AI MOCK INTERVIEW PLATFORM

Team Helix

Problem Statement:

Preparing for interviews is challenging due to limited access to expert mock interviewers, high subjectivity in feedback, inconsistent evaluation, scheduling issues, and lack of scalable personalized guidance. Existing interview practice applications behave like simple chatbots and fail to replicate the real interview environment.

Current tools do **not** evaluate critical aspects such as:

- Confidence and nervousness
- Body language (posture, gaze, expressions)
- Tone, clarity, and speech patterns
- Adaptive questioning based on responses

There is a strong need for an **AI-powered, multimodal interview simulator** that offers **real-time interaction**, **objective scoring**, and **personalized improvement suggestions**.

Approach & AI Components

This platform integrates **Generative AI, Speech Processing, NLP, and Computer Vision** into a unified interview system, as outlined in your project specification.

A. Resume Analysis

- Extract text using PyPDF2 & SpaCy.
- LLM analyzes strengths, gaps, and generates role-specific questions.
- Tailors the interview difficulty based on skill coverage.

B. AI-Driven Real-Time Interview

- Role-based interviews (ML Engineer, Data Analyst, HR, etc.).
- Whisper STT converts answers to text.
- LLM evaluates responses and generates adaptive follow-up questions.
- gTTS produces spoken questions for realistic simulation.

C. Audio Intelligence

- Speech rate, clarity, tone stability (jitter), and fluency scoring.
- Nervousness estimation using voice stress patterns.

D. Computer Vision Analysis

- MediaPipe posture tracking (head tilt, spine angle).
- Eye-gaze tracking and blink-rate attention scoring.
- Emotion recognition via CNN model.

E. Multimodal Scoring Engine

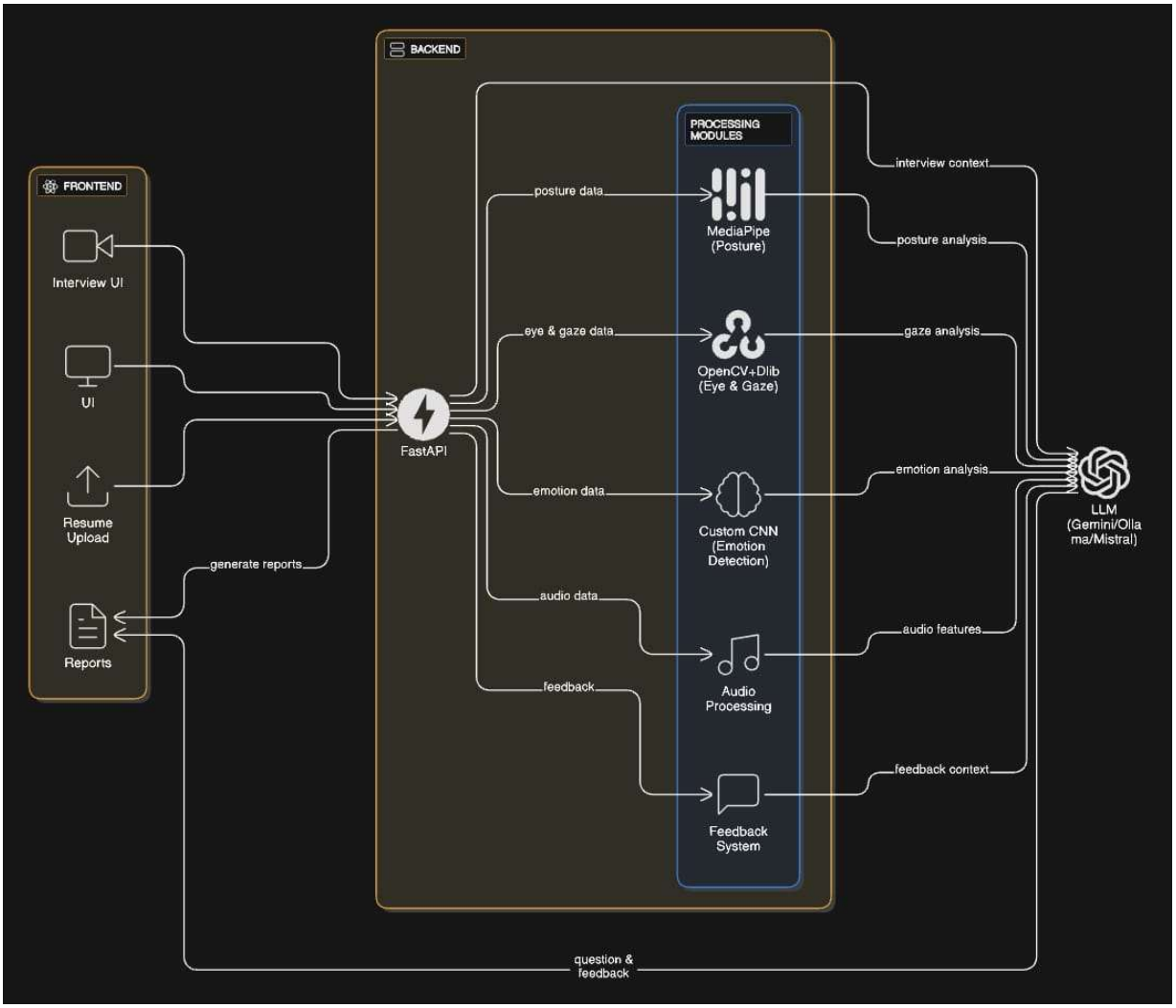
Weighted scoring rubric includes:

1. Technical Accuracy — 45%
2. Communication Quality — 20%
3. Body Language — 15%
4. Attention & Engagement — 10%
5. Nervousness Score — Heuristic (CV + audio)

F. Final Feedback Report

- Full transcript with answer evaluation
- Behavioral metrics (confidence, posture, gaze, tone)
- Customized improvement roadmap
- Recommended resources & next steps

Technical Architecture



Challenges & Mitigations:

1. Posture Detection Tracking

Mitigations: Diverse training data, smoothing filters, human-in-loop validation, safety layers.

2. Real-Time Coding Problems

Mitigations: Rule-based constraints, test-case validation, expert reviews, content filters.

3. Database Connectivity & Scalability

Mitigations: Cloud scaling, caching, encryption, anonymization, access control, UX performance tuning.

Roadmap to Final Build:

- **Cheat Detection (1-2 Days):** Implement gaze tracking, background-voice detection, and answer plagiarism checks.
- **Real-Time Interrupting AI (1-2 Days):** Enable streaming STT + dynamic LLM follow-ups that interrupt off-track or overly long responses.
- **Company-Specific Simulation (1-2 Days):** Train prompts for FAANG/service/product companies with tailored interview questions, flows and evaluation criteria.
- **UI Polishing & Deployment (1 Day):** Refine UI/UX, add error states, deploy on Vercel + Render, run end-to-end tests.
- **Judge Demo Prep (Last 1 Day Before Finale):** Create demo script, backup video, highlight key features, generate sample reports.