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Intelligent Interview Preparation System

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Abstract: ***Preparing for job interviews is a significant challenge for students, especially when they lack access to mentors or regular interview practice. This paper presents an AI-powered interview coaching system that automatically generates interview questions, evaluates candidate responses, and provides real-time confidence-based feedback. The system uses resume information to create personalized questions and guides users with constructive feedback based on speaking clarity, confidence level, and answer quality.***
The platform is developed using a modern web stack with a Next.js frontend and a Convex serverless backend, making it fast, scalable, and accessible across devices.
A small pilot test conducted with students indicated that the system helped reduce hesitation and improved interview readiness. The paper discusses the system architecture, module design, implementation details, and observed results. This work demonstrates how artificial intelligence can effectively support interview preparation and confidence building among learners.
Keywords: Artificial Intelligence, Mock Interview System, Generative Questioning, Confidence Detection, Resume Parsing, Natural Language Processing, Speech Analysis, Skill Recommendation, Web-based Assessment, Interview Coaching, Next.js, Human–Computer Interaction.

I. INTRODUCTION

Interviews play a crucial role in determining career opportunities, yet many students face challenges due to lack of practice, stage fear, and limited expert guidance. Traditional mock interviews depend on experienced mentors and require significant time and resources, making them inaccessible to many learners. With recent advancements in artificial intelligence, it has become possible to simulate interview environments and provide automated guidance. This project proposes an AI-powered interview coaching system that generates personalized questions, evaluates responses, and provides confidence-based feedback. The primary goal is to make interview preparation accessible, scalable, and affordable.

A. Major Contributions of this Work Include

1) Development of a complete AI-based mock interview platform.
2) Resume-driven generation of personalized interview questions.
3) Confidence evaluation using speech characteristics.
4) Scalable serverless backend architecture.
5) Pilot evaluation showing improved user confidence.

II. LITERATURE REVIEW

Several digital interview preparation tools exist; however, most rely on static question banks or lack personalized feedback. Traditional mock interviews conducted by humans are effective but limited by availability and cost. Recent approaches use chatbots or pre-recorded interviews, which provide limited adaptability. Generative AI models enable dynamic question creation based on user profiles. Additionally, speech-based confidence detection using features such as pace and pauses has gained attention. However, existing systems rarely integrate resume analysis, generative questioning, confidence detection, and feedback into a single scalable solution, motivating the proposed work.

III. SYSTEM ARCHITECTURE AND METHODOLOGY

A. Overall Architecture

The system follows a modular client-server architecture:
1) Frontend: Next.js (React-based UI)
2) Backend: Convex serverless functions
3) AI Services: Question generation and response evaluation

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4) Storage: ImageKit for resume uploads

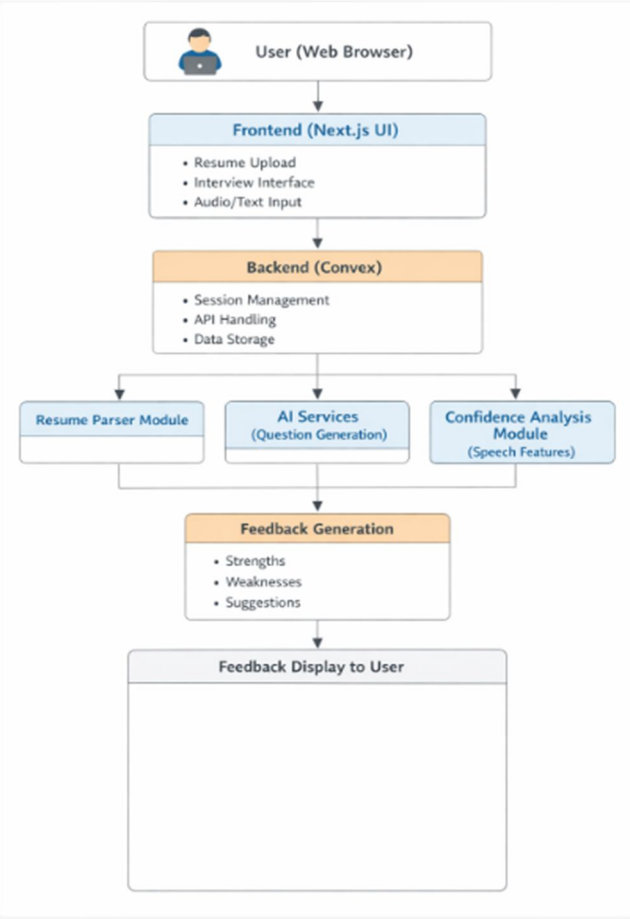
This architecture ensures scalability and cross-platform accessibility.

B. System Workflow

1) User uploads resume or selects interview domain
2) Resume is parsed to extract skills
3) AI generates interview questions
4) User responds via voice or text
5) Response is analyzed
6) Confidence score is computed
7) Feedback is displayed

C. Module Description

1) Resume Parsing Module: Extracts skills and project details.
2) Generative Questioning Module: Creates domain-specific and situational questions.
3) Confidence Detection Module: Analyzes speaking pace, clarity, pauses, and confidence.
4) Feedback Module: Provides improvement suggestions.
5) Backend Module: Manages sessions, APIs, and scalability.



IV. IMPLEMENTATION

The system is implemented using Next.js for frontend development and Convex for backend services. ImageKit handles file storage, while browser APIs are used for audio recording. AI APIs support question generation and evaluation. The interface is designed to be minimal and distraction-free.

