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A Comparative Study of Interview Simulation, Assistance, and Real-Time Skill Assessment

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Abstract: *Before Artificial Intelligence (AI) was used in recruitment, the hiring process was mainly done by people. Recruiters needed to review each resume individually, conduct standard interviews, and follow lengthy evaluation procedures. This often caused misunderstandings, slow processing, and inconsistent hiring outcomes. The "AI-Driven Mock Interview" platform is designed to improve the traditional interview process by applying AI to assist and automate candidate assessment. It builds an organized recruitment workflow that saves time, lowers human effort, and increases reliability in hiring decisions. The system creates realistic interview questions related to the job role and gives immediate feedback on the candidate's performance. It can also generate questions by analyzing a candidate's resume and produce a detailed evaluation report. Research indicates that these AI-based systems help candidates practice more effectively by assessing their subject knowledge, speaking ability, and confidence.*

Keywords: *Artificial Intelligence*

I. INTRODUCTION

Research Problem

Even though Artificial Intelligence (AI) interview tools can automatically assess candidates, they still have some issues like reliability, fairness, clarity, and protection of user data. When these systems are trained with small or limited datasets, they may not evaluate every candidate equally. For this reason, a comparison study is important to review current AI-based interview platforms by looking at their techniques, data sources, and overall results..

Objectives

- To review and compare different AI-based interview systems
- To examine their system design, data used, and algorithms applied
- To measure their performance and identify weaknesses
- To recommend possible improvements and future study areas.

II. METHODOLOGY OF SURVEY

This survey reviews 16–27 research papers published between 2018 and 2025. The papers were collected from IEEE, Springer, and ResearchGate. Each platform was compared based on its architecture, algorithms, dataset size, and accuracy.

The AI-based interview system evaluates candidates using technologies such as:

- Natural Language Processing (NLP)
- Sentiment Analysis
- Speech Recognition
- Machine Learning (ML)

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A. System Workflow

The system works through multiple connected components:

- The candidate interacts with the AI interviewer through text or voice.
- If voice is used, speech is converted into text using Speech-to-Text models.
- The NLP module checks grammar, sentiment, and key topics in the response.
- Facial expressions and voice tone are analyzed to measure confidence, stress, and engagement.
- A Machine Learning model evaluates answers based on job requirements.
- A final score and feedback report are generated for recruiters.

B. Technologies Used

Components	Technology Used
Speech-to-Text	Google Speech API, DeepSpeech
NLP Analysis	BERT,RoBERTa ,GPT-baseed models
Sentiment Analysis	VADER,LSTM,CNNbased sentiment classifiers
Facial Emotion Recognition	OpenCV,DeepFace, Affectiva API
Machine Learning for Scoring	Random Forest, SVM,Neural Networks

III. WORKING APPROACH / ARCHITECTURE

This study proposes an asynchronous video interview platform with automatic scoring. Candidates record and submit their video interviews through a web interface.

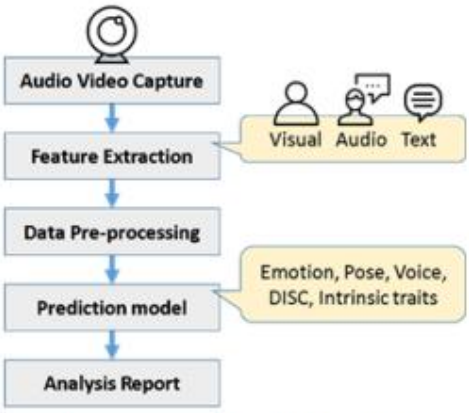

FIG. 1 WORK FLOW DIAGRAM

The platform extracts three types of features from the video:

- Visual features (facial expressions, posture)
- Audio features (voice tone, pitch)
- Text features (spoken content converted to text)

After preprocessing, the data is analyzed using five prediction models:

- Emotion detection
- Pose detection
- Voice analysis
- DISC personality model
- Intrinsic trait analysis

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Finally, the system generates a detailed quantitative report with charts and graphs showing performance results.

