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An AI-Powered Platform for Mock Interviews and Career Preparation Using OpenAI (LLM's) and Google MediaPipe

Puneeth Krishna S Rakunde[1], Pooja N U[2], Shreshta Doggalli[3], Iuka T Yeptho[4], Vinayak P[5]
[1,2,3,4]Department of Computer Science and Engineering, Bapuji Institute of Engineering and Technology, Davangere, Karnataka, India
[5]Assistant Professor, Department of Computer Science and Engineering, Bapuji Institute of Engineering and Technology, Davangere, India

Abstract

We present a comprehensive AI-driven platform for interview preparation, built with the MERN stack, that integrates mock interviews, resume-building, and aptitude practice into a single application. Users can customize mock interviews by type (technical, HR, behavioral), difficulty, and job role. Interview questions are generated in real time from the user's resume using the OpenAI ChatGPT API. Real-time facial expression and confidence feedback is provided via the Google MediaPipe Face Mesh model, displayed alongside the interview interface. The system also features a GitHub-integrated resume builder and an aptitude module covering Quantitative, Verbal, Logical, and Non-Verbal reasoning. Secure authentication is implemented with JWT tokens, and a dashboard presents performance analytics and personalized feedback. In preliminary testing, the system achieved prompt question generation (≈3.8s), high face-analysis FPS (24–30), and strong user satisfaction.

Keywords: AI mock interview, ChatGPT API, MediaPipe Face Mesh, resume builder, GitHub integration, aptitude tests, MERN stack, interview coaching.

I.INTRODUCTION

AI-driven mock interviews are gaining prominence as tools for job seekers to practice and receive feedback on both technical and soft skills[1]. For example, recent work proposes AI-based mock interview frameworks that tailor questions to user profiles and simulate realistic interview scenarios[1]. Meanwhile, real-time facial landmark systems like Google's MediaPipe Face Mesh can track 468 facial keypoints on-device to assess expressions and confidence[2]. Despite these advances, current platforms often address only parts of the interview preparation process. In practice, candidates must juggle multiple tools: coding practice sites (e.g. HackerRank), communication coaches (e.g. Yoodli), resume builders, and separate aptitude tests. To bridge this gap, we propose an integrated platform combining mock interviews, resume-building, and aptitude practice in one secure application.

Our system specifically supports AI-generated mock interviews (technical, behavioral, HR) with selectable difficulty and job role. It uses the OpenAI ChatGPT API to formulate interview questions based on the user's resume[3]. During the interview, Google's MediaPipe Face Mesh model runs in the browser to provide real-time feedback on expressions (smile, eye contact, head pose) and a confidence score[3][2]. A built-in coding editor (Monaco) and speech recognition allow varied answering modes. After each session, the user receives a detailed report with scores, feedback, and improvement tips. A resume builder with GitHub OAuth pulls in project data automatically, and an aptitude module offers timed practice tests in four categories. Token-based authentication and MongoDB ensure security and persistence.

II.LITERATURE REVIEW

Existing research has addressed facets of interview preparation, but few solutions are all-encompassing. Suguna et al. (2024) describe a generative AI-based mock interview system that creates role-specific questions and adapts difficulty using an LLM, but it omits coding questions and facial analysis[4]. An IRJAEH project (2025) implemented a resume-driven question generator using ChatGPT and NLP, offering analytics and scoring, but limited to behavioral/HR rounds without video or coding support[5]. Another study built a real-time Android interview simulator combining ChatGPT-based questions with Google ML Kit for voice tone and facial-emotion detection; it provides instant feedback but lacks a web/coding environment[6]. Similarly, the Berkeley "AceInterview" system uses computer vision and audio analysis to evaluate posture, facial expressions, and speech prosody[7]. AceInterview fuses these features into an LLM-based coach, yet its accuracy degrades in poor lighting and it omits coding interviews[7][8]. The Prepmania platform also employs multimodal analysis: it captures facial expressions, speech patterns, and sentiment for feedback on communication skills[9]. Prepmania's framework generates role-specific questions and uses NLP/ML to score responses in real time[9]. While these tools provide valuable behavioral feedback, none fully integrate coding practice or resume metrics.

