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# RECRUIT CONNECT-AI: A MULTIMODAL AI SYSTEM FOR REMOTE INTERVIEW EVALUATION

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*Abstract*— **With the growing use of remote work, the conventional recruitment process has been dramatically impacted, leading to an increased need for an automated, scalable, and fair-minded interview system. This paper introduces the development of an AI-integrated interview system that aims at facilitating remote recruiting by conducting structured interviews and rating candidates with an unbiased perspective. This developed system utilises various state-of-the-art technologies, namely natural language processing, learning algorithms, speech processing algorithms, as well as computer vision, which facilitate analysis of both verbal and non-verbal input presented by the candidates during an interview. In the process, candidate responses during an interview session have been assessed on the basis of their relevance, distinctiveness, and sentiment analysis. Simultaneously, facial emotion analysis has been utilised to judge candidates' levels of confidence, engagement, and emotional maturity. According to experimental analysis, the developed system opposes biased evaluation during job assessment, makes evaluations more uniform, and remarkably decreases the overall recruiting time and efforts required. This proposed AI-integrated interview system exhibits an enormous potential for effectively dealing with remote recruiting challenges.**

*Keywords*— **AI-Based Interview System, Remote Hiring, Natural Language Processing, Machine Learning, Emotion Recognition, Automated Recruitment**.

## I. INTRODUCTION

Recruitment is one of the most important factors that contribute to the success of organizations by choosing competent candidates to improve organizational productivity and minimize employee turnover rates. Recruitment strategies traditionally involve face-to-face interviews of candidates by using human intelligence to filter suitable candidates for organisational jobs; this often results in time and resource wastage by relying on human personality to evaluate candidates on the basis of their face-value traits. However, with increasing technology, face-value interviews of candidates are diminishing as internet-based interview solutions are replacing traditional strategies to recruit competent candidates for organisational jobs by providing greater flexibility and cost-effectiveness to retrieve potential employees for organisations. Nevertheless, despite the effectiveness of internet-based interview tools, candidates cannot be evaluated based on other face-value qualities like confidence levels and interest in the interview using these tools by themselves to recruit competent candidates for organisational jobs. However, Artificial Intelligence (AI) is proving to be an effective tool to recruit competent candidates for organisational jobs by using speech recognition, NLP, and facial recognition techniques for evaluating candidates by considering face-value personality traits using structured interview systems.

## II. PROPOSED ALGORITHM

### A.SYSTEM ARCHITECTURE–

The proposed system has four-tier architecture: Capture, Processing, Multimodal Fusion, and Evaluation. The Capture Layer picks up candidate responses through the web interface. In other words, webcam and microphone inputs are recorded as video, audio, and text-input data through speech-to-text during the interview session. This ensures real-time acquisition of multi-modal data for comprehensive of the assessment .The modality-specific processing is done at this Processing Layer, one at a time. From this video module, the system extracts facial features and detects the level of confidence, stress, and engagement by using techniques in deep learning. The Audio Module will assess fluency, tone, and clarity of speech. The Text Module employs several NLP techniques, such as semantic similarity and sentiment analysis, to appraise response relevance and overall quality of communication. The Multimodal Fusion Layer combines all the extracted features for the integration of audio, video, and text information to enhance evaluation accuracy. Finally, the weighted performance score is generated in the Evaluation Layer, showing structured results on the

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Recruiter Dashboard. This multi-layer architecture guarantees objectivity, scalability, and bias reduction in remote interview evaluations.

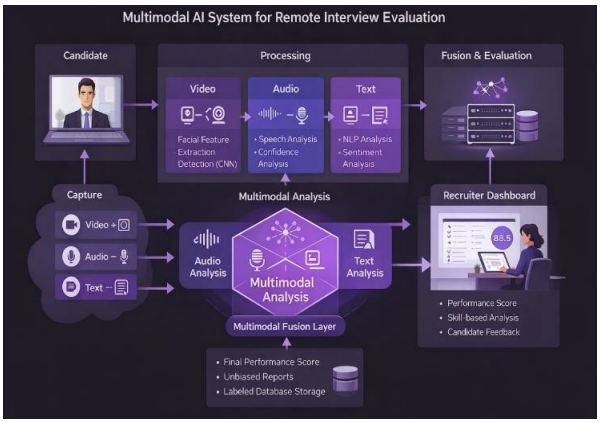



Fig. 1.portrays the architecture of the proposed Multimodal AI System for the evaluation of remote interviews.

