

Agentic AI In Interview Automation

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Abstract - Recruitment is a very crucial process for any organization because recruiting the right candidate directly influences productivity and growth. However, traditional interview methods have several drawbacks, including human bias, being time-consuming, not easily scalable, and lacking standardized candidate evaluation. Online interviews have recently become common with remote hiring, but they introduce their own set of challenges like impersonation, cheating, and no real-time monitoring. Recent developments in Artificial Intelligence have allowed for intelligent systems capable of executing complex decision-making tasks autonomously. Agentic AI-a goals-oriented branch of AI that focuses on the self-directed behavior of autonomous entities-has already seen considerable success across health, robotics, and autonomous systems. Drawing inspiration from the success of Agentic AI in healthcare decision-making, this research investigates its application in recruitment. This paper introduces IntelliHire-an Agentic AI-powered interview automation platform that independently conducts interviews, evaluates candidates fairly, and ensures integrity in the interview process. It aspires to minimize human interaction while offering a professional, adaptive, and humanlike interview experience

Key Words: Agentic AI, Interview Automation, Intelligent Recruitment, Voice-Based AI, Adaptive Questioning, Cheating Detection, Autonomous Decision-Making

1. INTRODUCTION

Recruitment is one of the most important activities in any organization because the quality of employees directly affects productivity and business success. Traditional hiring methods mainly depend on human interviewers to screen resumes, conduct interviews, and evaluate candidates. This process is time-consuming, costly, and often influenced by human bias, fatigue, and inconsistency. When companies receive a large number of applications, it becomes difficult to fairly and accurately assess every candidate. With the growth of Artificial Intelligence (AI), many parts of the recruitment process have been automated. AI-based resume screening, chatbots, and online assessments are now commonly used to reduce manual work. However, most existing systems follow fixed rules or predefined question sets. They do not behave like a real interviewer who adapts questions based on the candidate's answers, confidence, and performance. As a result, such systems fail to fully understand a candidate's true ability and potential. Agentic AI is an advanced form of artificial intelligence that can act autonomously, make decisions, remember past interactions, and adapt its behavior based on goals and feedback.

Unlike traditional AI systems, Agentic AI can plan, reason, and modify its actions during interaction. This makes it highly suitable for interview automation, where continuous decisionmaking and adaptability are required. This project proposes IntelliHire, an Agentic AI-driven intelligent interview system that conducts human-like interviews through voice and text interaction. The system dynamically selects questions, evaluates candidate responses in real time, and adjusts the difficulty level based on performance. It also generates structured evaluation reports for recruiters, helping them make fair and data-driven hiring decisions. By combining natural language processing, speech recognition, adaptive questioning, and autonomous decision-making, IntelliHire aims to create a smarter, more efficient, and unbiased recruitment process compared to traditional interview methods.

2. LITERATURE REVIEW

Artificial Intelligence (AI) has recently become widely used in recruitment and human resource management. Many organizations now use AI-based tools for tasks such as resume screening, candidate shortlisting, and initial evaluation. The main purpose of these systems is to reduce human effort and improve recruitment efficiency. However, most existing solutions operate based on predefined rules or fixed models, which limits their ability to understand and adapt to individual candidate behavior.

Several studies have explored AI-driven interview platforms that use chatbots or automated question-and-answer mechanisms. These systems rely on Natural Language Processing (NLP) to interpret candidate responses and assist in automating interview processes. However, they generally do not modify their questioning strategies according to the candidate's performance, which limits their effectiveness in evaluating complex abilities such as communication, problem-solving, and emotional intelligence.

Voice-based interview systems have also been explored in recent research. These systems use speech recognition technology to allow candidates to respond verbally, creating a more natural interview environment. Some systems are capable of analyzing tone, speaking speed, and confidence level to assess soft skills. However, most of these platforms mainly record and transcribe responses without adapting the interview process dynamically based on candidate responses.

Other research efforts have introduced AI-powered interview systems that generate evaluation reports using machine learning techniques. These systems assign scores to technical knowledge, communication skills, and behavioral traits.

While these approaches help recruiters in decision-making, they still rely on static question sets and lack dynamic adaptability during the interview process.

From the existing literature, it is evident that although AI has improved recruitment efficiency, most systems still lack autonomy, adaptive intelligence, and memory-based decision-making. Therefore, there is a need for an intelligent system capable of conducting interviews dynamically while evaluating candidates in real time.

