WWW.IJRPR.COM

International Journal of Research Publication and Reviews

Journal Homepage: www.ijrpr.com ISSN 2582-7421

Intervion AI: An AI-Based Mock Interview System for Personalized Interview Preparation

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ABSTRACT—

Interviews play an important role in determining the employability of students and job seekers, but many candidates do not have access to regular, personalized, and realistic interview practice. Traditional preparation methods such as practicing with friends, attending occasional mock interviews, using static question banks, and depending on career mentors provide useful resources but often lack continuous evaluation and personalized feedback. To address these limitations, this paper proposes Intervion AI, an AI-based mock interview system designed to provide an interactive and personalized interview preparation environment. The proposed system allows users to register, create profiles, select their preferred job role, skills, interview category, and difficulty level, and participate in AI-assisted mock interviews. The system selects or generates relevant interview questions and processes the responses submitted by users. Artificial Intelligence is used to analyze responses based on factors such as relevance, accuracy, completeness, clarity, and technical understanding. Based on the evaluation, the system generates performance scores, identifies strengths and weaknesses, and provides personalized feedback and recommendations. Interview sessions, responses, scores, and feedback are stored to support performance tracking across multiple sessions. The proposed system integrates user profiling, question generation, response evaluation, feedback generation, and performance analysis into a centralized platform, providing an accessible and structured approach to continuous interview preparation.

Index Terms—Artificial Intelligence, Mock Interview, Natural Language Processing, Interview Preparation, Response Evaluation, Personalized Feedback, Performance Analysis.

I. INTRODUCTION

The transition from academic education to professional employment requires students to possess not only technical knowledge but also communication, problem-solving, confidence, and interview skills. Interviews are commonly used by organizations to evaluate a candidate's technical knowledge, communication ability, problem-solving approach, and suitability for a particular role. However, many students, particularly those with limited exposure to professional environments, find it difficult to obtain sufficient interview practice before attending actual recruitment processes.

Traditional interview preparation generally involves question banks, online tutorials, books, peer practice, career guidance, and mock interviews conducted by faculty members or professionals. Although these methods are useful, they are often fragmented and may not provide continuous personalized evaluation. A candidate may practice several questions without knowing whether the response is relevant, complete, technically accurate, or appropriately structured. Human-based mock interviews can provide better feedback, but their availability depends on mentors, placement officers, peers, or professional trainers.

Recent research demonstrates the potential of Artificial Intelligence and Natural Language Processing to improve mock interview preparation. AI-based systems have been developed to generate interview questions, analyze candidate responses, assess communication characteristics, and provide automated feedback [1]–[3]. Recent approaches have also investigated generative AI and adaptive interview systems for personalized preparation [6], [9].

However, many existing systems concentrate on specific aspects of interview preparation, such as speech analysis, facial expression analysis, resume-based question generation, or technical assessment. This creates an opportunity for a centralized system that focuses on accessible personalized interview practice by combining user profiling, question selection or generation, response evaluation, feedback, and performance tracking.

To address this requirement, Intervion AI is proposed as an AI-based mock interview system for students and job seekers. The system provides a structured interview environment where questions can be selected according to the candidate's profile, skills, preferred role, interview category, and difficulty level. The submitted responses are analyzed using AI, and the resulting evaluation is used to generate performance scores, feedback, and recommendations.

II. PROBLEM STATEMENT

Students and job seekers often prepare for interviews using multiple independent resources. Static question banks provide questions but generally do not evaluate the quality of a candidate's response. Peer-based mock interviews provide interaction but may not offer consistent or detailed feedback. Professional mock interviews can provide valuable guidance but may be difficult to access regularly.

Another major problem is the lack of personalization. Candidates have different educational backgrounds, technical skills, experience levels, career goals, and areas of weakness. A common set of questions may therefore not be equally useful for all candidates. Candidates also need different interview categories such as technical, HR, behavioral, aptitude, and role-specific interviews.