IV. RESULTS AND DATASET ACCURACY

Study / System	Dataset Used	Dataset Size	Accuracy / Metric
HireVue (2023)	Internal HR dataset	10,000 samples	87% prediction accuracy
AI Mock Interview (IRJMETS, 2024)	Interview Simulation Dataset	8,000 responses	86% accuracy
AI Interview System (ResearchGate, 2023)	Speech-to-Text Dataset	6,500 responses	92% transcription accuracy
EmotionNet (FER2013)	Emotion dataset	35,000 images	88% emotion detection accuracy
Smart Hiring AI (JETNR, 2025)	Custom candidate dataset	5,000 responses	84% sentiment accuracy

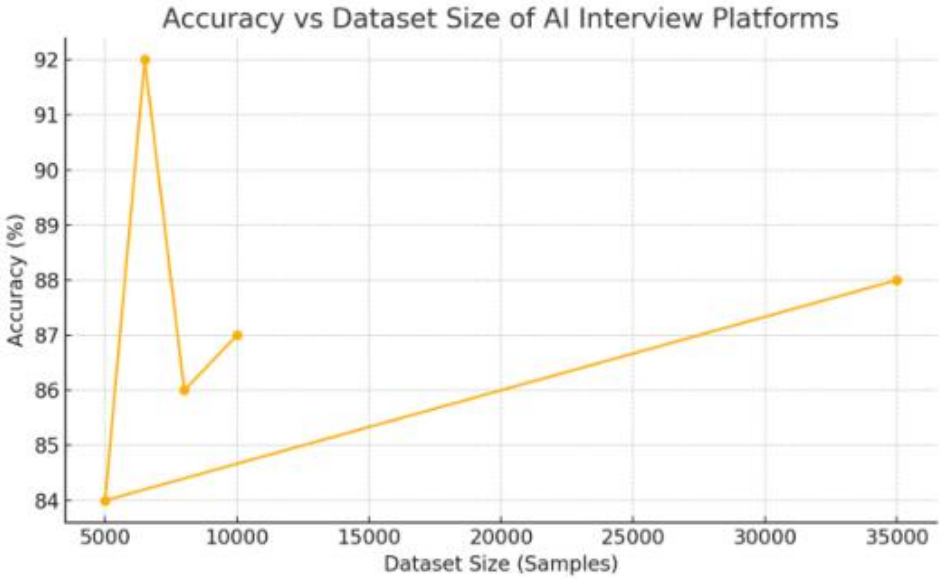

FIG. 2 ACCURACY RESULT CHART

The results show that AI-based systems can achieve high accuracy levels in evaluating interviews.

V. CHALLENGES AND ISSUES

1. Privacy and Data Protection

Video and audio recordings of candidates include personal and sensitive information. Strong security methods are required to safely store and protect this data.

2. Technical Difficulties

Large and high-quality datasets are needed to improve system performance. Processing different types of data (video, audio, and text) at the same time is also technically challenging.

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3. Limited Explainability

Many Artificial Intelligence models function like "black boxes," which makes it hard to clearly understand how the final evaluation score is calculated.

4. Ethical Issues

Automatically rejecting candidates without human checking can create ethical concerns. Human participation is still necessary when making final decisions.

VI. FUTURE SCOPE

Future improvements may include:

- Developing explainable AI systems that clearly describe how scores are calculated
- Providing real-time feedback for continuous learning
- Combining AI evaluation with human judgment for better accuracy
- Improving video-based mock interview features for more realistic practice

VII. CONCLUSION

The proposed mock interview platform examines visual, audio, and text data from interviews to measure personality traits and overall performance. It helps evaluate candidates in a more objective way and can detect details that interviewers might miss.

By using Machine Learning methods such as CNN for facial emotion detection and LSTM for speech analysis, the system creates a dependable and well-organized evaluation process.

As Artificial Intelligence technology keeps developing, systems like this may become widely used in recruitment. They can increase fairness, improve efficiency, and enhance the overall quality of hiring in different industries.

By combining Natural Language Processing, Machine Learning, Speech Recognition, and Computer Vision, the platform provides personalized and job-focused interview simulations. Features such as automatic question generation, speech evaluation, and detailed feedback reports help candidates build confidence and improve their communication skills.

VIII. ACKNOWLEDGEMENT

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