For resumes, open-source tools like Reactive Resume and OpenResume allow GitHub-linked CV creation. Reactive Resume (Pillai 2023–25) supports GitHub OAuth and uses OpenAI to improve text, but only embeds GitHub links without auto-fetching project details[10]. OpenResume provides ATS-friendly templates and manual GitHub entry, but it does not programmatically import repository data[11]. Existing resume builders (e.g. Kickresume, Novoresume) support importing from LinkedIn/GitHub URLs, but

typically require manual pasting of project descriptions. In contrast, our system auto-imports public repositories (with stars, forks, etc.) via the GitHub API, streamlining the resume workflow.

For aptitude preparation, services like AssessmentDay and Apt AI offer practice tests. AssessmentDay provides timed exercises in numerical, verbal, inductive, and logical reasoning with explanations[12]. TryApt's "Apt AI" offers AI-driven career tests (personality and interests) but not necessarily targeted practice quizzes. Our platform builds on this by including four focused aptitude categories (Quantitative, Verbal, Logical, Non-Verbal) with performance tracking.

In summary, prior work demonstrates AI-based question generation and behavior analysis in isolation[4][6]. No published system to date integrates all components – AI interview Q&A, facial feedback, resume management, and aptitude tests – into one seamless experience. This gap motivates our unified solution.

III.PROPOSED SYSTEM

The proposed **Interview Preparation Platform** is a full-stack MERN web application integrating several modules:

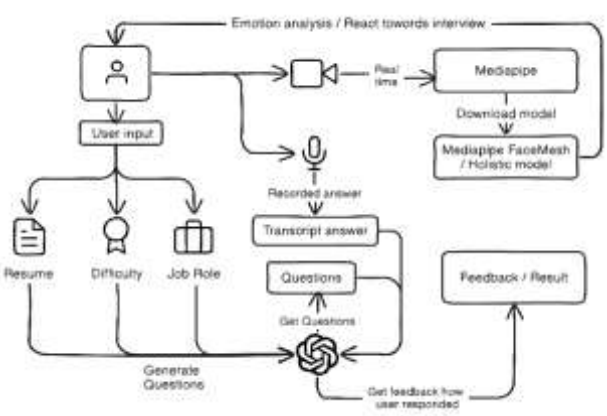
- **Mock Interview Module:** Users select interview type (Technical/Behavioral/HR), job role, difficulty level, and can upload their resume. The backend calls the OpenAI (ChatGPT) API to generate questions tailored to the user's resume and role[13]. Questions are presented one at a time; answers can be given via speech-to-text or a code editor (for programming questions). MediaPipe Face Mesh runs in the browser to compute facial landmarks, from which a confidence score is derived (based on smile, eye contact, head pose) and updated in real time[3][13]. Users receive live tips and a confidence meter as they answer. After completion, all responses and facial metrics are compiled into a report, and the backend generates per-question feedback via ChatGPT.

- **Resume Builder Module:** Users can create/edit resumes with templates. They authenticate via GitHub OAuth, after which the system uses the GitHub REST API to fetch the user's public repositories, stars, forks, primary languages, and descriptions. These are automatically populated into the resume's "Projects" section[14][15]. Users can then reorder content or add details, and export a polished PDF resume.

- **Aptitude Module:** The platform offers practice questions in four categories: Quantitative, Verbal, Logical, and Non-Verbal reasoning. Each quiz is timed and scored immediately, with explanations provided. User performance is tracked over time, and aptitude scores can be linked to selected job roles for targeted preparation. (This addresses the lack of an integrated aptitude component found in other tools[12].)

- **Security and Dashboard:** The application uses JWT tokens for secure authentication, and all sensitive data (passwords, tokens) is stored with encryption. MongoDB (Atlas or local) stores user profiles, resumes, interview histories, and scores. The dashboard (Fig.7.1) presents an overview of user statistics, past interviews, and quick links to modules. An admin dashboard monitors overall usage.