3. Technology used in AI Interview Agent System Software used:

VS Code:

A free, open-source code editor developed by Microsoft. It is used to write, edit, and debug code efficiently and supports many programming languages with extensions.

Python (Django Framework):

Django is a high-level Python web framework used to build secure and scalable backend systems. It helps in handling APIs, authentication, database management, and server-side logic.

Django REST Framework:

A powerful toolkit for building Web APIs in Django. It is used to create RESTful APIs that allow communication between the frontend interface and backend services.

Groq API (Llama 3 Model):

Groq provides ultra-fast inference for AI models. The system uses the Llama-3 model through the Groq API to generate interview questions and responses in real time.

Anthropic Claude AI

Used for intelligent resume parsing. It extracts structured information such as skills, experience, and education from uploaded resumes.

PyPDF2:

A Python library used to extract text from PDF resumes uploaded by candidates during the interview process.

python-docx:

A Python library used to read and extract text from DOCX resume files.

HTML5:

Used to design the structure of the web interface where candidates interact with the interview agent.

CSS3:

Used to style and improve the appearance of the interview platform user interface.

JavaScript (Vanilla JS):

Used to handle frontend logic such as user interactions, event handling, and communication with the backend APIs.

Web Speech API:

A browser-based API used for speech recognition and speech synthesis. It converts candidate voice input into text and enables the AI agent to communicate using voice.

Anti-Cheating Monitoring System (JavaScript Events):

Custom JavaScript listeners detect suspicious behaviors such as tab switching, copy-paste attempts, or browser focus loss to prevent cheating during interviews.

OpenPyXL:

OpenPyXL is a Python library used to read and write Excel (.xlsx) files. In the system, it is used to fetch candidate email IDs from an Excel sheet and process them for sending bulk interview invitations.

4. Proposed System

Improvements Over the Existing System:

• **Agentic AI-Based Interview Automation**

The system uses Agentic AI to conduct interviews autonomously by analyzing candidate responses and dynamically controlling the interview flow.

• **Adaptive Question Generation**

The AI interviewer generates follow-up questions based on the candidate’s resume, previous responses, and skill level to create a more personalized interview experience.

• **Voice-Based Human-Like Interaction**

The platform supports real-time voice communication using speech recognition and text-to-speech technologies, enabling natural conversation between the AI interviewer and candidates.

• **Real-Time Candidate Evaluation**

The system analyzes candidate responses using Natural Language Processing and generates scores based on technical knowledge, communication quality, and response relevance.

• **Cheating and Malpractice Detection**

The platform detects suspicious activities such as tab switching, window blur, or unauthorized actions during the interview to maintain fairness and authenticity.

• **Automated Interview Report Generation**

After completing the interview, the system automatically generates detailed evaluation reports and candidate rankings for HR decision-making.

Unlike the existing systems, our system includes the following roles:

1. **Admin Panel:**
Manages the overall system, user accounts, and access permissions.
2. **HR / Recruiter Panel:**
Uploads candidate details, schedules interviews, and reviews evaluation reports.
3. **AI Interview Agent:**
Conducts the interview autonomously, asks questions, evaluates responses, and adapts the interview flow dynamically.
4. **Candidate Panel:**
Allows candidates to join interviews through secure links, interact with the AI interviewer, and complete the interview process.

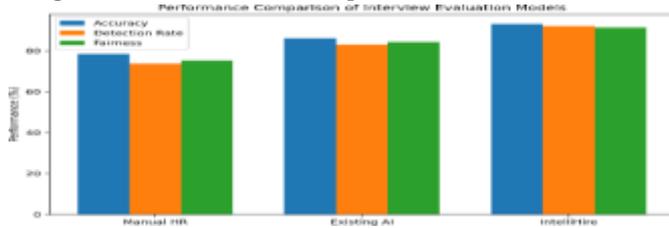
Table -1: PERFORMANCE METRICS FOR AI-BASED INTERVIEW EVALUATION

Method	Accuracy (%)	Precision (%)	Recall (%)	F1-Score (%)
Traditional HR Interview	78.4	75.2	73.8	74.5
Existing AI Interview Tools	86.1	84.3	82.9	83.6
Proposed IntelliHire Agentic AI	93.2	91.4	92.1	91.7

Table -2 PERFORMANCE METRICS FOR REAL-TIME INTERVIEW MONITORING

Metric	Detection Rate (%)	Alert Accuracy (%)	Response Time (sec)
Tab Switching	97.5	96.8	2.4
Eye-Away Detection	94.2	93.6	2.7
Face Mismatch	96.1	95.3	2.2
Microphone Muting Abuse	95.4	94.7	2.6

Figure 4.1 : Performance comparison



5. Challenges Faced During Implementation

AI Model Integration

Integrating large language models and AI APIs into the system required careful handling of response latency and prompt design to ensure accurate interview question generation.

