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AI Interview Mocker Web-Application

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ABSTRACT—

This paper presents the development of an AI-powered mock interview application designed to help users prepare for job interviews. The application, built using Next.js, React, Drizzle ORM, Gemini AI, and Clerk, provides a realistic simulation of an interview environment. Users can select their desired job role and experience level, after which the system generates relevant interview questions using Gemini AI. The application also offers feedback on user responses, aiding in skill improvement. The project demonstrates the integration of modern web technologies with AI services to create an interactive and educational tool.

Keywords—artificial intelligence, mock interview, Next.js, React, Gemini AI, Drizzle ORM, Clerk, web application, interview preparation

Introduction

Job interviews are a critical step in the hiring process, and adequate preparation can significantly impact a candidate's performance. Traditional methods, such as practicing with friends or using static question banks, may not fully simulate the dynamic nature of real interviews. With advancements in artificial intelligence, particularly in natural language processing, it is now possible to create more interactive and responsive mock interview systems. This paper introduces the AI Interviewer Mocker, a web application that leverages AI to generate personalized interview questions and provide feedback, thereby offering a more effective preparation tool for job seekers.

The application is built using a stack of modern technologies: Next.js and React for the frontend, Drizzle ORM for database management, Gemini AI for question generation, and Clerk for user authentication. This paper details the system design, implementation, and results of the project, showcasing how these technologies are integrated to create a seamless user experience.

Literature Review

The integration of artificial intelligence (AI) into educational tools has revolutionized various aspects of learning and assessment, including interview preparation. Large language models (LLMs) such as GPT-3 and its successors have been pivotal in automating the generation of educational questions, thereby enhancing the efficiency and effectiveness of learning processes. For instance, a study by [authors] in 2022 investigated the utility of pretrained language models for automatic educational assessment question generation, demonstrating their potential to create high-quality, human-like questions (Towards Human-Like Educational Question Generation with Large Language Models). Similarly, another study from 2024 examined multiple approaches for generating question-answer pairs using pre-trained LLMs in higher education, highlighting their efficacy and constraints (Automatic question-answer pairs generation using pre-trained large language models in higher education).

Our project, the AI Interviewer Mocker, builds upon these advancements by employing Gemini AI to generate personalized interview questions based on the user's selected job role and experience level. This approach ensures that the questions are relevant and tailored to the specific needs of the user, thereby enhancing the realism and effectiveness of the mock interview experience. While current implementations often focus on feedback and behavioral analysis, our project contributes to the growing body of work by providing a scalable and accessible tool for practice, leveraging the capabilities of LLMs to meet the dynamic needs of job seekers.

TABLE I. SUMMARY OF RELATED WORK

Study	Year	Focus	Key Tech	Contribution
Chou et al.	2022	Feedback on performance	AI, video analysis	Analyzes emotions, voice for feedback
Dissanayake et al.	2021	Behavioral analysis	Deep learning, ML	Assesses nonverbal cues with >85% accuracy

VR Job Simulator	2018	Immersive training	VR, chatbots, AI	Includes emotion recognition for feedback
VR and Generative AI	2024	Immersive simulations	VR, generative AI	Tailored to language needs, multimodal
AI-Driven Mock Interviews	2024	Question generation, feedback	GPT-4, NLP	Automates questions, personalized feedback

System Design

The AI Interviewer Mocker is designed with a client-server architecture, where the frontend is developed using Next.js and React, and the backend logic is handled through Next.js API routes. The system interacts with a PostgreSQL database using Drizzle ORM for data persistence and calls the Gemini AI API for generating interview questions. User authentication is managed by Clerk, ensuring secure access to the application.
The key components of the system are:

- **Frontend:** Built with Next.js and React, providing a responsive and interactive user interface.
- **Backend:** Utilizes Next.js API routes to handle requests, manage database operations, and integrate with external APIs.
- **Database:** PostgreSQL, managed through Drizzle ORM, storing user data, interview sessions, and questions.
- **AI Service:** Gemini AI API, used to generate contextually relevant interview questions based on user inputs.
- **Authentication:** Clerk, providing user registration, login, and session management.

TABLE II. TECHNOLOGIES USED

Technology	Purpose
Next.js	Frontend framework and API routes
React	User interface components
Drizzle ORM	Database interactions
PostgreSQL	Data storage
Gemini AI	Question generation
Clerk	User authentication

Implementation

The implementation of the AI Interviewer Mocker involved several steps, from setting up the development environment to integrating various services and APIs.