Furthermore, candidates often lack a centralized mechanism for storing interview history and monitoring improvement. Without performance history, it becomes difficult to identify repeated weaknesses or determine whether preparation has resulted in improvement.

Therefore, there is a need for an intelligent system that can provide personalized interview questions, evaluate candidate responses, generate meaningful feedback, and track performance within a single platform.

III. PROPOSED SOLUTION

Intervion AI addresses the above problems by providing a centralized AI-assisted mock interview platform. The proposed system allows users to register and create a profile containing information such as educational background, skills, experience, preferred job role, interview category, and difficulty level.

Based on these preferences, the system selects suitable questions from the available question database or generates relevant questions using AI. During the mock interview, users submit their responses through the interview interface. The responses are then transferred to the backend and processed by the AI component.

The AI evaluates responses using criteria such as relevance, accuracy, completeness, clarity, technical understanding, and overall response quality. Based on the evaluation, the system generates scores and identifies strengths and weaknesses. It then generates personalized feedback and recommendations that can guide the candidate's future preparation.

The system stores interview sessions, responses, scores, feedback, and performance history in the database. This allows users to review previous sessions and monitor their improvement over time.

IV. OBJECTIVES

The primary objective of Intervion AI is to provide students and job seekers with an accessible and personalized environment for interview preparation.

The specific objectives of the proposed system are:

- To provide an interactive AI-based mock interview environment.
- To provide personalized interview questions based on user requirements.
- To support technical, HR, behavioral, aptitude, and rolespecific interviews.
- To evaluate user responses using Artificial Intelligence.
- To identify candidate strengths and weaknesses.
- To generate personalized feedback and recommendations.
- To maintain interview history and performance records.
- To support continuous interview preparation and improvement.

V. IMPORTANCE OF INTERVION AI

The importance of Intervion AI arises from the increasing need for continuous interview preparation among students and job seekers. Technical knowledge alone may not be sufficient for successful interviews because candidates are also expected to communicate their ideas clearly and respond appropriately to technical, behavioral, and HR questions.

Traditional mock interviews are generally limited by the availability of interviewers and time. An AI-based platform can provide practice whenever required and can evaluate responses immediately. This makes repeated practice more accessible.

Personalization is another important aspect of the proposed system. Instead of presenting identical questions to every candidate, Intervion AI considers user profile information, job role, skills, interview category, and difficulty level. This enables candidates to practice questions that are more closely related to their career requirements.

The system is also important because it provides continuous performance tracking. Candidates can review their previous results, identify repeated weaknesses, and understand their progress over time. This converts interview preparation from a one-time activity into a continuous improvement process.

VI. EXISTING SYSTEMS

Several existing platforms and research systems provide interview preparation functionality. Online coding platforms mainly focus on programming and technical problem solving, while career platforms provide job opportunities and preparation resources. Peer-based mock interview platforms provide interactive practice but depend on the availability of another participant.

Research-based AI interview systems have introduced more advanced capabilities. Salvi et al. investigated virtual simulation of technical interviews and demonstrated the potential of computer-based environments for interview practice [1]. Jin et al. investigated an agent-based virtual interview training system for students [2]. Suen et al. explored automatic personality recognition in asynchronous video interviews, demonstrating the use of automated analysis in interview assessment [3].

Recent AI-based systems have increasingly used Natural Language Processing for response analysis. AI-based mock interview research has investigated syntax and semantic analysis of candidate responses and automated evaluation [5].

Other research has combined emotion analysis, confidence evaluation, keyword mapping, and semantic analysis for mock interview evaluation [4]. Recent work has also explored generative AI, Retrieval-Augmented Generation, and adaptive interview systems for personalized interview preparation [6],

[9].

Although these systems demonstrate significant progress, many solutions concentrate on specific areas such as speech, video, emotion, or advanced model-based evaluation. Intervion AI focuses on integrating profile-based preparation, question selection or generation, response evaluation, feedback, and performance tracking within a centralized platform.

