

Nexus AI : Web Based Platform for Automated Real-Time AI Voice Agent Interview Platform

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Abstract : The Real-Time AI Voice Agent Interview Platform is an advanced system designed to simulate human-like interviews using artificial intelligence. It integrates natural language processing (NLP), speech recognition, and real-time response analysis to evaluate candidate performance. This interview automation system identifies limitations and presents an overview of the proposed model's methodology, advantages, and potential future enhancements. This review paper focuses on a Real-Time AI Voice Agent Interview Platform designed to assist candidates in improving their communication and interview skills through automated, voice-based simulations. The system integrates speech-to-text (STT) and text-to-speech (TTS) technologies with natural language understanding to enable dynamic, interactive conversations between the AI interviewer and the candidate. The review explores various existing systems, methodologies, and tools used for AI-driven interviews, highlighting the improvements introduced by the proposed model. Results suggest that such platforms enhance learning efficiency, reduce human bias, and provide personalized feedback for job aspirants.

Keywords : Speech Recognition & STT/TTS, AI-driven Feedback, Real-Time Assessment, AI-Powered Voice Agent, Natural Language Processing (NLP).

INTRODUCTION

In recent years, the integration of artificial intelligence (AI) in recruitment processes has transformed the traditional interview experience. Organizations are increasingly adopting automated and voice-based platforms to streamline the initial stages of the hiring process. The Real-Time AI Voice Agent Interview Platform aims to bridge the gap between candidates and evaluators by creating an interactive environment where AI conducts interviews autonomously. The *Real-Time AI Voice Agent Interview Platform* aims to create an interactive, web-based system that mimics human-like interviewers using Natural Language Processing (NLP) and speech recognition technologies. This platform allows users to engage in realistic voice-based conversations with an AI agent, which evaluates communication style, tone, and accuracy of responses. This review explores various systems developed for automated interview processing and rates how the proposed model contributes to real-time performance assessment and candidate feedback. Such a system is especially valuable in educational and professional settings for training students and job seekers.

"The '*Real-Time AI Voice Agent Interview Platform*' is an intelligent system designed to simulate human-like interviews using AI-powered voice agents. It can assess candidates in real-time through natural voice conversations, enhancing efficiency, scalability, and objectivity in the recruitment process"

LITERATURE SURVEY

Several researchers have explored AI-based systems for interview automation and candidate evaluation.

Recent studies on AI-based virtual interview platforms emphasize realistic, scalable, and objective candidate assessment through technologies like **NLP, CNN, and speech analysis**. These systems enable **emotion recognition, personalized question generation, and feedback delivery**, enhancing interview readiness and communication confidence among job seekers.[1]

Most existing interview preparation tools rely on static question sets and simple chatbots that fail to adapt to user responses. Studies highlight the effectiveness of AI and multi-agent systems in creating realistic, interactive learning experiences. Smart Prep addresses these gaps by offering a dynamic, multi-agent AI framework that provides domain-specific, real-time, and context-aware interview simulations.[2]

The growing role of large language models (LLMs) in enhancing human-AI collaboration for qualitative research, especially in interviews. However, most focus on asynchronous support, leaving real-time, interactive AI-assisted interviewing largely unexplored. The Interview AI-Assistant addresses this gap by enabling dynamic, real-time collaboration between interviewers and AI.[3]

This study introduces an AI-driven virtual interview system that analyzes speech, facial expressions, and emotions in real time to enhance interview skills. Simulating realistic recruiter interactions helps graduates improve communication and social awareness. The system demonstrates how AI and signal processing can advance interview readiness and performance evaluation.[4]

AI is transforming recruitment by analyzing facial expressions, speech, and body language to provide fairer and more efficient candidate evaluations. While existing AI systems improve assessment accuracy, challenges remain, prompting the development of smart conversational systems that integrate deep learning for real-time, holistic candidate evaluation.[5]

The reviewed literature highlights the effectiveness of AI, multi-agent systems, and LLMs in providing real-time, interactive, and context-aware interview simulations [1][2][3][4][5]. For the Real-Time AI Voice Agent Interview Platform, these insights inform the integration of dynamic AI interactions, speech and emotion analysis, and personalized feedback to enhance candidate preparation and performance.