First, a Next.js project was initialized, and necessary dependencies were installed, including Drizzle ORM for database management and Clerk for authentication.

Authentication

Clerk was integrated to handle user authentication. This involved setting up Clerk's SDK in the Next.js application, configuring the authentication middleware, and creating login and sign-up pages. Clerk provides a seamless way to manage user sessions and protect routes that require authentication.

Database Design

The database schema was designed using Drizzle ORM's type-safe queries. Tables were created for users, job roles, interview sessions, and questions. For example, the users table stores user information, while the interview_sessions table keeps track of each mock interview initiated by the user, including the selected job role and experience level.

API Routes

Next.js API routes were implemented to handle backend logic. A key API route is responsible for initiating a mock interview. When a user starts an interview, the frontend sends a request to this API route with the selected job role and experience level. The backend then calls the Gemini AI API, passing these parameters to generate a set of relevant interview questions. The questions are received, stored in the database associated with the user's session, and sent back to the frontend for display.

AI Integration

Integrating the Gemini AI API was a crucial part of the project. The API was called from the backend API route using HTTP requests, with the necessary authentication and parameters. The response from the API, containing the generated questions, was parsed and stored in the database.

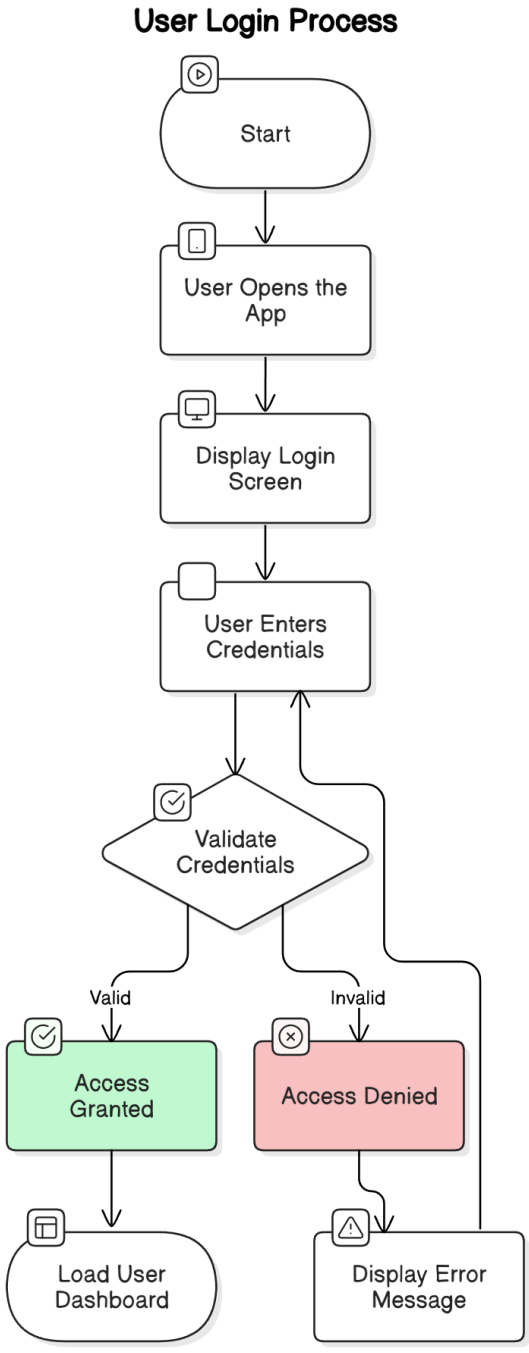

Fig. 1 Flowchart showing authentication steps design

Frontend Development

The frontend was developed using React components within Next.js pages. The main components include the dashboard, where users can select a job role and experience level and start a mock interview, and the interview simulation page, which displays questions and provides input fields for users to type their answers. State management was handled using React hooks to maintain the application's state across components.

Results

The AI Interviewer Mocker application successfully provides a platform for users to practice job interviews in a simulated environment. Upon logging in, users can select their desired job role and experience level from a predefined list. Once selected, they can start the mock interview, where they are presented with a series of questions generated by Gemini AI.