Voice Processing and Speech Recognition

Implementing real-time speech-to-text and text-to-speech interaction was challenging due to variations in voice clarity, accents, and background noise during interviews.

Real-Time Monitoring for Cheating Detection

Developing browser monitoring features such as tab-switch detection, window blur tracking, and activity logging required handling multiple browser events efficiently.

Emotion and Behavior Analysis

Detecting candidate emotions and attention levels using computer vision techniques required integrating libraries such as OpenCV and MediaPipe while maintaining real-time performance.

Secure Candidate Authentication

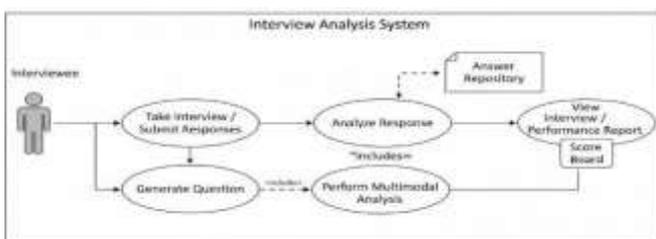
Ensuring that only authorized candidates attend the interview required implementing secure login mechanisms and unique interview invitation links.

System Performance and Response Time

Handling real-time AI processing, speech recognition, and behavioral analysis simultaneously required optimizing backend processing and API communication.

6. System Design

6.1. Architecture of the System



6.2 Module Include

Admin Panel

- Manage company registration and system access.
- Create and manage HR accounts.
- Manage subscription plans and company details.
- Monitor overall interview activity.

HR Panel

- Schedule interviews and send invitation links to candidates.
- Monitor live interview sessions and malpractice alerts.
- View AI-generated candidate rankings.
- Access interview reports and recordings.

Candidate Interface

- Join interviews using secure invitation links.
- Interact with the AI interviewer through voice and text.
- Complete technical questions and coding tasks.
- Submit responses and receive automated evaluation.

7. Implementation and Results

7.1 System Development

The **IntelliHire** system was developed as a web-based application using modern front-end and back-end technologies. The main aim of the system is to automate and simplify the interview process using artificial intelligence. The system comprises the following modules:

Admin Panel:

Manages company registration, user creation, and system access control.

HR Panel:

Allows HR users to schedule interviews, send invitation links, and monitor interview progress.

Candidate Interface:

Candidates attend the interview through a secure link and interact with the AI interviewer using voice and text.

AI Interview Agent:

Automatically generates interview questions and evaluates candidate responses using AI.

Malpractice Detection:

Detects suspicious activities such as tab switching or window changes during the interview.

Voice Interaction:

Enables real-time communication between the AI interviewer and the candidate using speech technologies.

Evaluation and Report Generation:

Generates candidate performance scores and detailed interview reports automatically.

7.2 System Testing

To ensure system reliability and performance, the following testing strategies were used :

Unit Testing:

Individual modules such as login, interview scheduling, and evaluation were tested separately.

Integration Testing:

All modules were combined and tested to ensure proper communication between system components.

User Acceptance Testing:

The system was tested with sample users to verify usability and overall functionality.

Results:

The system responded effectively during test interviews. AI-generated interview questions were displayed and processed correctly. Voice interaction and candidate response evaluation worked successfully. Malpractice detection and candidate scoring were generated as expected.