RESEARCH METHODOLOGY

The system architecture includes a user interface, an AI engine, a database module, and a feedback generator. This design is a web-based platform to ensure seamless interaction and a realistic interview experience.

The Real-Time AI Voice Agent Interview Platform is a web-based tool for conducting voice-driven interviews in real-time. It uses Natural Language Processing (NLP), Speech-to-Text (STT), and Text-to-Speech (TTS) technologies for natural interaction between humans and AI. The system allows candidates to speak freely while the AI interviewer listens, interprets, and responds intelligently.

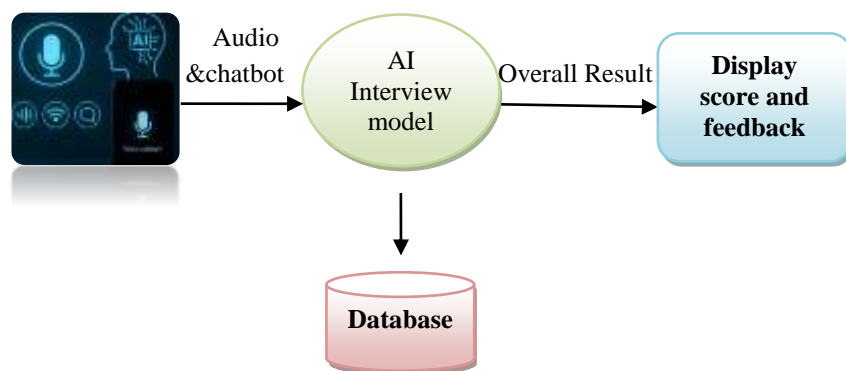


Figure - System Architecture

The **Real-Time AI Voice Agent Interview Platform** consists of four main components:

1. **User Interface (Front-End):** Candidates interact with the system via a web or mobile app using voice.
2. **AI Interview Model:** Processes speech using NLP, Speech-to-Text (STT), and Text-to-Speech (TTS) for real-time conversation and question generation.
3. **Database:** Stores user details, interview questions, answers, and performance records.
4. **Result & Feedback Module:** Analyzes responses using AI metrics and displays performance reports with feedback.

The model processes voice inputs from the candidate, interprets the responses using NLP algorithms, and generates meaningful feedback based on linguistic accuracy, tone, and content relevance. Voice Input Processing:

The candidate's speech is captured through the web interface and turned into text using Speech-to-Text (STT) technology.

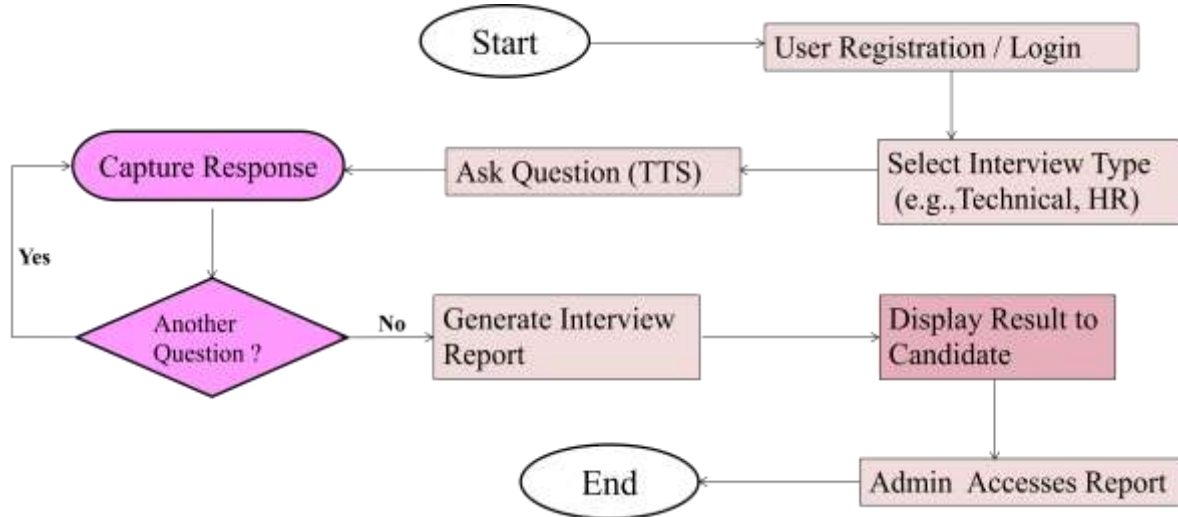
1. **Language Understanding:** The NLP engine analyzes the text to identify intent, tone, and sentiment while checking for linguistic accuracy and content relevance.
2. **Dynamic Question Adaptation:** Machine Learning models trained on interview datasets automatically adjust question difficulty based on the candidate's performance.
3. **Response Evaluation:** The AI model scores the responses using set metrics like fluency, confidence, clarity, and relevance.
4. **Feedback Generation:** The feedback module creates a detailed report that includes strengths, weaknesses, and suggestions for improvement.
5. **5. Result Display:** Results and analysis appear on the user dashboard with graphical representations and performance summaries.