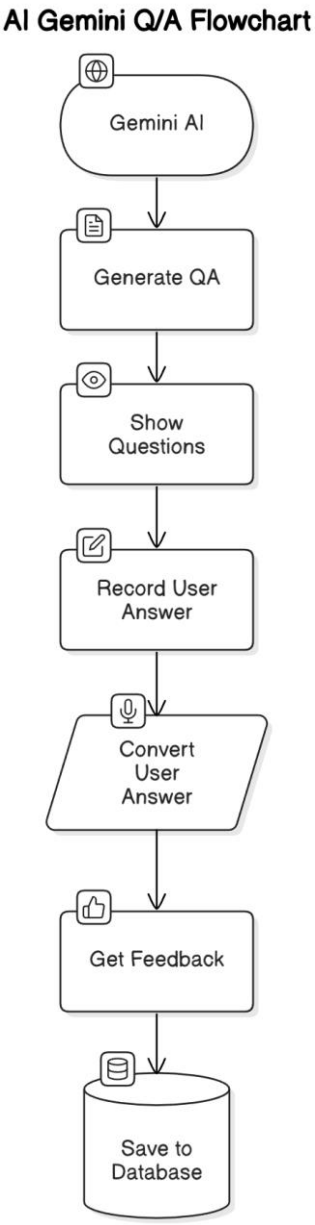

Fig. 2 A flowchart showing the steps from user selecting role to receiving questions and submitting answers.

During the interview simulation, users can speak to type their answers to each question. After completing all questions, a summary is displayed, although in the current version, detailed feedback is not provided.

The application was tested with a group of peers who found the generated questions to be relevant and appropriately challenging for the selected roles and levels. The user interface was praised for its intuitiveness, allowing users to navigate easily through the different stages of the application.

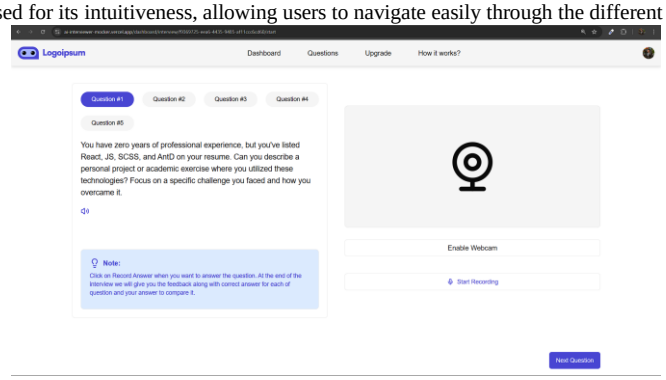

Fig. 3 A screenshot of how mock interview UI is.

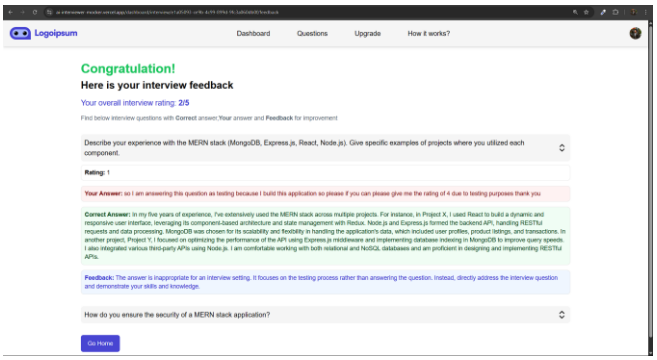

Fig. 4 A screenshot of Feedback page UI.

Discussion

The use of AI in the mock interview process offers significant advantages over traditional preparation methods. The ability to generate a wide variety of questions ensures that users are exposed to different scenarios, enhancing their readiness for actual interviews. Furthermore, the integration of natural language processing allows for questions that are contextually relevant to the user's chosen field and experience level.

However, the current implementation has limitations, primarily in the feedback mechanism. While questions are generated dynamically, the application does not yet provide detailed feedback on user responses. Future development could focus on incorporating AI models capable of evaluating answers and offering constructive criticism, thereby providing a more comprehensive learning experience.

Additionally, expanding the application to support voice-based interactions could make the simulation more realistic, as many interviews involve verbal communication. This would require integrating speech recognition and possibly text-to-speech technologies.

Conclusion

The AI Interviewer Mocker represents a significant step forward in leveraging AI for educational purposes, specifically in the realm of job interview preparation. By combining state-of-the-art web technologies with advanced language models, the application offers an interactive and effective tool for users to hone their interview skills. While the current version focuses on question generation, future enhancements aim to include sophisticated feedback systems, further enriching the user experience.

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