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V. RESULTS AND DISCUSSION

Table I: User Evaluation Results

Parameter Evaluated	Observation
Question relevance	Improved compared to static questions
Confidence awareness	Users identified hesitation areas
Practice duration	10–15 minutes sufficient
System response time	Fast due to serverless backend
User feedback	Positive and motivating

The results indicate that personalized questions and immediate feedback enhance interview preparedness and reduce anxiety.

VI. CONCLUSION

This paper presented an AI-powered interview coaching system that combines resume analysis, generative question creation, confidence detection, and structured feedback within a web-based platform. The system effectively simulates key aspects of real interview scenarios while remaining easily accessible through a browser. Pilot testing showed that users experienced improved confidence, reduced hesitation, and better interview readiness after using the system.

The results demonstrate the potential of AI-based educational tools in supporting skill development and career preparation. By offering a scalable, cost-effective, and automated alternative to traditional mock interviews, the proposed system can be useful for students, training institutes, and placement preparation programs.

VII. FUTURE SCOPE

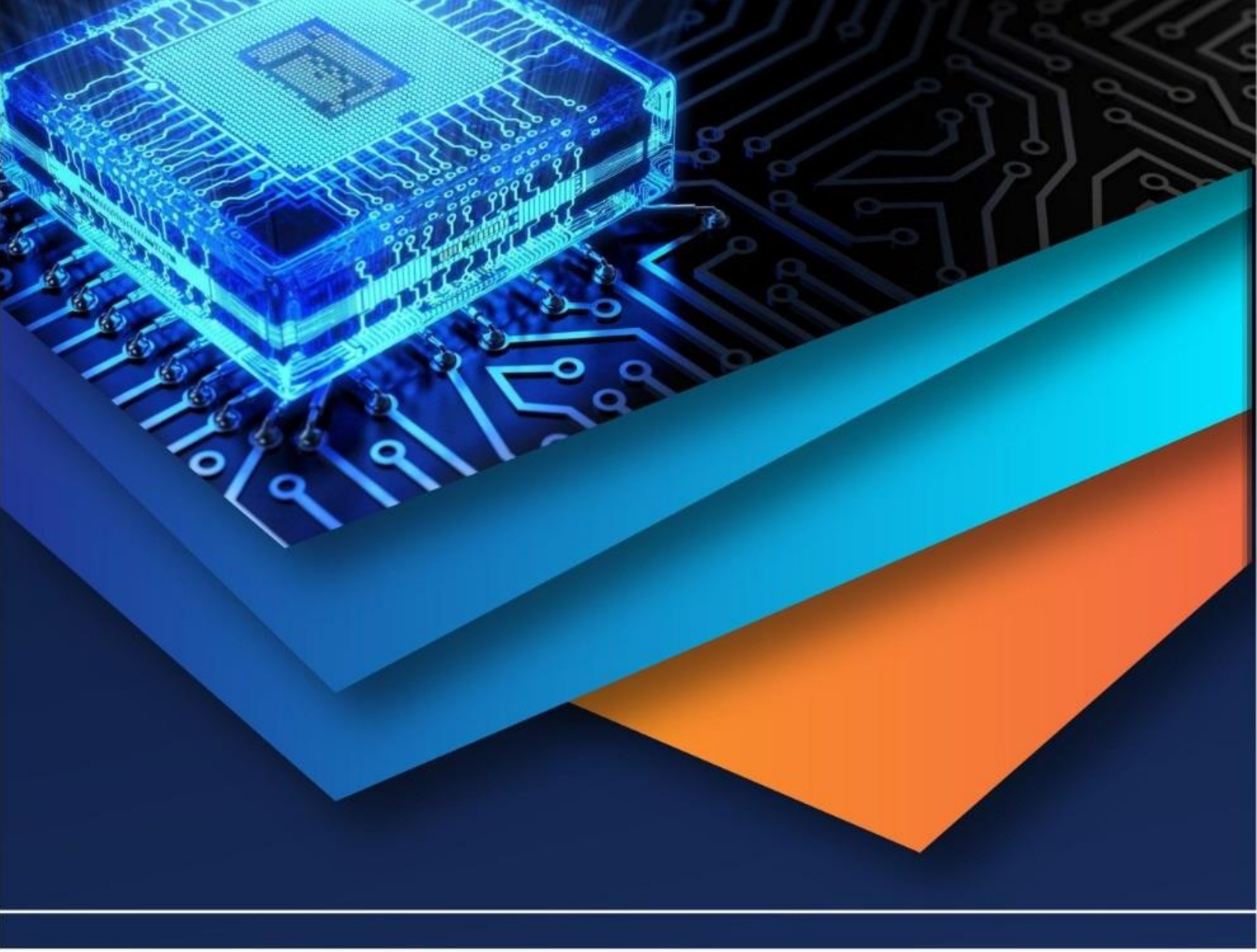
Future improvements may include real-time emotional analysis using facial expressions and eye contact to evaluate non-verbal communication during interviews. This can help users better understand their confidence level and presentation skills. The system can also be extended to support multilingual interviews, allowing users to practice in different languages.

Additionally, more advanced domain-specific AI models can be integrated to improve the quality of question generation and feedback. Integration with job portals and the development of mobile or offline versions can further increase accessibility and usability, making the system suitable for a wider range of users.

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