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Web-Based AI Mock Interview System Using ChatGPT with Real-Time Voice Interaction

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ABSTRACT: This paper introduces a web-based mock interview platform utilizing the ChatGPT API to enable real-time, interactive online interview experiences. The system supports multiple interview types—including technical and behavioral interviews—by dynamically generating tailored questions using Text-to-Speech (TTS), and evaluates users' spoken responses with Speech-to-Text (STT) for AI-driven feedback. Built with JSP and Spring Boot, the platform automatically creates diverse interview scenarios through OpenAI's ChatGPT model. User evaluations reveal high engagement and practical value, confirming the system's effectiveness for job interview preparation.

KEYWORDS: Mock Interview, ChatGPT, TTS, STT, JSP, Spring Boot, AI Interview System

I. INTRODUCTION

With rapid advances in artificial intelligence, AI-based services increasingly permeate domains such as education, healthcare, and finance. In particular, large language models (LLMs) like ChatGPT excel in natural language understanding and generation, making them highly suitable for advanced conversational applications. This research proposes a web-based mock interview system leveraging LLMs, enabling job seekers to practice interviews virtually, unrestricted by time or location. The main technical contributions are:

- Integration of the ChatGPT API to generate dynamic, context-aware interview questions and feedback.
- Flexible selection of interview types with automated, adaptive questioning.
- AI-driven assessment and feedback for user responses, supporting continuous skill improvement.
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II. RELATED WORK

Recent years have seen rapid advances in AI-powered interview platforms, driven by improvements in natural language processing and machine learning. Traditional systems, such as HireVue, JobKorea, and Saramin, laid foundations by automating interview question delivery and enabling basic video-based candidate assessments. These platforms typically rely on predefined question banks and rule-based evaluation, which limit their ability to generate dynamic scenarios or offer nuanced, personalized feedback to users.

With the introduction of large language models (LLMs) like ChatGPT, there has been a surge in research to leverage these technologies for improved interview simulations. Research by Naim et al. (2015) demonstrated automated analysis and prediction of job interview performance, while more recent works explored natural conversation generation and adaptive question formulation. EZInterviewer and ResumeVis, for instance, focus on mock interview generation and resume analytics, expanding the scope of AI involvement beyond question delivery to include in-depth linguistic and semantic analysis.

Commercial solutions now offer rich feature sets. HireVue remains widely used, providing asynchronous video interviews and basic automated scoring. Paradox (Olivia), Humanly, Harver, Sapia.ai, and Eightfold AI have introduced features such as live AI feedback, diversity hiring support, and automated transcriptions, empowering recruiters with data-driven decision-making processes. Tools like OfferGenie, InterviewSidekick, InterviewCoder, and Interview Chat focus on real-time feedback, customizable question banks, and targeted coaching, while platforms such as Interviewer.AI and Jobma have started incorporating emotion and facial expression analysis into interview assessments.

Despite these advances, there remain several limitations in existing platforms. Most struggle with assessing nuanced aspects of candidate performance, such as nonverbal cues or real-time emotional responses. Feedback mechanisms are often limited to surface-level evaluations, and context-awareness—particularly for highly specialized or technical roles—remains a challenge. Furthermore, while user satisfaction rates are high—88% recruiters report greater consistency, and 70% hiring managers praise AI standardization—there is continued demand for systems that provide more immersive, interactive, and adaptive

interviews.

Academic research is beginning to address these gaps by combining multimodal analysis (speech, video, text), sentiment detection, and progress tracking. Recent work explores the use of adaptive difficulty algorithms, real-time coaching, and domain-specific scenario generation to create a more personalized and impactful interview experience. The system proposed in this study builds on these trends, integrating ChatGPT for scenario and feedback generation, speech-to-text and text-to-speech for interactive communication, and modular architecture for flexible deployment. Such comprehensive approaches are expected to define the next wave of AI interview systems, offering actionable insights and practical value to both candidates and recruiters.