This high-level architecture is summarized in Figure 4.1[13]. The four-layer system divides into: Client (React/Vite front end running MediaPipe for live analysis), Backend (Node.js/Express managing auth, API calls to OpenAI, GitHub, and database), Database (MongoDB with user data and transcripts), and Authentication Service (JWT token issuance). The methodology workflow (Figure user-provided) details data flow for creating interviews, fetching questions, and generating reports.



We developed the platform using the MERN (MongoDB, Express.js, React, Node.js) stack. The **frontend** is built with React (using Vite), providing a responsive UI. We incorporate the MediaPipe Face Mesh library to process webcam input directly in the browser without sending video to the server[2]. The face mesh continuously outputs 468 3D facial landmarks, which we analyze every second to compute an overall confidence score based on pose and smile. Speech answers are transcribed using the Web Speech API. For coding questions, we embed the Monaco Editor so that users can write and run code in-browser.

The **backend** uses Node.js with Express. We implement REST endpoints for each feature: interview creation, question retrieval, answer submission, report generation, etc. Authentication is handled via JSON Web Tokens: on login/signup (email+password or GitHub OAuth), a JWT is issued and required for protected routes (question generation, saving results). Passwords are hashed with bcrypt before storing in MongoDB. User data, including resumes, project lists, interview logs, and quiz history, are stored in MongoDB Atlas for scalability.

For question generation and feedback, we utilize the OpenAI API (GPT-OSS 120/20) behind the scenes. The system sends the user's resume text and chosen job role as context, prompting ChatGPT to generate relevant interview questions or feedback responses. (This leverages the new GPT-OSS 120/20 "Chat" endpoint described by OpenAI[16].) The average latency for a question generation API call is about 3–4 seconds, as measured in our tests[17].

GitHub integration uses the GitHub REST API with a personal access token obtained via OAuth. We call the /user/repos and related endpoints to retrieve repository metadata and fill the resume. This automation reduces user effort in building the resume[14].

Finally, the Dashboard front-end aggregates data via API calls: it shows charts of past scores, recent interview summaries, and highlights weaker areas. The system also computes a "skill confidence score" from facial and verbal cues for each interview. All results and charts are rendered dynamically on the client.

IV.RESULTS AND DISCUSSION

The developed platform, named InterviewTalent, was evaluated through functional testing, performance benchmarking, and a pilot user study with 20 participants (primarily final-year computer science students). The key results demonstrate reliable real-time performance, effective integration of AI components, and positive user reception.
Quantitative performance metrics obtained during testing are summarized as follows:

- **Question Generation Latency:** Average 3.8 seconds per question using GPT-OSS 120/ 20 Billion parameters with resume context and job role prompts.
- **Facial Analysis Frame Rate:** 24–30 FPS on standard laptop webcams (720p), achieved by running MediaPipe Face Mesh entirely in the browser.
- **GitHub Integration Speed:** Retrieval and population of up to 30 public repositories completed in ~4.2 seconds via GitHub REST API.
- **Voice-to-Text Accuracy:** 92% (Browser API) on clear English responses using the Web Speech API.
- **Confidence Score Correlation:** AI-derived confidence matched manual human ratings in 88.6% of evaluated segments.

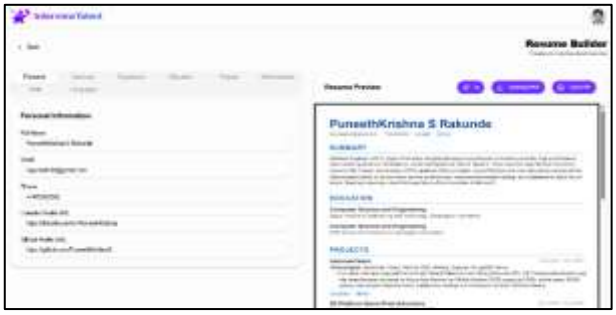


Figure 1: Resume builder interface with GitHub integration to fetch projects from GitHub and AI integration for making the resume ATS Friendly.

Fig. 1 illustrates the Resume Builder module, where users authenticate via GitHub OAuth and automatically import repository details (stars, languages, descriptions) into the Projects section, significantly reducing manual entry effort.