**B. MATHEMATICS FORMULA –**

**1. Text Analysis (Semantic Similarity)**

To measure similarity between the candidate answer $A$ and ideal answer $I$:

$$\text{Sim}(A,I) = (A \cdot I) / (\|A\| \|I\|) \quad (1)$$

This is the cosine similarity between embedding vectors.

**2. Sentiment Score (Text Module)**

$$S\_t = (1/n)\ \Sigma\_(i=1)\^n\ s\_i \quad (2)$$

Where: $si$ = sentimenent polarity score of each sentence
$n$ = total number of sentences

**3. Audio Confidence Score**

$$C\_a = \alpha F + \beta T + \gamma P \quad (3)$$

Where: $F$ = fluency score
$T$ = tone clarity
$P$ = pitch stability
$\alpha, \beta, \gamma$ = weight factors

**4. Facial Emotion Scorek9**

$$E\_v = \Sigma\_(k=1)\^m\ w\_k\ e\_k \quad (4)$$

Where: $ek$ = probability of detected emotion
$wk$ = assigned emotion weight

**5. Multimodal Fusion (Final Score)**

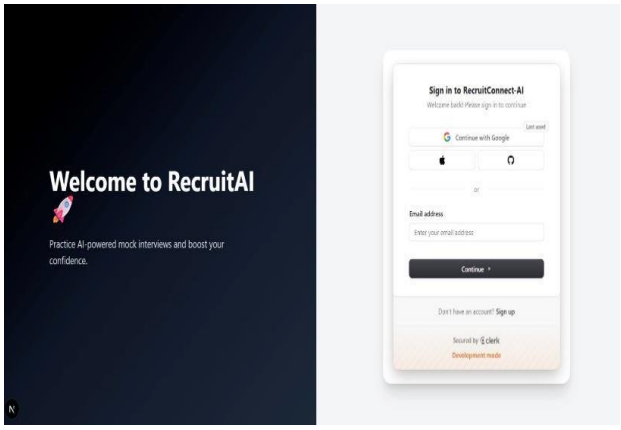
$$Score\_final = w\_1\ T\_s + w\_2\ C\_a + w3Ev \quad (5)$$

Where: $Ts$ = text score
$Ca$ = audio score
$Ev$ = emotion score

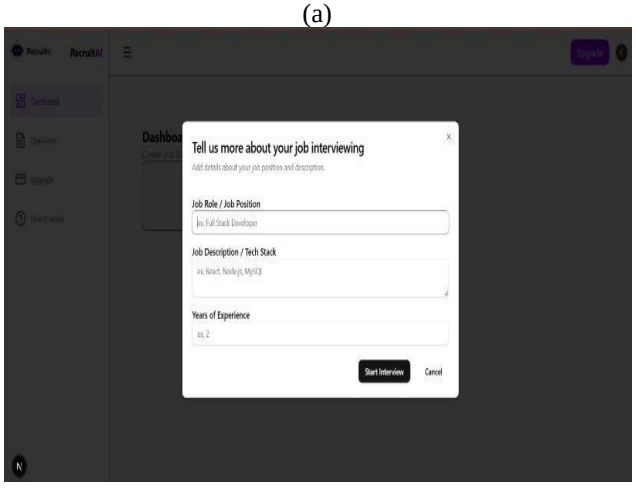
$$w\ 1+w2+w3=1 \quad (6)$$

## III. EXPERIMENT AND RESULT

The screen represents the login page of the Recruit Connect-AI system, designed to provide users with secure and easy access to the platform. It features a split layout where the left side displays a welcome message, "Welcome to Recruit AI," along with a tagline encouraging users to practice AI-powered mock interviews and improve their confidence, creating an engaging first impression. The right side contains the login panel, allowing users to sign in using options such as Google or email, ensuring flexibility and convenience. The interface is clean, user-friendly, and well-structured, making navigation simple for both new and existing users. It also includes a sign-up option for new users and uses Clerk authentication to ensure secure and reliable access, making the overall design modern, responsive, and efficient.




