysis of job interview performance," *IEEE Transactions on Affective Computing*, vol. 11, no. 3, pp. 1-14, 2020.

[6] R. Subramanian, Y. Yan, J. Staiano, O. Lanz, and N. Sebe, "On the relationship between head pose, social attention, and personality prediction," *IEEE Transactions on Affective Computing*, vol. 4, no. 3, pp. 1-12, 2013.

[7] H. Nguyen and F. Gatica-Perez, "Hiring and personality in video inter- views: A multimodal analysis," *IEEE Transactions on Multimedia*, vol. 19, no. 4, pp. 859-873, 2017.

[8] A. Metallinou and S. Narayanan, "Annotation and processing of continuous emotional attributes: Challenges and opportunities," *IEEE Transactions on Affective Computing*, vol. 4, no. 2, pp. 1-16, 2013.

[9] S. Park, K. Shim, and J. Kim, "Speech-based confidence assessment in virtual interview systems," in *IEEE International Conference on Big Data and Smart Computing*, 2021, pp. 312-319.

[10] T. Baltrusaitis, C. Ahuja, and L. Morency, "Multimodal machine learning: A survey and taxonomy," *IEEE Transactions on Pattern Analysis and Machine Intelligence*, vol. 41, no. 2, pp. 423-443, 2019.