VII. LITERATURE REVIEW

Research in AI-based interview preparation has developed significantly during the last decade. Earlier systems focused mainly on virtual simulation and technical interview practice, while recent systems increasingly incorporate Natural Language Processing, Machine Learning, and generative Artificial Intelligence.

Salvi et al. investigated virtual simulation of technical interviews and demonstrated the potential of computer-based environments for providing interview practice [1]. Jin et al. developed an agent-based virtual interview training system for college students, highlighting the potential of simulated interview environments [2].

Suen et al. investigated automatic personality recognition in asynchronous video interviews [3]. Their work demonstrated how automated systems could analyze candidate characteristics from recorded interviews. These approaches expanded automated assessment beyond simple question-and-answer evaluation.

Recent research has concentrated on NLP-based response analysis. Ganeshkar et al. developed an AI-driven mock interview system using Natural Language Processing and response analysis [5]. Such approaches demonstrate that semantic and syntactic analysis can assist in evaluating candidate responses. An IEEE study on AI-based mock interview evaluation investigated emotion and confidence classification together with semantic analysis [4]. Such systems demonstrate the possibility of combining multiple AI techniques for comprehensive candidate evaluation.

Recent research has also explored generative AI for personalized interview preparation. InterviewX investigated AI-driven mock interviews using generative AI, RetrievalAugmented Generation, and Machine Learning techniques [6]. These approaches indicate a shift from fixed question banks toward dynamic and personalized interview environments.

More recent adaptive interview research has investigated the use of LLMs and Retrieval-Augmented Generation to generate customized questions and evaluate candidate responses [9]. Such developments demonstrate the increasing importance of personalization and adaptive evaluation.

The reviewed literature therefore indicates a clear movement from static interview preparation toward intelligent, personalized, and adaptive systems. However, there remains an opportunity to develop accessible platforms that integrate profile management, personalized question selection, response evaluation, feedback generation, and performance tracking within a single system.

VIII. RESEARCH GAP

Existing systems demonstrate several advanced capabilities, including speech analysis, facial analysis, emotion detection, resume-based question generation, and LLM-based evaluation. However, these capabilities are often distributed across different systems or require complex computational components.

Conventional preparation platforms continue to depend largely on fixed question banks and provide limited automated evaluation. Recent research has attempted to address this limitation using adaptive question generation and LLM-based evaluation [6], [9].

Intervion AI addresses this gap by integrating user profiling, personalized interview requirements, question selection or generation, response collection, AI-based evaluation, feedback generation, and performance tracking into one centralized platform.

IX. METHODOLOGY

The methodology of Intervion AI consists of multiple interconnected stages. The complete process is shown conceptually in Fig. 2.

A. User Registration and Authentication

The process begins with user registration. The candidate creates an account using the required credentials. The authentication module verifies the user's credentials and provides access to the personalized dashboard.

B. Profile Creation

After authentication, the user provides profile information such as educational background, technical skills, experience, preferred job role, and areas of interest. The profile information is stored in the database and used to personalize subsequent interview sessions.

C. Interview Preference Selection

The user selects the desired interview category and difficulty level. The system supports technical, HR, behavioral, aptitude, and role-specific interview categories.

D. Question Selection and Generation

The selected requirements are transferred to the backend. Suitable questions are retrieved from the question database or generated using the AI component. Questions are selected according to the user's profile and selected requirements.

E. Mock Interview

The generated or selected questions are displayed through the interview interface. The user reads each question and provides an appropriate response.

F. Response Collection

The submitted response is transferred from the frontend to the backend. The backend associates the response with the corresponding user, question, and interview session.

G. Response Processing

The response is prepared for AI-based analysis. The question and answer are considered together so that the response can be evaluated according to its context.

