



AI-POWERED VOICE-BASED INTERVIEW SIMULATION SYSTEMS

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Abstract : Preparing for both technical and HR interviews remains difficult for many candidates, largely because there are not enough engaging and practical environments for realistic practice. Conventional mock interview setups rarely offer dynamic questions, adaptability, or instant feedback, which undermines their usefulness. However, with the recent growth in artificial intelligence and natural language processing, technology-based platforms are starting to provide more immersive and interactive interview practice options. This paper offers an in-depth analysis of current AI-powered interview tools, detailing their approaches, practical uses, and limitations. It further points out the need for scalable voice-based systems that can deliver adaptable questioning, evaluate spoken responses, and give candidates personalized insights. The research highlights a notable movement away from static testing toward more interactive and feedback-driven approaches designed to strengthen both technical knowledge and interpersonal skills.

IndexTerms - AI-based interview practice, natural language processing, speech assessment, interview questions

I. INTRODUCTION

In the current job market, acing an interview demands more than just technical knowledge; strong communication skills, adaptability, and self-assurance are equally important. Many individuals, particularly students and those new to the workforce, find it challenging to thoroughly prepare because real-world practice scenarios are often scarce. Conventional mock interviews frequently use text-based formats and miss the natural, spontaneous interaction that characterizes real interviews.

The introduction of artificial intelligence, natural language processing, and advanced language models has made it possible to develop sophisticated systems that replicate the feel of human interviews. These tools can evaluate candidates' spoken answers, adapt their questions based on performance, and offer immediate feedback for improvement. Especially, AI-powered voice interview simulators deliver accessible and lifelike practice sessions by providing engaging dialogue without the need for complex or expensive hardware, making realistic preparation opportunities widely available.

II. LITERATURE SURVEY

Recent studies indicate that artificial intelligence (AI) is increasingly being adopted to enhance mock interview training for both students and job seekers. Nagajyothi and Senthilkumar [1] (2023) utilized Convolutional Neural Networks (CNN) to identify personality traits during interview sessions, which significantly improves the accuracy and objectivity of candidate assessment by analyzing facial expressions and behavioral cues. Building on this, Senthilkumar et al. [2] (2025) proposed an NLP-based mock interview system capable of automatically generating interview questions and analyzing candidate responses in real time to provide constructive and personalized feedback. Furthermore, Marvaniya and Sarumathi [3] (2024) emphasized the role of AI-driven mock interview platforms in helping users repeatedly practice interview scenarios, thereby improving communication skills, boosting confidence levels, and reducing interview anxiety. Collectively, these studies demonstrate that AI-driven interview systems are evolving into more interactive, adaptive, and intelligent tools that effectively support continuous skill development and career preparedness.

table 1: Literature Review

Paper Title	Author(s)	Year	Key Focus	Applications	Challenges
AI Based Mock Interview System Using NLP	Senthilkumar et al.[2]	2025	Adaptive text-based interview simulation using GPT-T5 and emotion recognition	Text-based interview practice; emotion-aware feedback	No voice interaction; text-only feedback
AI-Enhanced HR Interview Simulation for Realistic Candidate Assessment	Sarumathi et al.[5]	2025	Personalized question generation +behavioral/emotional analysis	HR interview preparation; candidate evaluation	Complex multimodal analysis; not fully scalable
SYNCHRON AI Multiple Assistant AI Chatbot for Exam Prep	Chandrappa et al.[6]	2025	Adaptive personalized learning chatbot with analytics	Exam preparation; personalized learning	No real-time voice interview; limited to exam prep scenarios
Smart Prep AI-Based Interview Preparation System	Marvaniya et al.[7]	2025	Multi-agent chatbots for interactive interview practice;	Interactive interview preparation;	Limited to text/audio; AI may not simulate real
Talent Tracer AI Driven Interview Preparation Engine	Akshaya et al.[8]	2025	Multimodal candidate evaluation (text/audio/video), personalized feedback	Comprehensive interview prep; adaptive feedback	Very complex; high resource requirements; difficult for small-scale projects
AI-Powered Virtual Job Interview Simulator	Shivaji Rao et al.[9]	2025	Adaptive question evaluation with NLP, speech-to-text	Virtual interview practice; adaptive question generation	No customization for company/difficulty; text + basic speech only
AI-Based Mock Interview Application	Mythili K et al.[10]	2025	Sentiment-based real-time feedback using NLP	Candidate performance evaluation	Limited accuracy (~80%); not voice- interactive
From Practice to Perfection: AI-Driven Mock Interviews	Rupali Umbare et al.[3]	2024	Holistic assessment of technical and soft skills; emotion & posture detection	Soft skill & technical interview preparation	Requires camera; complex multimodal implementation
Automatic Personality Recognition in Interviews Using CNN	Nagajyothi et al.[1]	2023	Multimodal personality detection (audio + video + CNN)	Interview assessment; candidate personality evaluation	Complex, requires camera/audio hardware; not fully scalable for simple web platforms

