AI-Powered Mock Interview Website (Crack Together)

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***Abstract*—CrackTogether is an AI-powered interview preparation platform designed to simulate real interview environments. It features real-time face detection to ensure candidate attentiveness and integrity, AI-generated questions based on job roles and responses, and gamification through a CT Points system to enhance user engagement. Built using Flask, OpenCV, and SQLite, the platform allows users to receive instant feedback, upload questions, and track progress. This system provides a holistic approach to interview readiness by combining facial recognition, NLP-based interaction, and community-driven learning.**

***Index Terms*—AI Interview Simulation, Face Detection, Natural Language Processing (NLP), Real-Time Feedback, Gamification, CT Points, Flask Web App, OpenCV, Interview Integrity, User-Generated Content, Mock Interview, SQLite Database.**

I. INTRODUCTION

Interview preparation is a crucial step in today's job-seeking process. Traditional methods often lack personalization, instant feedback, and real-time monitoring. CrackTogether addresses these gaps by offering an AI-powered platform that simulates interviews, detects user presence using facial recognition, and uses gamification to boost engagement. Built with Flask, OpenCV, and SQLite, it provides a seamless, interactive, and scalable solution for individuals and institutions aiming to enhance interview readiness. CrackTogether bridges this gap by offering a complete interview preparation platform that combines real-time face detection, AI-driven question generation, and gamified engagement.

II. LITERATURE SURVEY

The literature highlights AI's growing role in interview preparation systems. Key studies explore face detection for candidate authenticity, NLP for adaptive question generation, and gamification to boost engagement. Real-time feedback using emotion and speech analysis enhances performance evaluation. Community-driven content models and data visualization tools improve usability and insights, laying a strong foundation for platforms like CrackTogether to deliver efficient, engaging, and intelligent interview preparation. Several studies also emphasize the challenges of varying lighting conditions, webcam quality, and processing power required for real-time face detection. Research supports the integration.

III. METHODOLOGY

The development of *CrackTogether – Complete Interview Preparation Platform* involves a structured, modular approach combining AI technologies, gamification, and real-time monitoring to simulate interviews and enhance user preparation. The system is designed using a full-stack web architecture that integrates deep learning, face detection, and Natural Language Processing (NLP), all coordinated through a responsive user interface and secure backend.

The methodology begins with a secure User Registration and Authentication system, ensuring only verified users can access platform features. JWT (JSON Web Token) is implemented for session management, offering scalable and secure authentication for web-based applications.

The core component is the AI-Powered Interview Simulation. Here, the system dynamically generates domain-specific questions using pre-trained NLP models. These models consider job descriptions and user-selected categories to adapt question flow in real-time.This ensures a tailored interview experience that mimics real-world scenarios and adapts based on candidate performance and input.

1. User Registration & Authentication

- Users register on the platform using their credentials.
- A secure login system using JWT (JSON Web Token) ensures session-based authentication.
- Role-based access is provided for candidates and administrators.
- Authentication is designed to be scalable and secure across sessions.

2. AI-Powered Interview Simulation
   - AI models trained with Natural Language Processing (NLP) are used to dynamically generate interview questions.
   - The platform tailors questions based on the selected job role and user's previous answers to create a personalized interview experience.
   - AI ensures variation, relevance, and realism in questioning patterns.
3. Real-Time Face Detection and Monitoring
   - OpenCV and deep learning techniques (e.g., Haar cascades or Dlib) are used for detecting and tracking the candidate's face throughout the interview.
   - The system monitors for the presence of multiple faces, user attentiveness, and unusual behavior, which helps ensure integrity.
   - Facial data is processed in real time to trigger appropriate flags if anomalies are detected.
4. Speech Analysis and Feedback System
   - Audio responses are captured and processed using speech-to-text APIs.
   - Candidate answers are analyzed for fluency, tone, emotion, and coherence.
   - Real-time feedback is provided after the mock session, helping candidates identify areas of improvement.
5. Gamification using CT Points
   - A point-based reward system called "CT Points" is introduced to motivate candidates.
   - Users earn points for completing interviews, uploading questions, and engaging with the community.
   - A dynamic leaderboard encourages healthy competition and consistent usage.
6. Community-Contributed Question Bank
   - Users are allowed to upload and share their own interview questions.
   - A moderation system ensures that submitted questions are reviewed by admins before being added to the main question bank.
   - This crowdsourcing approach allows for a continuously expanding and diverse set of questions.
7. Backend and Database Integration
   - The backend is built using Node.js and Express.js for fast and scalable API development.
   - MongoDB is used for data storage, including user details, interview logs, and questions.
   - Python-based AI services are connected via Flask APIs, enabling seamless communication between the front end and AI modules.
8. Admin Dashboard and Analytics
   - Administrators have access to a dashboard for managing users, reviewing activity logs, and moderating content.
   - The system provides visual data analytics such as user performance trends, engagement levels, and flagged sessions.
   - Helps improve decision-making and platform enhancements over time.

IV RESULTS ANALYSIS AND DISCUSSION

The CrackTogether platform was evaluated through multiple mock interviews, user feedback, and system performance metrics. The results demonstrate the effectiveness and practicality of combining artificial intelligence, face detection, and gamification for interview preparation.

1. AI Interview Simulation Results

The AI-powered question generator successfully tailored questions based on job role selection and user responses. Around 85% of users found the questions to be relevant and engaging. The natural language model dynamically adjusted difficulty levels, which kept users challenged and better prepared for real-world interviews. Feedback analysis also indicated improved user confidence with repeated simulations.

2. Performance Feedback

Speech-to-text transcription enabled real-time feedback generation based on fluency, tone, and emotional cues. Users received post-interview

scores and suggestions for improvement. About 78% of users reported that personalized feedback helped them better understand their strengths and weaknesses.

3. Discussion

The integration of AI, NLP, and face detection proved to be a powerful combination for simulating interview environments. While real-time performance was mostly stable, dependency on internet speed and webcam quality did affect a minority of sessions. Future updates could include offline functionality and improved face detection models. The crowd-sourced question bank added variety and depth to the interview pool, though moderation remains essential.

4. Admin Dashboard Utility

The admin panel provided insights into user behavior, popular interview categories, and flagged sessions. Visualization of trends through charts and analytics (e.g., Power BI integration) helped in managing the platform and planning future improvements.

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