H. AI-Based Evaluation

The AI component evaluates the response using relevant criteria including relevance, accuracy, completeness, clarity, technical understanding, and overall quality.

I. Performance Analysis

The evaluation results are converted into performance information. The system identifies strengths and weaknesses and generates an overall performance result.

J. Feedback and Recommendations

The AI generates feedback based on the evaluation. Recommendations are provided to help the candidate improve specific weak areas.

K. Data Storage and Progress Tracking

Questions, responses, scores, feedback, and interview history are stored in the database. This information can be used to monitor progress during future interview sessions.

X. SYSTEM ARCHITECTURE

The proposed architecture consists of four major layers: frontend, backend, AI processing, and database. The architecture is illustrated in Fig. 1.

The frontend layer provides the user interface for registration, login, profile management, interview preferences, mock interviews, response submission, and result visualization.

The backend layer acts as the central communication layer. It manages authentication, user profiles, interview sessions, question requests, response submission, database operations, and communication with the AI component.

The AI processing layer performs question generation or selection, response analysis, evaluation, feedback generation, and recommendation generation.

The database layer stores user information, interview questions, responses, scores, feedback, and performance history. The overall data flow can be represented as:

User → Frontend → Backend → AI/Database → Results (1)

This architecture prevents direct communication between the frontend and database or AI services and provides a structured mechanism for managing the complete interview process.

XI. SOFTWARE IMPLEMENTATION

Intervion AI is implemented as a web-based application using modern web development technologies.

A. Frontend Implementation

The frontend is developed using React.js together with HTML, CSS, JavaScript, and Axios. It provides the registration page, login interface, dashboard, profile management, interview interface, and result display.

B. Backend Implementation

The backend is developed using Node.js and Express.js. It provides REST APIs for user authentication, profile management, interview sessions, question management, response submission, and communication with the AI component.

C. AI Integration

The AI layer is integrated with AI/LLM-based services to support question generation, response evaluation, feedback generation, and personalized recommendations.

D. Database Implementation

MySQL is used for structured data storage. The database maintains user accounts, profiles, questions, interview sessions, responses, evaluation results, feedback, and performance history.

E. API Communication

Axios is used by the frontend to communicate with the backend through REST APIs. The backend acts as the intermediate layer between the frontend, AI services, and database.

F. Development Environment

The system is developed using Visual Studio Code and managed using Git and GitHub for version control. A web browser is used to access and test the application.

XII. RESULTS AND DISCUSSION

The implemented Intervion AI system provides a complete workflow from user registration to interview performance analysis. The system integrates user management, interview preference selection, question generation, response collection, AI-based evaluation, feedback generation, and performance tracking.

A. Platform Interface Output

The platform provides a structured user interface through which candidates can register, log in, manage their profiles, select interview requirements, attend mock interviews, and access results.

B. Student Dashboard Results

The student dashboard provides access to profile information, interview preferences, available mock interviews, previous sessions, and performance information. This creates a centralized environment for interview preparation.

C. Interview Interface Results

The mock interview interface presents questions according to the selected requirements and allows users to submit responses. The interface provides a structured sequence of questions and responses.

D. Question and Response Results

The question and response module connects each user response with its corresponding interview question and session. The information is transferred to the AI component for evaluation.

E. Interview Performance Results

The performance analysis module provides an overall representation of the candidate's interview performance. The system can identify strengths and weaknesses based on response evaluation and provide suitable performance information.