7.3 Results :

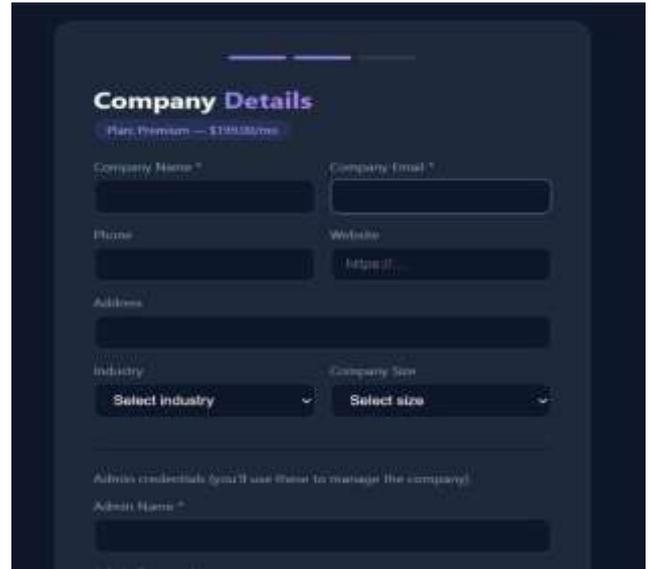


Fig 7.3: Company Register Page

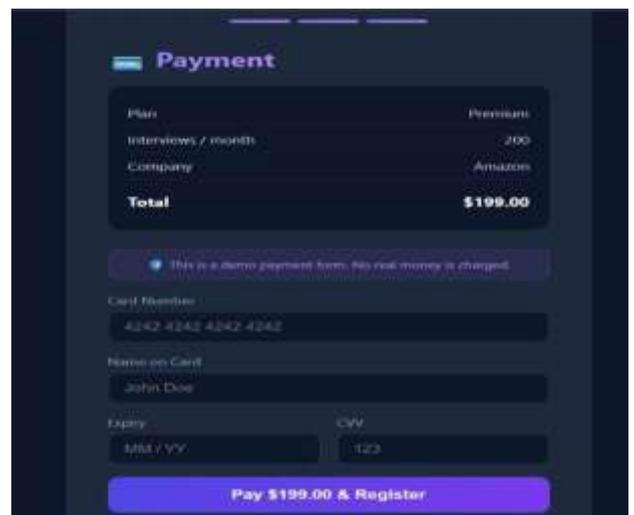


Fig 7.4: Payment Page



Fig 7.1: Home



Fig 7.2: Subscription

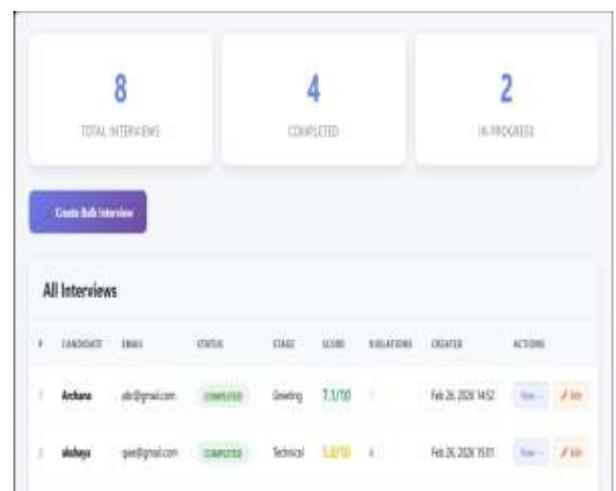


Fig 7.5: HR Page

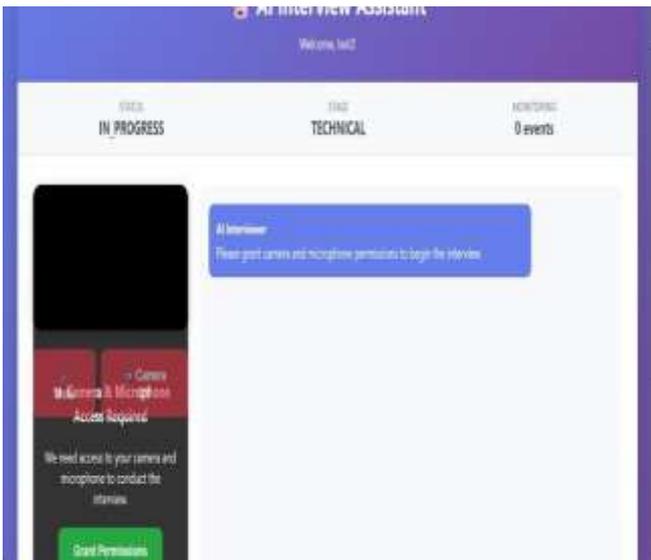


Fig 7.6: Candidate Page

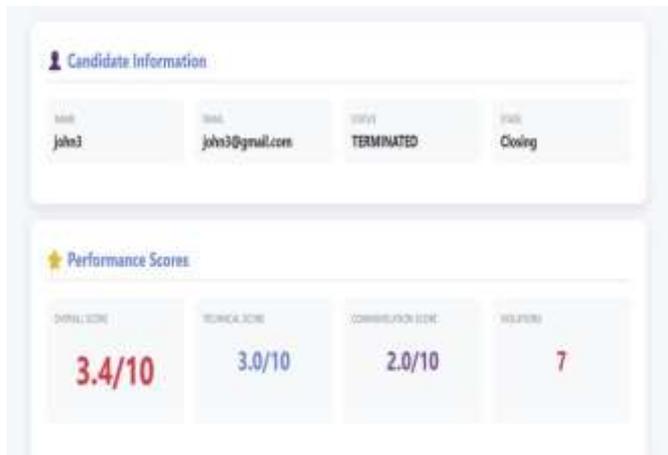


Fig 7.7: Candidate Information Page

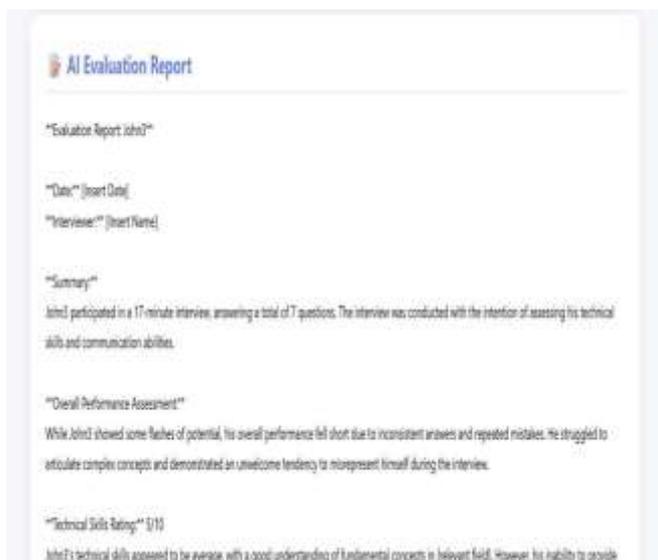


Fig 7.8: Candidate Report Page

8. DISCUSSION AND ANALYSIS

8.1 Advantages of IntelliHire System

Automated Interview Process

The system conducts interviews automatically using an AI agent, reducing manual effort by HR teams.

Reduced Human Bias and Scalable Recruitment

AI-based evaluation ensures fair and consistent candidate assessment. The platform can handle multiple interviews simultaneously, making it suitable for large-scale recruitment.

Real-Time Candidate Evaluation

Candidate responses are analyzed instantly using AI and NLP techniques.

Voice-Based Interaction

Speech-to-text and text-to-speech technologies enable natural communication between the AI interviewer and candidates.

Malpractice Detection

The system detects suspicious activities such as tab switching or window changes during interviews.

8.2 Future Work

Integration of advanced AI models for better interview analysis. Improved emotion and behavior detection. Integration of real time coding assessment tools. Enhanced user interface and experience. Deployment on cloud platforms for large-scale recruitment

9. ACKNOWLEDGEMENT

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10. CONCLUSION

The proposed IntelliHire – Agentic AI Based Interview Automation System provides an intelligent and efficient solution for modern recruitment processes.

The system automates the interview process by integrating artificial intelligence, voice interaction, and real-time candidate evaluation within a web-based platform. By improving efficiency, fairness, and scalability, the system simplifies interview management, candidate assessment, and report generation. The AI-driven interview agent dynamically generates questions and evaluates candidate responses, ensuring consistent and unbiased evaluation. The system also enhances security through malpractice detection mechanisms such as tab-switch monitoring and activity tracking. Through its role-based access, IntelliHire improves coordination between administrators, HR personnel, and candidates while maintaining organized interview records and performance reports. This enables faster recruitment decisions and more accurate candidate evaluation. Overall, IntelliHire demonstrates the potential of Agentic AI in transforming traditional interview methods into a more automated, transparent, and efficient hiring process. The system provides organizations with a reliable platform for conducting scalable and data-driven recruitment in modern digital environments.

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