Chatbot- based Interview Simulator	Laiq[4]	2020	Text chatbot for requirements engineering	Interview simulation for novice.	Lacks real conversation; text- only; limited realism
AI based engineering college recommendation portal	Heda et al. [11]	2025	AI-based college recommendation	Student guidance systems	Data reliability
Role of chatgpt in smart voice assistance	Jiddewar et al. [12]		ChatGPT-enabled voice assistance	ConversationAI	Privacy & latency

A review of “Automatic Personality Recognition in Interviews Using CNN” by Nagajyothi et al. [1] (2023) reveals that this work introduces a candidate assessment system that combines both audio and video signals using convolutional neural networks. The system analyzes not only vocal characteristics—such as tone, pitch, and pauses—but also interprets facial expressions and subtle gestures to evaluate aspects like confidence, engagement, and communication skills. This integrated approach offers a richer understanding of a candidate’s personality than methods relying solely on their verbal answers. However, the system’s reliance on high-quality audiovisual equipment and strictly controlled environments poses challenges for widespread or remote interview applications, limiting its scalability for routine interview preparation.

An analysis of “AI Based Mock Interview System Using NLP” by Senthilkumar et al.[2] (2025) shows that this study introduces a text-driven interview simulator that leverages the GPT-T5 model to generate relevant questions and evaluate answers, including feedback sensitive to emotional context. Users participate in mock interviews where each new question adapts to their earlier responses, creating a tailored experience that helps them practice and improve. Still, the system’s exclusive reliance on text limits its realism; without voice interaction, spontaneous conversation, or recognition of non-verbal cues, it isn’t able to build authentic speaking confidence or interpersonal skills that real interviews require.

A review of “Smart Prep: AI-Based Interactive Interview Preparation System” by Marvaniya et al.[7] (2025) demonstrates that this platform uses a multi-agent chatbot approach to deliver adaptive interview practice tailored to the context of each user. By utilizing advanced language models, the system creates dynamic interview questions, evaluates user responses in real time, and provides ongoing feedback aimed at enhancing the quality, fluency, and relevance of answers. While this approach supports greater engagement and helps with structured skill-building, it is primarily limited to text interactions and some basic audio features, lacking thorough analysis of vocal tone, speech patterns, or the expressive delivery found in real interviews.

III. RESEARCH METHODOLOGY

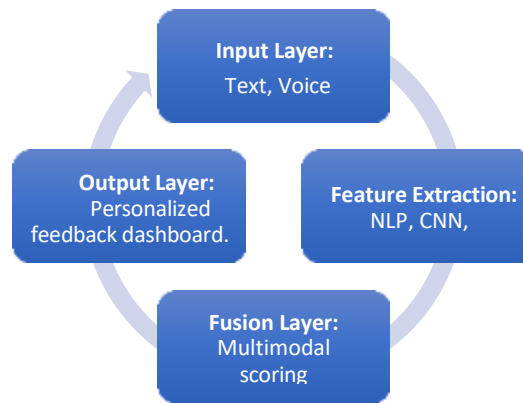


figure. 1

Typically, AI-driven interview platforms begin by capturing candidate inputs via either speech or text. These inputs are then analyzed to extract essential meanings and communication characteristics. The system evaluates the responses for their relevance, clarity, and overall quality, using this insight to select or generate the next question, ensuring the interview progresses naturally and adapts to the candidate's performance. Candidates are assessed on criteria such as correctness, depth of explanation, and communication effectiveness, followed by providing clear and actionable feedback to guide improvement. Additionally, all interaction data is recorded, enabling ongoing tracking of progress and supporting continuous skill enhancement through repeated practice sessions.