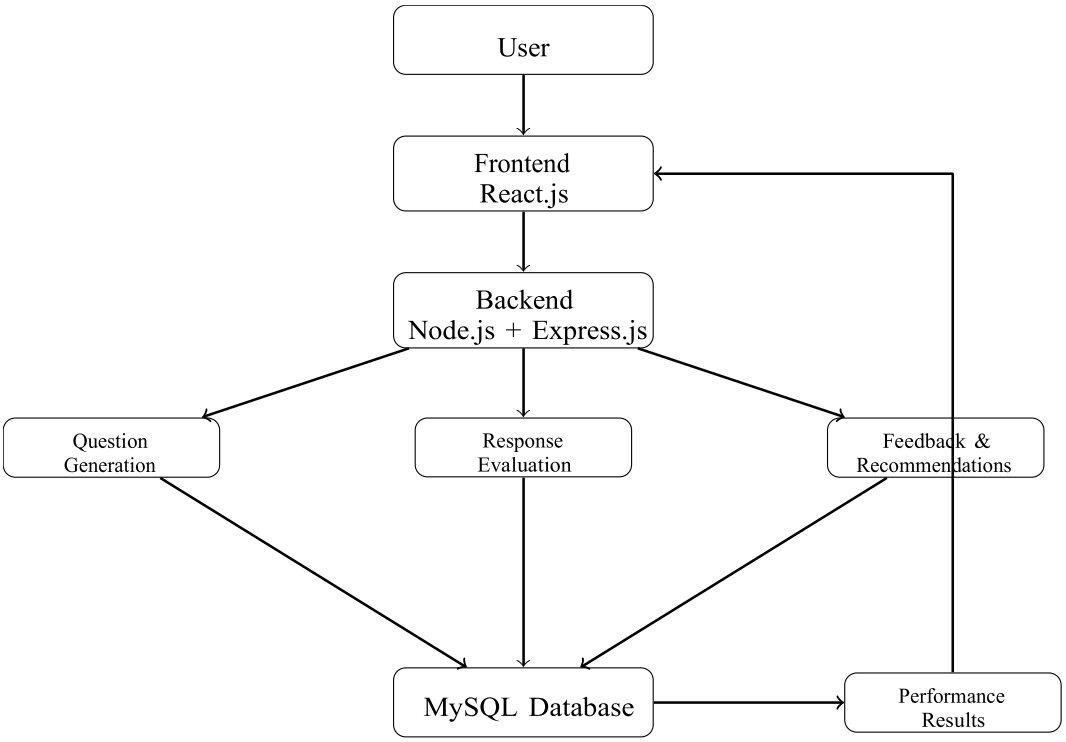


Fig. 1. System Architecture of Intervion AI

F. AI Feedback and Recommendations

The AI feedback module converts evaluation results into understandable recommendations. Instead of only providing a numerical score, the system helps candidates understand areas requiring improvement.

G. Interview History

The performance history allows candidates to access previous sessions and monitor their improvement. This provides a

foundation for continuous interview preparation.

Since the present project evaluation is primarily functional, no unsupported accuracy or user-study percentages are claimed. The results demonstrate that the proposed architecture can integrate user management, personalized interview practice, AI-based evaluation, feedback generation, and performance tracking into a single platform.

TABLE I

COMPARISON OF INTERVIEW PREPARATION APPROACHES

Feature	**Traditional Question Banks**		**AI Systems**	**Intervion AI**
User Profile	Limited	Limited	Yes	Yes
Personalized Questions	No	Limited	Yes	Yes
Role-Based Preparation	Limited	Limited	Yes	Yes
Difficulty Selection	No	Limited	Yes	Yes
AI Response Evaluation	No	No	Yes	Yes
Automated Feedback	Limited	No	Yes	Yes

Feature	**Traditional Question Banks**	**AI Systems**	**Intervion AI**	**Feature**
Performance Tracking	Limited	Limited	Yes	Yes
Interview History	No	Limited	Yes	Yes
Recommendations	No	Limited	Yes	Yes
Centralized Platform	No	Partial	Varies	Yes