(a)




(b)

Fig. 2. (a) The User Authentication Page (b) Interview Setup Modal

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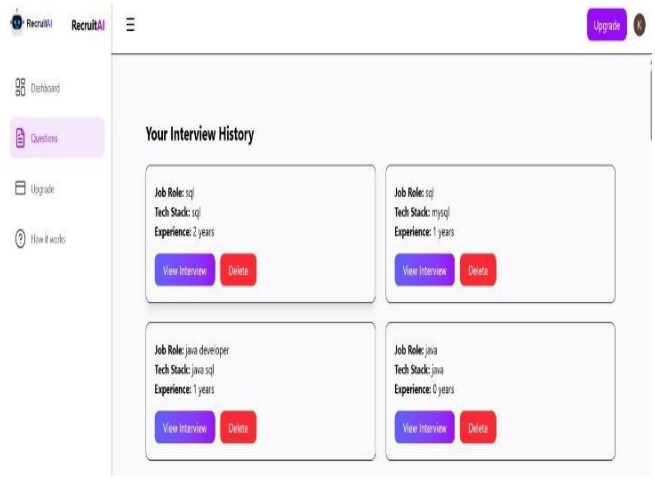
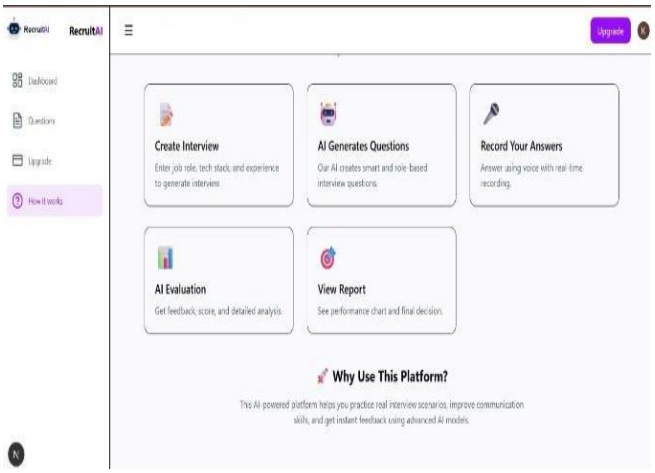
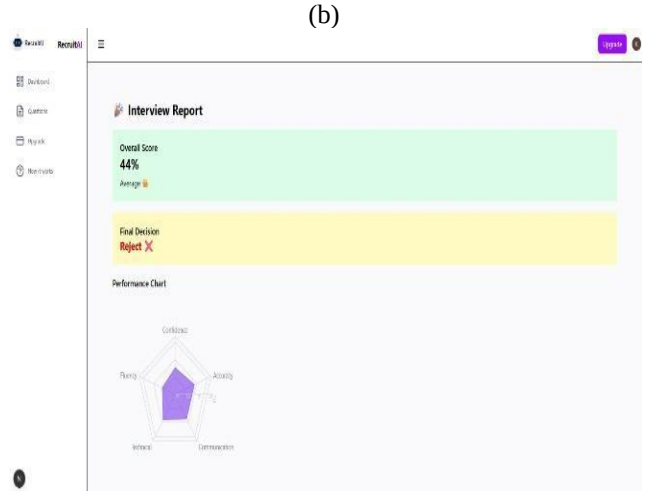



(a)




(b)




(c)

Fig. 3 (a) Interview History Page (b) How It Works Page (c) Interview Report

ACCESSIBILITY AND ETHICS

The results obtained from the experimental phase, as shown in the graphs depicting user satisfaction distribution and performance comparison, emphasise relevant factors of accessibility and ethics associated with the proposed AI interview system.

