

Informatics Institute of Technology

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Software Development Group Project

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CS - 75

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Interview Suite

1. Problem

1.1 Introduction to problem

There is a significant challenge for both employers and job seekers due to the competitive job market. Most job seekers face difficulties when preparing for interviews in ways that meet the expectations of the hiring managers. This lack of preparation can often lead to missed opportunities, which in turn increases candidates anxiety and reduces the success rate. Employers on the other hand are tasked with screening numerous candidates in interview rounds, this process takes up a substantial time and resources which in turn causes delays in hirings.

1.1.1 Problem background and stats

Interview Preparation Challenges for Job Seekers :

- **Statistics on Interview Anxiety:**

Most people feel nervous when they have a job interview.
Some studies show that about 90% of people get worried and this can affect how well they do.

- **Failure Rate in Initial Interviews:**

Half of all job seekers don't make it past their first interview.
This usually happens because they either don't communicate well enough
Or the job isn't what they thought it would be.

- **Preparation Gaps:**

Studies show that many people don't feel ready for interviews where they
Have to talk about how they handle different work situations. Only 4 out of
10 people spend a lot of time working on people skills like communication
and teamwork.

Hiring Challenges for Employers:

- **Screening Time and Costs:**

Finding and interviewing new workers costs companies a lot of money. If they hire the wrong person, it's very expensive, about one third of what they would pay that worker in their first year.

- **Manual Evaluation Limitations:**

More than half of people in charge of hiring say they have trouble judging how good candidates are at things like teamwork and communication. This is because they don't have enough time to check these skills properly.

1.1.2 Examples in the problem

According to the Society for Human Resource Management (SHRM), the average cost per hire has significantly increased over the past few years, rising from \$4,129 in 2019 to \$4,700 in 2023—a 14% increase. This already high cost can escalate even further depending on the role, particularly in fields experiencing critical talent shortages. Positions in cybersecurity, engineering, and nursing, for example, often demand specialized skill sets that make hiring more competitive and costly. In executive-level hiring, the expenses are even steeper; SHRM reports an average cost per hire of \$28,329 for these roles due to the additional complexities involved in executive recruitment (*The True Cost of Hiring an Employee in 2024 • Toggl Hire, 2024*).

Moreover, LinkedIn's Global Talent Trends report highlights that over 65% of job candidates express a strong preference for feedback on their interview performance, especially regarding essential skills like communication and emotional intelligence. This feedback not only helps candidates improve but also fosters a more engaging and supportive recruitment experience, aligning with the growing expectations for a fair, transparent hiring process.

1.1.3 Attempted solutions of the Competitors

Features	Interview Suite	<u>BarRaiser</u>	<u>Imocha</u>	<u>LoopCV</u>	<u>HireVue</u>
<ul style="list-style-type: none"> Feedback on Candidate Performance 	Yes	No	No	No	No
<ul style="list-style-type: none"> AI-Driven Mock Interview Partner 	Yes	No	No	No	Yes
<ul style="list-style-type: none"> Gamified Interview Preparation 	Yes	No	No	No	Yes
<ul style="list-style-type: none"> Body Language and Posture Analysis 	Yes	Yes	No	No	Yes
<ul style="list-style-type: none"> Candidate-Employer Matching Feature 	Yes	No	No	Yes	No
<ul style="list-style-type: none"> Dynamic Question Generation 	Yes	No	Yes	No	No

2. Proposed Solution

The proposed solution is an AI-powered interview platform designed to enhance candidates' interview skills while offering employers an efficient tool for conducting initial interview screenings. By leveraging advanced voice and body language analysis by using pre-trained models, the platform provides insights into candidates' soft skills, interview readiness and finding a job fit.

1. For job seekers,

1. Voice analysis for confidence and clarity:

This model will capture and rate the confidence of the candidate, check the clarity of the voice and will improve the communication from speech to text and voice analysis model. Through the vocal analysis, the platform assesses emotional expression to provide feedback on emotional engagement.

2. Body language and posture:

By utilizing pre-trained body language models with webcam input, the platform will track eye contact, facial expression and overall engagement.

3. Personalized feedback and progress tracking:

This platform will set specific goals and provide tailored feedback to track progress of the overall interview.

2. For employers,

1. Scoreboard and shortlisting:

Compiling a comprehensive score board based on interview performance, CV alignment from the overall interview progress.

2. Job matching and Vacancy direction:

This platform will be using its skills to gather data to match and shortlist with suitable job openings, allowing employers to connect with high fit candidates.