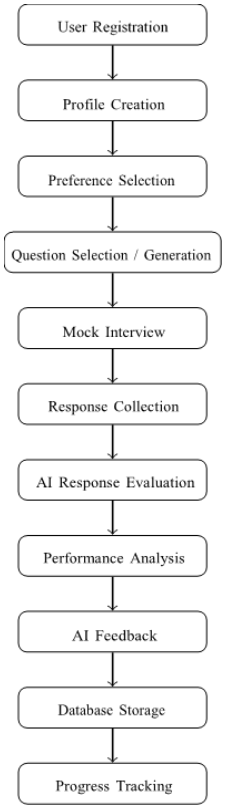


Fig. 2. Workflow of the Proposed Intervion AI System

TABLE II

MAJOR SYSTEM MODULES

Module	Primary Function
Authentication	User registration and secure login
Profile Management	Stores education, skills, experience and preferences
Question Module	Selects or generates suitable interview questions
Interview Module	Conducts the mock interview session
Response Module	Collects and stores candidate responses
AI Evaluation	Analyzes candidate responses
Feedback Module	Generates personalized feedback and recommendations
Performance Module	Calculates and displays interview performance
Database Module	Stores users, questions, responses, scores and history

XIII. ADVANTAGES

The proposed system provides several advantages for students and job seekers. Personalized question selection helps candidates practice according to their specific requirements. Automated response evaluation provides immediate assessment without requiring continuous human intervention. AIgenerated feedback helps candidates understand their strengths and weaknesses.

The centralized architecture reduces the need to depend on multiple preparation resources. Performance history allows candidates to track improvement, while personalized recommendations provide guidance for future preparation. The system also enables repeated practice, making interview preparation more accessible and convenient.

XIV. LIMITATIONS

Although Intervion AI provides an integrated interview preparation environment, certain limitations remain. AI-based evaluation may not always perfectly understand subjective or highly varied responses. The quality of generated questions and feedback can also depend on the AI service being used.

The current implementation primarily focuses on text-based interview interaction. Advanced speech analysis, facial analysis, emotion detection, and video-based assessment are not considered core components of the present system.

The system also requires further validation through largerscale user studies to evaluate how effectively repeated use improves actual interview performance.

XV. FUTURE ENHANCEMENTS

Future versions of Intervion AI can incorporate voicebased mock interviews and speech processing to evaluate fluency, pronunciation, pauses, and communication patterns. Video-based interview simulation could additionally analyze presentation and non-verbal communication.

Resume-based question generation can be introduced so that the system generates questions from the candidate's education, projects, skills, and experience. Job-descriptionbased interview generation could further improve the relevance of questions by matching candidate skills with specific job requirements.

Adaptive difficulty can also be implemented so that the system automatically increases or decreases question difficulty based on previous performance. Multilingual interview support could make the platform more accessible to candidates from different linguistic backgrounds.

Advanced analytics could provide skill-wise performance trends, long-term progress graphs, and detailed recommendations. Mobile application support could further increase accessibility.

Recent research is moving toward adaptive, resume-centric, and LLM-based interview preparation, making these directions relevant for future development [9], [10].

XVI. CONCLUSION

Intervion AI presents an AI-based approach to improving interview preparation for students and job seekers. Traditional interview preparation methods often provide fragmented resources, limited personalization, and insufficient continuous feedback. The proposed system addresses these limitations by providing a centralized environment for personalized mock interviews, response evaluation, feedback generation, and performance tracking.

The system allows users to create profiles, select interview requirements, receive relevant questions, submit responses, and obtain AI-based evaluation. The generated scores, feedback, strengths, weaknesses, and recommendations help candidates understand their performance and identify areas requiring improvement.

The integration of user profiling, question selection and generation, response processing, AI evaluation, performance analysis, and database management provides a structured interview preparation workflow. The system therefore demonstrates how Artificial Intelligence can be applied to make interview preparation more accessible, interactive, and personalized.

Future integration of speech processing, resume-based question generation, adaptive difficulty, multilingual support, and advanced analytics can further enhance the capabilities of the platform. Overall, Intervion AI provides a practical foundation for an intelligent interview preparation system and demonstrates the potential of AI-assisted technologies in supporting career readiness.

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