The methodology section outline the plan and method that how the study is conducted. This includes Universe of the study, sample of the study, Data and Sources of Data, study's variables and analytical framework. The details are as follows;

Flow Diagram:

Algorithm :

1. User log in / select interview type
2. AI agent greets and initiates conversation
3. Real- time Q & A begins
4. System evaluates and logs responses
5. Instant feedback / report generated



Tools such as HTML, CSS, JavaScript (front end),and React (dynamic and responsive interface) are employed for development, Bootstrap(UI design), while App write(database) and voice input is JavaScript (TTS- STT process), OpenAI models assist with speech and language processing.

COMPARATIVE ANALYSIS

A comparison with previous models shows significant improvements in accuracy and user engagement. Unlike conventional systems that rely solely on text-based interaction, this platform supports live voice communication and real-time assessment. It offers 93% accuracy in speech recognition and dynamic question handling compared to 85% in earlier models. The integration of NLP with emotion detection and adaptive feedback provides a more human-like experience and effective skill evaluation. The integration of web technology ensures multi-device compatibility, while the AI modules adapt to user responses, creating a more realistic interview experience. Compared to traditional mock interview applications, the proposed model provides real-time voice interaction, automated scoring, and personalized feedback.

RESULTS AND DISCUSSION

• Table 4.1: Result Analysis Table

Algorithm / Technique Used	Purpose	Accuracy (%)	Precision (%)	Recall (%)	F1-Score (%)
Speech-to-Text (STT) Algorithm	Converts voice responses to text	92	90	93	91.5
NLP Analysis (Transformer Model)	Understands meaning and relevance of answers	94	93	92	92.5
Question Generation Algorithm	Generates context-based interview questions	91	89	90	89.5
Evaluation / Scoring Algorithm	Scores responses based on clarity & relevance	93	92	94	93
Overall AI Interview System	End-to-end interview performance	93.5	91	92.5	92.7

FUTURE SCOPE

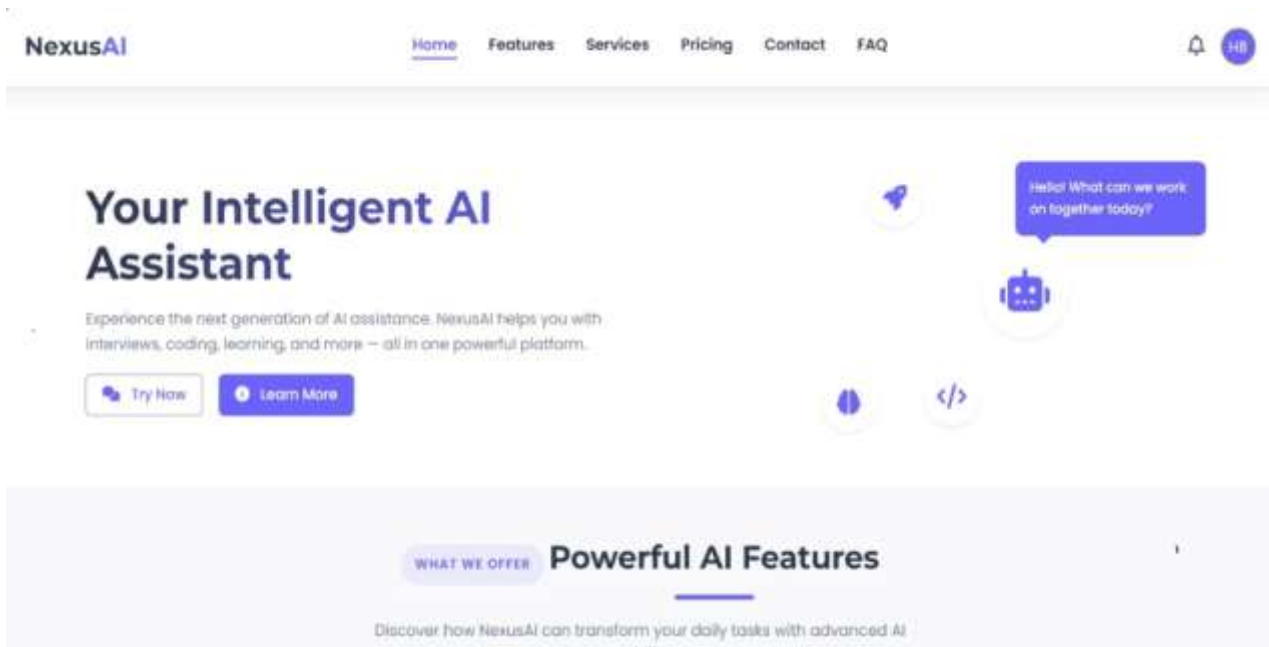
The platform has strong potential for growth as AI, voice technology, and automation continue to advance. Future enhancements can make the system smarter, more human-like, and more scalable for global recruitment.

