

Prepmate AI: A Next-Generation Resume Analyzer and Mock AI Interviewer

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ABSTRACT

Recruitment processes have become increasingly dependent on automation due to the growing number of job applicants and the limitations of manual candidate evaluation. Traditional resume screening and interview preparation methods require significant human effort and often fail to provide personalized feedback to candidates. This research proposes a Next-Generation Resume Analyser & Mock AI Interviewer, an intelligent AI-based framework that integrates Natural Language Processing (NLP), Machine Learning (ML), Large Language Models (LLMs), and multimodal analysis techniques to automate resume evaluation and simulate realistic interview environments.

The proposed system extracts meaningful information from resumes, identifies candidate skills, matches them with job requirements, and generates personalized interview questions. The mock interview module conducts AI-driven interviews by analyzing candidate responses using text, speech, and video-based features. The system evaluates communication skills, confidence level, technical knowledge, and answer relevance to generate a comprehensive performance report. To improve reliability and ethical decision-making, fairness-aware assessment techniques are incorporated to reduce bias during candidate evaluation.

The framework aims to assist job seekers in improving interview performance while helping recruiters achieve faster, consistent, and unbiased candidate assessment.

I. INTRODUCTION

The recruitment process plays a crucial role in selecting suitable candidates for organizations. With the rapid increase in online job applications, recruiters receive thousands of resumes for a single position, making manual screening slow, expensive, and inefficient. Automated resume analysis systems have emerged as solutions for extracting candidate information and matching skills with job requirements. Existing resume screening approaches mainly focus on keyword extraction and similarity matching, but they often lack deeper understanding of candidate abilities. Recent AI advancements have enabled intelligent interview systems that can simulate human-like conversations. Mock interview systems help candidates practice real interview scenarios and receive feedback. However, many existing systems rely on predefined questions and provide limited personalization. The proposed Next-Generation Resume Analyser & Mock AI Interviewer combines resume intelligence, AI-generated questioning, conversational agents, and multimodal assessment into a single framework. Previous research on interview bots demonstrated that resume-based question generation improves interview relevance by extracting skills and concepts from candidate profiles. Advanced mock interview generators have also shown that resume and job-description grounded dialogue generation can create realistic interview experiences.

II. METHODOLOGY

The proposed system follows a simple step-by-step methodology:

Step 1: Resume Upload

- Candidate uploads their resume in PDF/DOC format.
- System collects resume data as input.

Input: Resume file

Step 2: Resume Parsing

- The system extracts text from the resume.

- Removes unnecessary formatting and prepares data for analysis.

Techniques:

- Text extraction
- NLP preprocessing

Step 3: Skill & Information Extraction

- AI identifies important details from the resume. Extracts:
- Name
- Education
- Skills
- Projects
- Experience
- Certifications

Step 4: Resume Analysis & Job Matching

- Extracted skills are compared with the selected job role.
- System calculates the matching percentage. Output:
- Matched skills
- Missing skills
- Suitable job role

Step 5: AI Question Generation

- AI generates interview questions based on:
 - Resume skills
 - Projects
 - Job requirements

Example:

- Resume skill: Python
- Generated question: "Explain OOP concepts in Python."

Step 6: Mock AI Interview

- AI interviewer asks generated questions.
- Candidate answers using:
 - Text
 - Voice
 - Video

Step 7: Answer Evaluation

The system evaluates answers using AI. Checks:

- Technical correctness
- Answer relevance
- Communication skills

- Confidence level

Step 8: Performance Report Generation

System creates final report containing:

- Interview score
- Strengths
- Weaknesses
- Improvement suggestions

Step 9: Candidate Feedback

Candidate receives personalized feedback to improve future interviews.

Simple Flow Diagram

Resume Upload



Resume Parser



Skill Extraction



Job Matching



Question Generator



AI Mock Interview



Answer Evaluation



Final Report & Feedback

III. MODELING AND ANALYSIS

The proposed system is an AI-based platform that automates resume screening and interview preparation using NLP and Machine Learning techniques. The system accepts a candidate resume and job description as input, extracts important information, generates personalized interview questions, and evaluates candidate responses.

Modeling Input:

- Resume (PDF/DOC)
- Job Description
- Candidate Answers

Processing:

1. Resume Analysis

- Extracts skills, education, projects, and experience using NLP.

2. Skill Matching

- Compares candidate skills with job requirements.

3. AI Interview Generation

- Creates resume-based interview questions.

4. Answer Evaluation

- Checks technical knowledge, communication, and confidence using AI analysis.