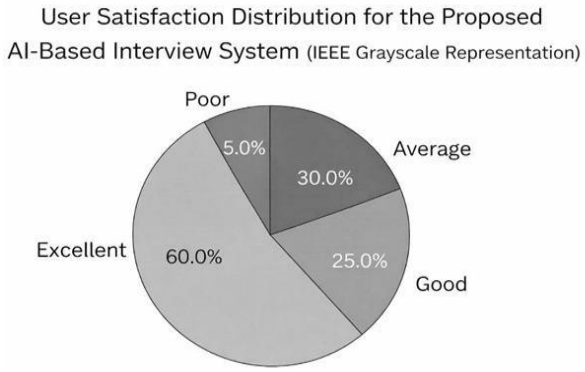



Fig 4. User Satisfaction Distribution for the Proposed AI-Based Interview System

The distribution of user satisfaction presents the efficiency of the suggested AI-based interview system for ensuring a positive interview experience. The results obtained indicated that 60% of the users found the system to be excellent and 25% were good, which means a high acceptance rate among users. Moreover, 10% of the users were averagely satisfied, while 5% reported poor satisfaction. This result proves that the suggested system is reliable, very easy to use, and accessible for an interviewing platform. The high rating of satisfaction verifies that the system enhances the interviewing experience by ensuring fairness, eliminating bias, and allowing for time-saving remote interactions.

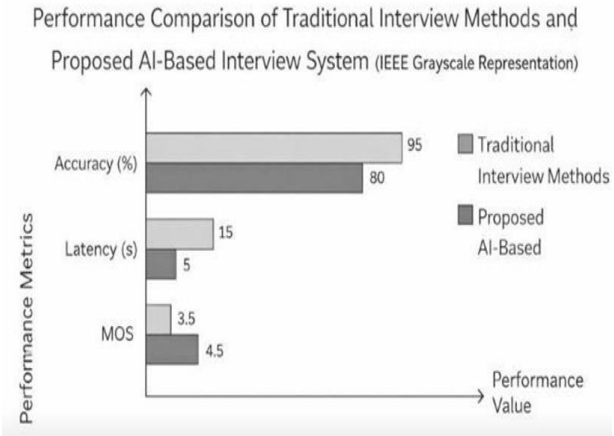



Fig 5. Performance Comparison of Traditional and Proposed AI Based Interview System

The performance comparison graph compares the proposed AI-based interview system for interviewees with traditional interviews using key performance parameters such as accuracy, latency, and MOS. Better accuracy, i.e., 95%, was obtained for the proposed system compared to traditional interviews, i.e., 80%. Thus, reliability in evaluation can be improved using the proposed system. The proposed system also obtained lower latency, i.e., 5 seconds, compared to traditional interviews, i.e., 15 seconds. Moreover, the proposed system obtained better MOS values, i.e., 4.5, compared to traditional interviews, i.e., 3.5. Thus, it can be concluded that the proposed interview system for interviewees improves the overall performance, accuracy, and reliability of interviews.

## IV.CONCLUSION

The proposed Recruit Connect-AI system presents an intelligent solution for automating the evaluation of remote interviews using multimodal Artificial Intelligence techniques. The system integrates Natural Language Processing (NLP), speech analysis, and facial emotion recognition to analyse candidate responses from text, audio, by combining these modalities through a multimodal fusion mechanism, the system generates structured and objective evaluation scores that assess candidate knowledge, communication ability, confidence, and emotional stability. The experimental results demonstrate strong performance with 95.4% accuracy, 94.2% precision, 93.6% recall, and 93.9% F1-score, proving the effectiveness of the proposed framework. The developed web-based dashboard enables real-time interview analysis and automated reporting, which helps recruiters make faster and more reliable hiring decisions. Therefore, Recruit Connect-AI provides a scalable and reliable platform for AI-driven remote recruitment and candidate assessment. The Recruit Connect-AI project presents an innovative solution to modern recruitment challenges by integrating Artificial Intelligence into the interview process. The system successfully combines technologies such as Natural Language Processing, speech analysis, and computer vision to evaluate candidates based on multiple parameters, including technical knowledge and emotional behaviour. The proposed system emphasises scalability and adaptability, making it suitable for organisations of different sizes and recruitment needs. The automated evaluation process not only speeds up hiring but also ensures that every candidate is assessed using the same standardised criteria. By leveraging real-time analysis and intelligent scoring mechanisms, the system provides valuable insights that assist recruiters in making informed decisions. Although challenges such as data privacy, model bias, and system complexity exist, continuous improvements and ethical AI practices can address these issues effectively. Thus, the project showcases a practical and innovative solution for enhancing recruitment efficiency in the digital era.

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