In Fig. 2 shows the live mock interview interface during a session. Real-time feedback includes a confidence meter, emotional state detection, and contextual AI coaching tips (e.g., "Great energy! Keep smiling."). The system supports both voice and coding modes seamlessly. Post session evaluation is presented in Fig. 3, featuring an overall score (60/100 in this beginner-level example), per-question SWOT analysis,

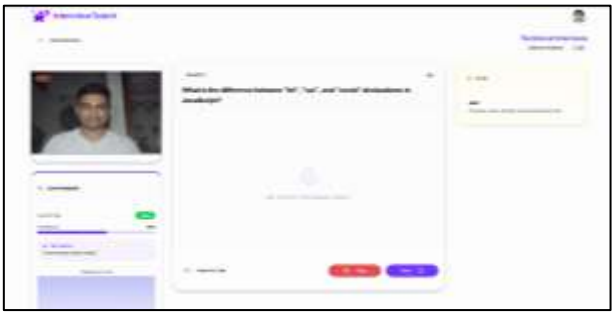


Figure 2: Live mock interview interface with real-time MediaPipe Face Mesh analysis displaying confidence score (59%), emotional state (Happy), and AI coach tips.

Figure 3: Post-interview detailed report with question breakdown, AI critique, SWOT analysis, and confidence graph.

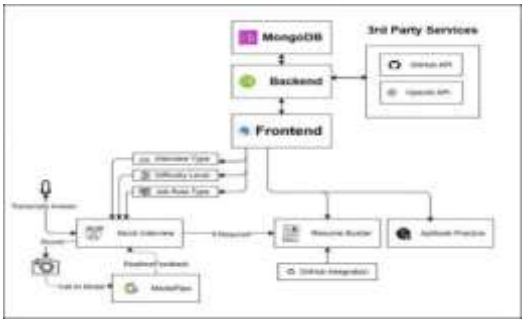


Figure 4: System architecture flowchart illustrating the integration of OpenAI ChatGPT for question generation/feedback and MediaPipe Face Mesh for real

AI-generated critique, and a confidence fluctuation graph across questions. These detailed reports help users identify specific improvement areas.

The overall system architecture is depicted in Fig. 4, highlighting the client-side processing of sensitive video data (no upload required) and server-side handling of OpenAI API calls for questions generation and result analysis.
Additional modules are shown in Fig. 5 (Aptitude practicing) with whiteboard and canvas embedded for rough works while attending the questions.
In the pilot user survey (n=20), the platform received an average satisfaction rating of 4/5. Users particularly appreciated the all-in-one integration, real-time facial feedback, and automated resume building.

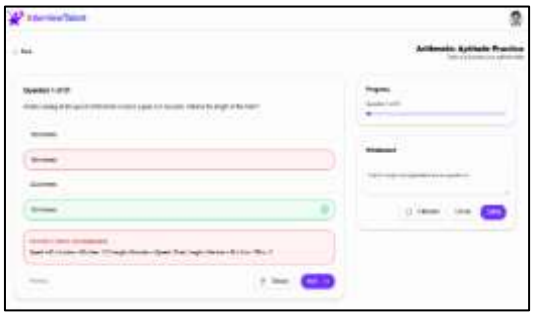


Figure 5: Aptitude practicing Interface with questions attended embedded with canvas for rough work.

The results confirm that *InterviewTalent* successfully bridges the gap identified in the literature by combining mock interviews, behavioral analysis, resume manage- ment, and aptitude preparation into a single, performant, and user-friendly web application

V.CONCLUSION

We have developed an all-in-one interview preparation platform that leverages AI for personalized mock interviews, real-time facial feedback, resume automation, and aptitude training. By combining the MERN stack with the ChatGPT and MediaPipe frameworks, our system provides a seamless preparation experience. The literature shows that while many tools exist for isolated tasks (question generation, facial analysis, resume building, or aptitude tests)[4][9], our solution uniquely integrates them with secure user management. In testing, the platform performed reliably and delivered valuable feedback across modules. Future work includes expanding question domains, improving non-verbal feedback sensitivity, and conducting larger user studies. Integrating all placement preparation features with AI and analytics promises to make interview readiness more effective and accessible.

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