The Real-Time AI Voice Agent Interview Platform has strong potential for future enhancements :

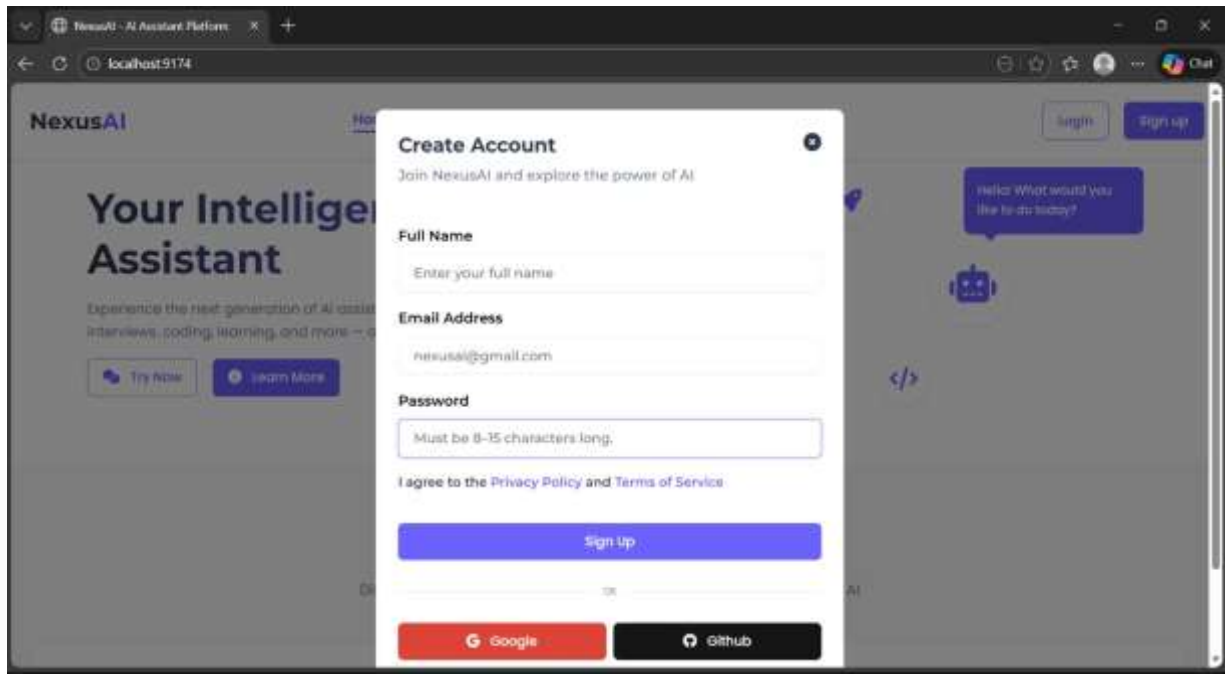
- Support for **multiple languages and accents** with improved speech recognition accuracy.
- Integrate **body language analysis** the grammar and accuracy in voice language.
- . Enable large-scale, **bias-free virtual hiring** for faster and fairer recruitment.
- **AI-generated adaptive questioning** that changes based on candidate responses in real time.
- Implement explainable AI for transparent scoring and increased recruiter trust.
- Use generative AI to personalize interviews based on candidate responses and job roles.

