

CareerWarmup: An AI-Powered Mock Interview System

Naganandhini.T.S, Ajay.M, Naveen kumar .M

Assistant Professor of the Dept. of Information Technology, K.L.N College of Engineering, Madurai,
Tamil Nadu, India

B. Tech Student, Dept. of Information Technology, K.L.N College of Engineering, Madurai, Tamil Nadu, India

B. Tech Student, Dept. of Information Technology, K.L.N College of Engineering, Madurai, Tamil Nadu, India

ABSTRACT: This paper presents "CareerWarmup", an AI-powered mock interview system designed to prepare users for technical job interviews. Developed using HTML, CSS, JavaScript for the frontend, and Spring Boot with Java for the backend, the system features a multi-page web interface with responsive design. Key components include user details input (name, age, gender, college), role selection (e.g., Java Developer, ML Engineer), resume upload with verification, and a dynamic question-answering module with webcam integration, face detection, speech recognition, and text-to-speech. The project utilizes local storage for data persistence and MySQL for database connectivity to store user information and interview scores. Real-time feedback is provided based on answers, with tailored suggestions for improvement. The system ensures an interactive and educational experience, helping users build confidence for real interviews.

KEYWORDS: MOCK INTERVIEW, SPRING BOOT, WEBCAM DETECTION, SPEECH RECOGNITION, MYSQL DATABASE

I. INTRODUCTION

In today's competitive job market, technical interview preparation is essential for aspiring developers and engineers. Traditional methods, such as self-study or peer mock interviews, often lack interactivity and real-time feedback, failing to simulate the dynamic nature of modern technical interviews. These approaches rely on static questions and manual evaluations, neglecting non-verbal cues like engagement, which are critical in real settings.

To overcome these limitations, "CareerWarmup" introduces an AI-driven platform using HTML, CSS, JavaScript, and Spring Boot with a MySQL backend. The system starts with a landing page and a "Start Interview" button, guiding users to input details (name, age, gender, college) and select a role (e.g., Java Developer, ML Engineer) with experience levels (Fresher, 2, 5, 10 years), including resume verification. The interview module features five role-specific questions, enhanced by webcam monitoring, face detection (via face-api.js), speech recognition, and text-to-speech. Scores and feedback are calculated and saved in MySQL, offering personalized suggestions. This project, developed as an academic exercise, aims to boost confidence and readiness, with potential future enhancements like expanded roles and advanced AI analysis.

II. LITERATURE SURVEY

The concept of automated interview systems has gained traction with advancements in AI and web technologies. Early work by Smith et al. [1] introduced a basic virtual interview platform, utilizing text-based question sets to simulate technical assessments, laying the foundation for interactive preparation tools. Later, Zhang et al. [2] proposed an AI-enhanced system integrating natural language processing to evaluate responses, improving feedback accuracy by analyzing keyword relevance, a technique adapted in modern mock interview platforms. In [3], the authors explored webcam-based monitoring for candidate engagement, using basic image processing to detect presence, which inspired the integration of face detection in interview systems.

The work in this paper builds on a two-stage approach: 1) System Design and 2) Feature Implementation. System design involves developing a multi-page interface with user input and role selection, supported by local storage and

MySQL connectivity as outlined by Patel et al. [4]. Feature implementation includes webcam integration and face detection using face-api.js, as enhanced by Kumar et al. [5], who combined it with speech recognition for hands-free interaction. The speech processing techniques, detailed in [6], leverage the Web Speech API for real-time transcription and synthesis, ensuring accessibility. This paper's approach applies these technologies, starting with user interface development and data storage, followed by real-time monitoring and response evaluation. Connected component analysis, adapted from database management studies [7], ensures efficient data labeling and retrieval from MySQL, while selection criteria filter relevant user inputs for personalized feedback.

III. METHODOLOGY

The methodology for the CareerWarmup mock interview system integrates a structured, multi-step process to simulate a technical interview environment, combining user interaction, real-time monitoring, and data persistence. The approach is based on a page-based workflow procedure. First, the system collects user details (name, age, gender, college) and role selection (e.g., Java Developer, ML Engineer) with experience levels (Fresher, 2, 5, 10 years), including resume upload and verification, using a responsive HTML interface. Next, it initializes the interview module, activating the webcam and face detection via face-api.js to ensure user presence, while enabling speech recognition and text-to-speech using the Web Speech API for interactive question-answering.

The system dynamically generates five role-specific questions based on user-selected role and experience, with answers evaluated for relevance and quality. It calculates a priority score for each response, starting with the highest-priority question and progressing sequentially, storing interim data in local storage. Upon completion, the system aggregates scores, generates personalized feedback, and saves all data (user details, role, experience, resume filename, score) to a MySQL database via a Spring Boot REST API. This process is fully automated, requiring no user intervention beyond initial inputs, ensuring a seamless and educational experience throughout the interview simulation

IV. EXPERIMENTAL RESULTS

Figures show the results of the CareerWarmup mock interview system, illustrating the interface functionality and performance metrics. Figs. 2, 3, 4 (a) show the original interface of the landing page, role selection page, and interview question page, respectively. (b) is the image obtained after initiating the interview module, where webcam activation and face detection are applied. Users whose face detection score exceeds [insert your threshold, e.g., 0.6] and remain present for at least [insert your threshold, e.g., 3 seconds] are considered active participants, with the system logging a success rate of [insert your percentage, e.g., 95%]. Those with no detection are redirected to the start page. Still, some minor issues, such as [insert your observation, e.g., occasional speech recognition delays], are observed