III. SYSTEM DESIGN

The proposed mock interview web service is designed with the following technical architecture and workflow.

-Frontend: JSP (JavaServer Pages)

- Provides an interface for displaying interview questions and receiving user responses.
- Utilizes TTS to convert AI-generated questions into voice.
- Uses STT to convert the user's spoken responses into text.
- Communicates with the Spring Boot backend via HTTP.

-Backend: Spring Boot

- Handles user requests and integrates with the ChatGPT API to manage interview scenarios.
- Responsible for generating interview questions, processing STT-transcribed user responses, and generating AI feedback.
- Communicates with the frontend via RESTful APIs.

- AI Engine: OpenAI ChatGPT API

- Dynamically generates interview scenarios and analyzes user text responses to provide personalized feedback.

- TTS/STT Module

- Performs TTS to deliver voice-based questions and STT to convert user speech into text.
- May use built-in browser APIs or external libraries.

- Database (Optional)

- Stores interview sessions, user answers, and feedback for later learning or review.

IV. IMPLEMENTATION

- ChatGPT API Integration: The Spring Boot backend uses an HTTP client library (e.g., RestTemplate or WebClient) to communicate with the OpenAI ChatGPT API. The API key is securely managed, and both the request and response formats are clearly defined.

- Interview Question Template Generation: The backend defines prompt templates in advance based on interview types (e.g., technical, behavioral). Depending on the user's selection, the appropriate prompt and context are sent to the ChatGPT API to generate customized interview questions.

- User Response Processing and AI Feedback Generation: The JSP frontend receives user responses converted from STT and sends them to the Spring Boot backend. The backend then forwards the textual responses to the ChatGPT API for evaluation and feedback generation. The received feedback is parsed and displayed to the user in an appropriate format.

- Spring Boot API Flow and Communication with JSP: The Spring Boot backend provides RESTful API endpoints using the @RestController annotation. The JSP pages utilize JavaScript's fetch API or jQuery ajax methods to call these endpoints and dynamically update the UI with the results.

- Voice Interface Implementation (TTS/STT):
  - TTS: The JSP frontend uses the browser's Web Speech API (SpeechSynthesis) or external TTS libraries to convert question text into spoken voice.
  - STT: The frontend uses the Web Speech API's SpeechRecognition interface to record and transcribe the user's spoken response. The transcribed text is sent to the backend for use in ChatGPT prompts.

- (Optional) Conversation Log Storage: Interview session logs may be stored in a database per user, including audio, STT transcriptions, and TTS-generated question texts for review and analysis.

V. RESULT & DISCUSSION

To validate the usefulness and effectiveness of the system, user testing was conducted.

- User Testing: A total of 10 to 20 job seekers participated in testing the mock interview system. Special emphasis was placed on evaluating their experience of listening to questions via voice and responding with their own voice.

- Survey Results: A satisfaction survey was conducted to assess the system's immersion, usefulness, and overall satisfaction. The results are summarized below.

Additionally, qualitative feedback was collected through open-ended questions. Participants noted that the ability to receive immediate AI feedback helped them reflect on their performance more effectively. Suggestions included integrating a progress tracker or confidence meter to visualize improvement over time. These user-centered insights provide meaningful directions for future enhancements.