3. Target Audience

1. For People Who Looking for Jobs:

- It's like having a personal Interview trainer at your end.
- Candidates can be interviewed whenever they want.
- Like a fitness app, but for getting better at interviews.

2. For Companies Hiring people:

- Helps spot good candidates early.
- Companies can save time or money on wrong hires.
- It's like having an extra helper to check job candidates.

Basically, It's like a bridge that helps both sides of job seekers practice until they feel confident and companies can find good workers more easily. This app helps win both parties because job seekers are better prepared and companies spend less time finding the right candidates.

4. Resource Requirements

- Hardware requirements
 - Laptop/Smartphone - To access the web application.
 - Webcam - To access the camera and analyze the video footage
 - Microphone - To have a conversational interaction with the application and for analyzing purposes.
- Software requirements
 - Operating System
 - Development Tools - IDE's such as IntelliJ, VSCode
 - Databases
 - Machine Learning Frameworks

- Frontend Technologies
 - React - A powerful javascript library that can be used for building interactive UI , which allows for dynamic question generation and real-time feedback for the candidates.
 - Redux - For state management (handling interview questions, user data)
 - Axios - A HTTP client for making API requests to the backend.
 - Bootstrap or Tailwind CSS - To create visually appealing designs and a friendly user interface.
 - CodeMirror or HackerRank API - To provide a code editing platform for the coding questions (will be finalized during the CW).
 - Web Speech API - Used for text to speech which allows a conversational interaction.

- Backend Technologies
 - Django - A high level python framework ,comes built in with ORM,
 - Authentication and admin interface.
 - Database - PostgreSQL (Can be easily integrated with Django through ORM).

- AI and Natural Language Processing
 - Hugging Face Transformers - To utilize pre-trained models to generate questions and analyze responses.
 - OpenAI Whisper - For high quality speech to text , to convert candidates' spoken answers into text.
 - Mozilla TTS or Coqui TTS - For high quality text to speech synthesis.
 - Pytorch - To finetune models if needed.
 - Scikit-Learn - For keyword matching the candidates answer to the answer generated by the LLM (model answer).
 - Bert/Bert variants - For semantic analysis of the candidates response.
 - WebRTC - For real-time audio and video communication , enabling interaction during interviews.
 - OpenCV - To analyze video feed and detect eye contact.
 - Git - For version Control

5. Features of the solution

Our AI-powered platform includes a variety of features designed to improve the interview process in order to help businesses assess applicants more effectively and job seekers prepare for interviews. Our AI-powered platform includes a variety of features designed to improve the interview process in order to help businesses assess applicants more effectively and job seekers prepare for interviews.

1. Feedback on Candidate Performance

After examining the candidates' given answers, confident level, emotional expression and community clarity this software gives candidates/job seekers on time feedback on their interviewing abilities. After that, candidates can monitor their progress in these measures over time and pinpoint areas that need attention.

Benefits:

1. Monitor the progress of candidates
2. Set measurable goals
3. Visual feedback (charts/graphs)

2. AI-Driven Mock Interview Partner

This software will offer an AI powered interview partner that creates realistic interview Scenarios. This AI program asks questions, evaluates responses and then provides a fully examined the interview session at the end of the session. Also it can simulate conversations where The candidate must lead or solve team related issues.

3. Gamified Interview Preparation

In this Gamification feature skill based challenges and a leaderboard system will be incorporated into the platform. The score sections for technical, soft and communication skills will be shown separately, and candidates will be ranked according to their job specific abilities.

Benefits:

1. Candidates can review their progress.
2. Creates an engaging environment that motivates candidates
3. Can identify the areas that need to be improved

4. Body Language and Posture Analysis

Body language is the best way to measure the confidence level of a candidate. During the interview this AI feature will examine candidates posture and body language via webcam, it will offer input on posture, eye contact, facial emotions and hand movement.

Benefits:

1. Candidates receive constructive feedback on physical aspects of their performance.

5. Candidate-Employer Matching Feature

There is a requirement in this system that users must connect their LinkedIn account when they sign up. Candidates are suggested to companies based on their CV uploaded by the user.

6. Dynamic Question Generation

Using professional-level theory and real-world interview questions created by NLP (Natural Language Processing) based on user-response categories is an amazing feature for interview preparation. Top IT organizations also ask a series of pre-formulated real-time interview questions. The complexity of the questions will change based on the candidate's responses.

Benefits:

1. Candidates can face realistic interview environment
2. Allows candidates to practice responding to questions that are tailored to their experience and the job role

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