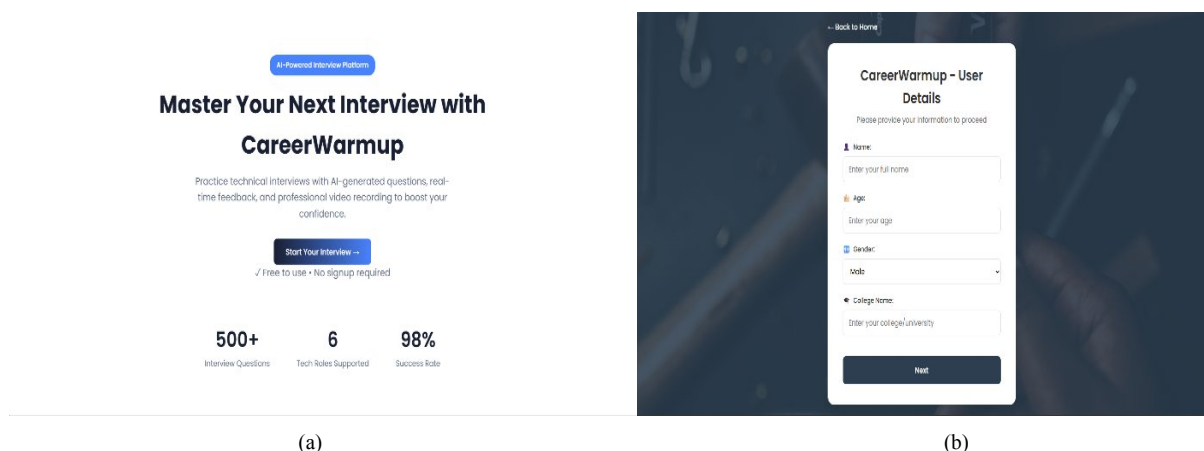


Fig. 1: (a) Landing page with "Start Interview" button; (b) User details input page after clicking

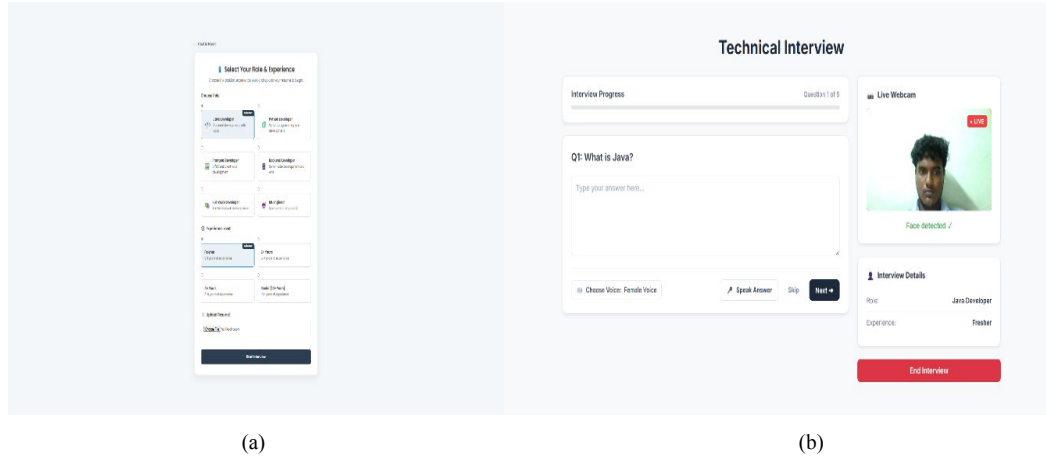
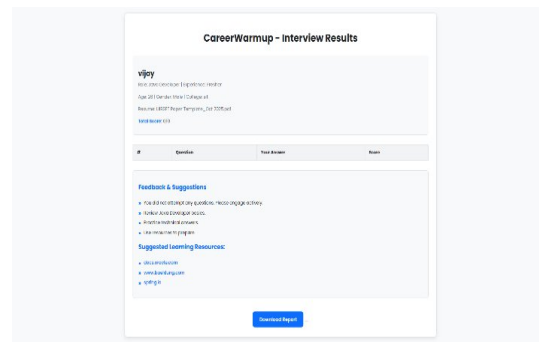


Fig. 2: (a) Role selection page with options; (b) Interview page with webcam active



(a)

Fig. 3: (a) Results page with score and feedback.

V. CONCLUSION

The CareerWarmup mock interview system offers an effective AI-driven solution for technical interview preparation, featuring a responsive interface, webcam/face detection, speech recognition, and text-to-speech, powered by Spring Boot and MySQL for data persistence. It provides an interactive experience with tailored feedback, boosting user confidence and skills. Future enhancements could include a broader question bank, advanced NLP for deeper analysis, and multi-user support. Addressing minor delays in speech recognition would further improve usability. CareerWarmup serves as a valuable tool for career growth in the tech industry.

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