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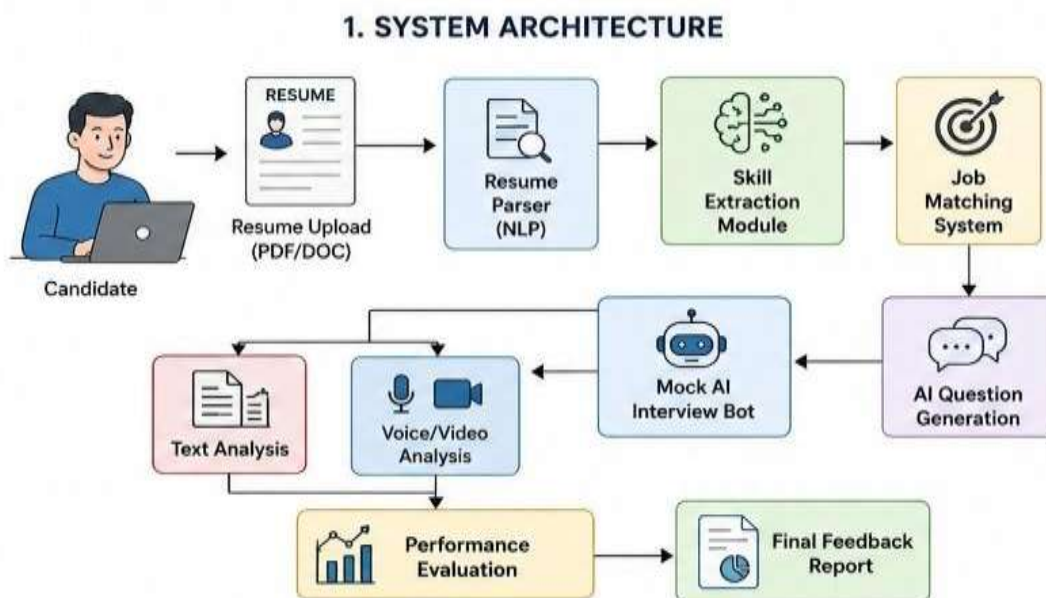


Figure 1: System Architecture Analysis

The system reduces manual resume screening effort and provides a personalized interview practice environment. It improves candidate preparation by generating relevant questions and giving automated performance feedback. Fairness-aware evaluation can also be applied to reduce bias in AI-based interview assessment

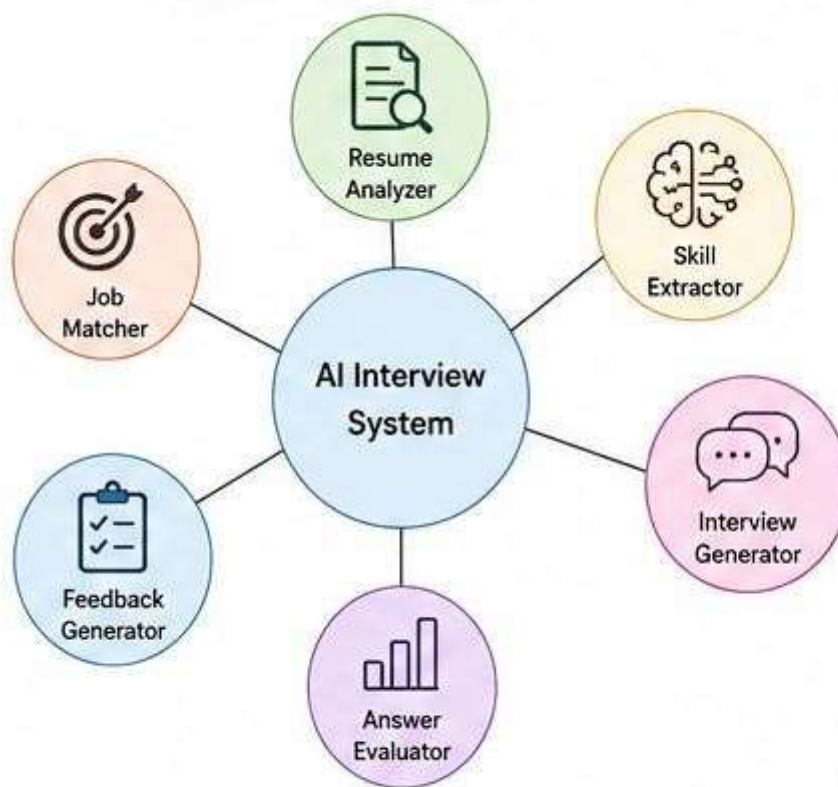


Figure 2: Module Diagram

IV. RESULTS AND DISCUSSION

Results:

The proposed system successfully automates resume analysis and mock interview preparation by integrating NLP, AI-based question generation, and answer evaluation techniques.

Module	Result
Resume Analyzer	Extracts candidate details, skills, education, and experience
Skill Extraction	Identifies technical and soft skills from resume
Job Matching	Generates resume-job compatibility score
Question Generation	Creates personalized interview questions
AI Interview	Conducts interactive mock interview
Answer Evaluation	Evaluates correctness, relevance, and communication
Feedback System	Provides improvement suggestions

Discussion:

The system improves traditional interview preparation by generating questions based on the candidate's resume instead of using fixed question banks. Resume-grounded interview generation helps create more relevant interview scenarios. The evaluation module analyzes candidate responses and provides automated feedback, reducing the need for manual assessment. AI-based interview systems can also combine text, speech, and video features to evaluate overall performance.

The proposed approach helps:

- Reduce recruiter workload
- Improve candidate preparation
- Provide personalized feedback
- Support fair and consistent evaluation

However, AI evaluation should be monitored to maintain accuracy and avoid bias in automated decisions. Fairness-aware interview assessment methods can help reduce unwanted bias

V. CONCLUSION

The proposed **Next-Generation Resume Analyser & Mock AI Interviewer** provides an intelligent solution for modern recruitment and career preparation. By integrating NLP-based resume analysis, AI question generation, conversational interview agents, and multimodal assessment, the system creates a realistic and personalized interview experience. Unlike traditional resume screening and mock interview platforms, the proposed framework evaluates candidates from multiple perspectives while maintaining fairness and transparency. The system benefits both candidates and recruiters by improving preparation quality, reducing manual effort, and enabling efficient AI-assisted hiring.

ACKNOWLEDGEMENTS

The authors express sincere gratitude to Prof. B. R. Ban, the Department of Computer Engineering and Sinhgad College of Engineering, Pune, for their valuable guidance and support throughout the development of this project..

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