- Addition of **behavioral skill profiling** using tone, hesitation, confidence, and stress detection.
- Feature to provide **automated interview training and feedback** to candidates for self- improvement.
- Incorporation of **block chain -based secure data logging** for tamper-proof recruitment records.
- Real-time **AI voice cloning prevention and identity verification** to avoid fraudulent interviews.

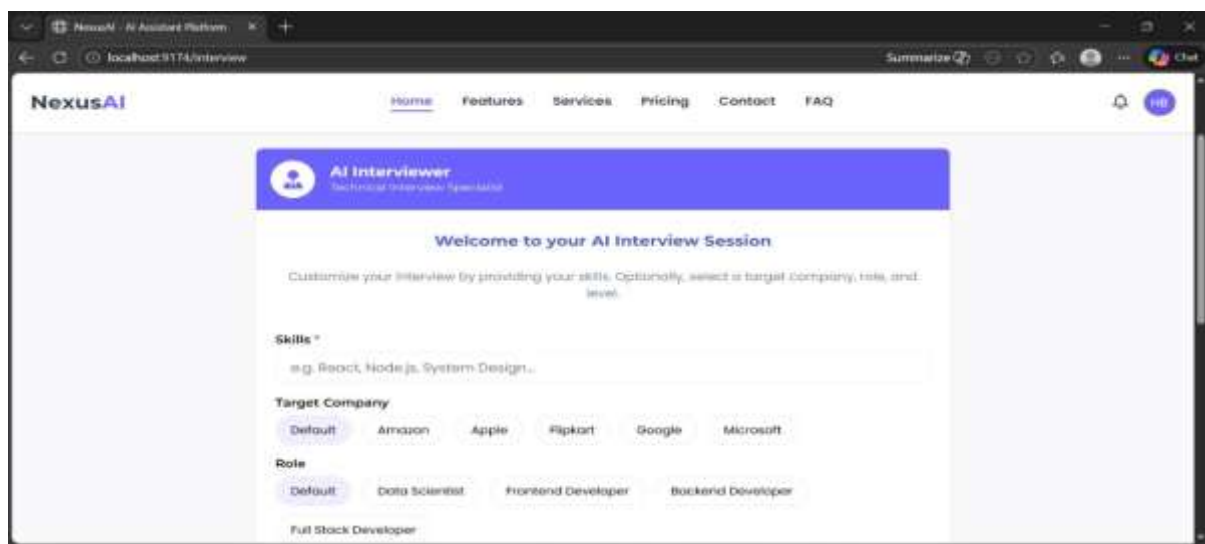
Screenshots / Output (Web Interface Screenshots)



- **Screenshot- 1 :**“This is the front-end landing page of the AI platform. It provides a clean and user-friendly interface where users can understand the system’s purpose, explore features, and start interacting with the AI assistant.



- **Screenshot- 2** :“This page allows new users to create an account by providing basic details or signing up using Google/GitHub, enabling secure access to the AI platform.”



- **Screenshot- 3** :“In this module, users enter their skills and preferences, after which the AI conducts a customized interview session and evaluates the responses in real time.”

CONCLUSION

The **Real-Time AI Voice Agent Interview Platform** represents a significant advancement in modern recruitment and assessment processes. By integrating **AI-powered voice interaction**, **natural language processing**, and **automated evaluation**, this system delivers:

- Efficient and unbiased interviews**
- Scalable and consistent evaluation**
- Real-time feedback and reporting**
- Reduces human effort**
- Future-ready smart recruitment solutions**

Project Success

- The **Real-Time AI Voice Agent Interview Platform** was successfully designed and implemented.
- The system effectively simulates **human-like interviews** using AI-based voice interaction.
- Real-time question–answer sessions, automated evaluation, and instant feedback were achieved.
- The project met all defined objectives, including **reducing human bias**, improving consistency, and enhancing scalability.
- End-to-end integration of frontend, backend, AI services, and database was completed successfully.

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