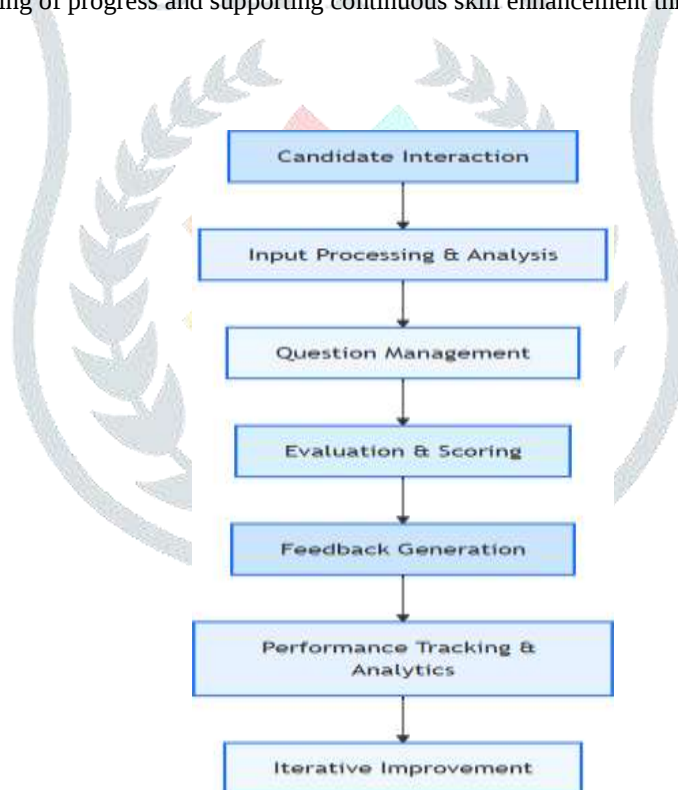


figure. 2

As depicted in Figure 2, the process starts when the candidate interacts with the system using supported input channels such as voice or text. The system receives this input and analyzes it to extract relevant information, context, and the key features required for evaluation. With a clear understanding of the candidate's response, the interview flow is managed by intelligently selecting or generating the most appropriate next question, ensuring continuity that is tailored to the candidate's previous answers. The system then evaluates each candidate response against important criteria, including accuracy, quality of explanation, communication style, and confidence. This thorough assessment covers both technical expertise and soft skills. After this step, candidates receive specific, actionable feedback that highlights both strengths and areas needing improvement. All responses and scores are logged to build a comprehensive performance record, which can be accessed as a progress dashboard for ongoing review. By repeating this cycle of feedback and practice, candidates progressively improve their interview skills in an iterative.

IV. FUTURE SCOPE

Looking ahead, AI-powered interview training platforms are poised to become even more lifelike and effective, emphasizing realistic voice-based interactions that closely mirror real interview scenarios. Efforts will likely center on developing advanced speech technologies capable of adapting to different accents and supporting multiple languages, thereby making these tools more inclusive for users worldwide. AI coaching agents could continuously guide candidates by learning from their progress and tailoring feedback accordingly.

Future versions are expected to combine generative AI capabilities with well-defined evaluation criteria, resulting in feedback that is both understandable and closely matched to actual interviewer standards. This should help bridge the gap between subjective human judgement and objective assessment. Beyond mock interviews, development may include features that address soft skills, specific industry requirements, and offer comprehensive analytics for tracking a candidate's growth over time. By prioritizing voice-driven user experiences and reducing the need for specialized equipment, these systems will improve accessibility, allowing learners from various backgrounds to benefit from robust and confidence-building interview practice.

V. CONCLUSION

AI-assisted interview platforms have advanced significantly, moving from basic text and voice formats to sophisticated multimodal solutions that integrate various assessment methods. Although these systems offer organized practice and meaningful feedback, issues such as scalability, instant adaptability, and dependence on specialized resources remain. Most platforms follow a workflow that includes engaging with candidates, analyzing their inputs, managing questions, evaluating responses, delivering constructive feedback, tracking progress, and supporting iterative skill development.

These findings underscore the importance of developing affordable, straightforward, and flexible interview preparation tools. Platforms need to provide genuine interview simulations, promote ongoing improvement, and supply tailored feedback, making it possible for users to train effectively without the burden of complicated setups or expensive technology.

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