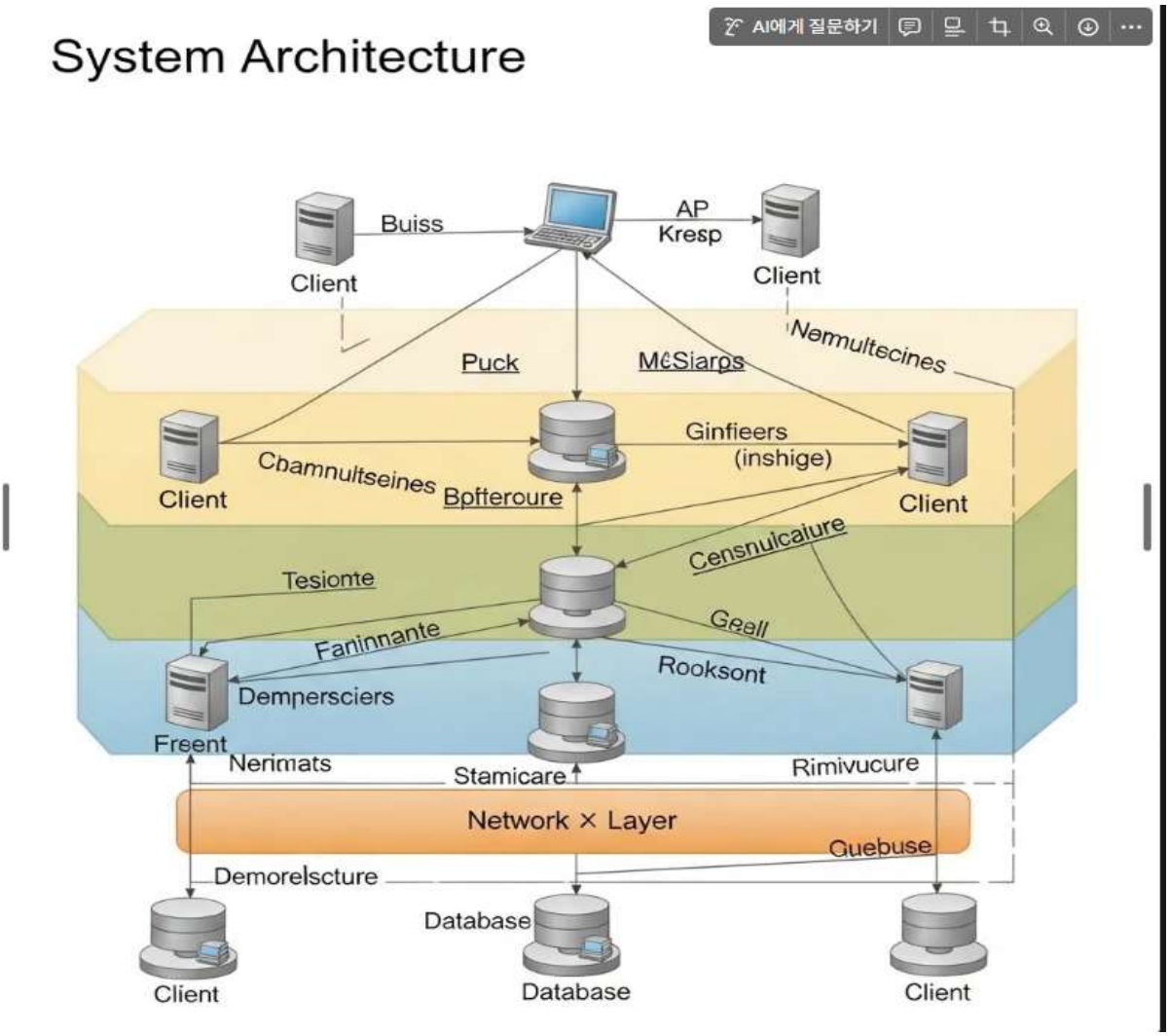

Figure 1. System Architecture

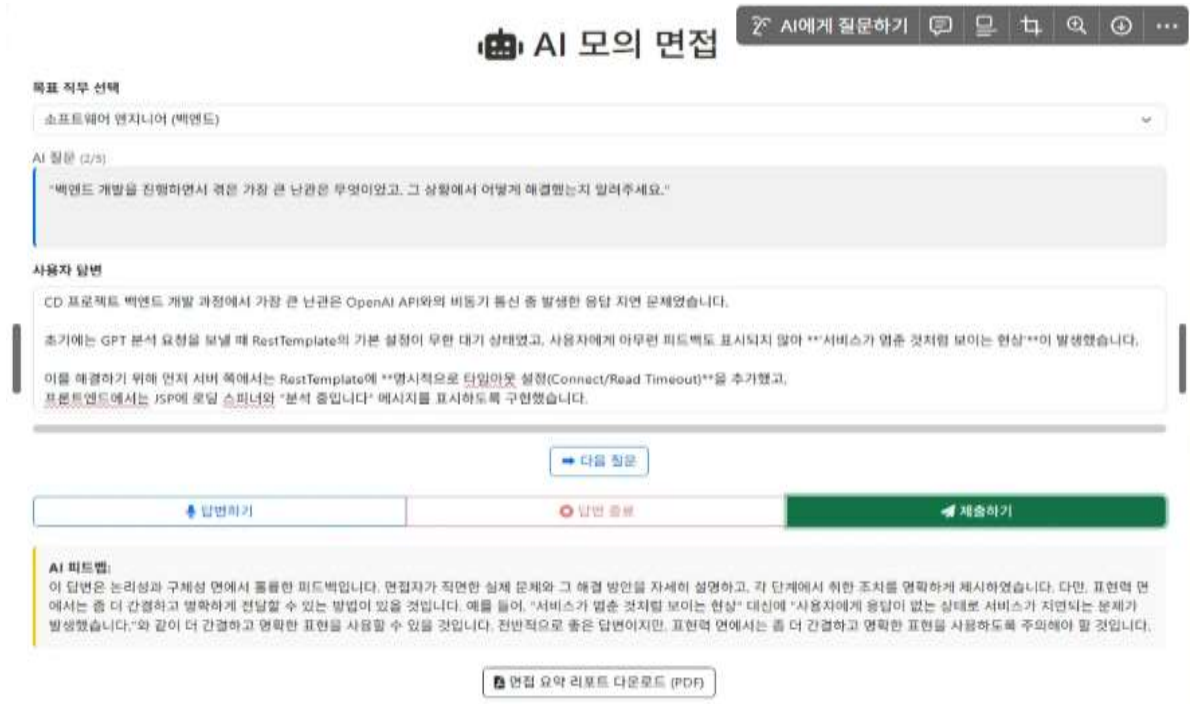

Fig. 2. System Screenshot: Mock Interview UI

Advantages:
- Repeatable Practice: Users can practice interviews anytime and anywhere.
- Real-Time Voice Interaction: The system delivers AI-generated questions via TTS and provides real-time feedback based on user STT responses, offering high immersion.
- Question Diversity: ChatGPT enables dynamic generation of various interview questions according to selected interview types.
Limitations and Future Improvements:
- STT Accuracy and Voice Naturalness: Recognition may be impacted by pronunciation and background noise, and TTS voice can sound mechanical.
- Lack of Contextual Understanding: AI cannot yet fully interpret non-verbal cues like facial expressions or subtle emotions.
- Planned Enhancements: Improve STT/TTS engine accuracy and integrate non-verbal cue analysis (emotion, expression) for a more realistic simulation.

VI. CONCLUSION

In this paper, we presented the design and implementation of a web-based mock interview system built using JSP and Spring Boot, and powered by the ChatGPT API. The proposed system delivers a wide range of interview questions in real time via TTS, accepts spoken responses, converts them into text using STT, and simulates an interactive interview experience while providing AI-based feedback. Experimental results indicated that users positively evaluated the system's practicality and its high level of immersion enabled by voice-based interaction, confirming its potential as an effective tool for job interview preparation. In future work, we aim to further enhance the accuracy and naturalness of the STT/TTS engines and integrate non-verbal behavior analysis to enable a more sophisticated and realistic interview simulation. Moreover, the combination of multimodal interfaces (voice, text) with AI-driven understanding shows potential for broader applications in education and recruitment. As AI models evolve, incorporating real-time coaching, sentiment analysis, and adaptive difficulty will create a more personalized and empowering user experience.

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