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AI-Interview Performance Analyzer Using Python

MR Noor Ahamed J, Maheshwaran. R

[1]Associate professor, Department of Computer Applications, Nehru College of Management, Coimbatore, Tamil Nadu, India,ncmnoorahamed@nehrucolleges.com,

[2]Student of II MCA, Department of Computer Applications, Nehru College of Management, Coimbatore, Tamil Nadu, India, waranm408@gmail.com

Abstract:

In today's recruitment process, fairly and consistently evaluating interview performance remains a significant challenge due to human bias. To tackle this, the project introduces an AI-Interview Performance Analyzer.a webbased intelligent system that evaluates candidates through aptitude tests and live interview analysis.

The system administers timed, multi-level aptitude tests and records live interviews using webcam technology. AI-driven scoring algorithms assess both the aptitude test results and the interview performance to produce a comprehensive evaluation score.

The application ensures secure access with OTP-based password recovery and provides role-specific dashboards for both candidates and administrators. Administrators can efficiently manage users, aptitude questions, interview recordings, and result reports. The system is built using HTML, CSS, and
JavaScript for the frontend, Python (Flask) for the backend, and MySQL for data storage. This solution enhances the accuracy, transparency, and efficiency of the recruitment process by offering a fair and automated method of evaluating interviews.

Recruitment interviews frequently rely on human judgment, which can result in bias and uneven assessments. The AI-Interview Performance Analyzer is a web-based tool designed to automate and streamline the interview evaluation process. It assesses candidates through aptitude tests and recorded live interviews.
These aptitude tests are timed and consist of multiple levels, while interviews are conducted using webcam technology. AI-driven scoring methods evaluate both the aptitude test results and interview performance to calculate a total score and determine the candidate's selection status.

The system features secure login, OTP-based password recovery, and distinct dashboards for users and administrators. This tool assists recruiters in making fair and precise hiring decisions. keywords:

AI Interview Analyzer, Aptitude Test, Performance Evaluation, Flask, MySQL, Recruitment System, Web Application.

1.INTRODUCTION:

In today's highly competitive job market, the recruitment and interview process are essential in identifying the right candidates. Traditional methods of evaluating interviews heavily rely on human judgment, which can result in bias, inconsistency, and unreliable assessments. Furthermore, manual interview procedures are labor-intensive and challenging to manage when dealing with a large volume of applicants.

With the fast-paced development of Artificial Intelligence (AI) and web-based technologies, automated interview evaluation systems have become increasingly important. AI allows for more objective assessments by analyzing quantifiable factors such as test scores, response times, and interview behavior.

Online platforms further streamline the recruitment process by enabling candidates to take tests and participate in interviews remotely.

The AI-Interview Performance Analyzer is a web-based tool designed to automate and standardize the evaluation of interviews. The system administers timed, multi-level aptitude tests and records live interviews using webcam technology. AI-driven scoring algorithms assess both the candidate's aptitude results and interview performance to calculate an overall score. The application also offers secure authentication, OTP-based

password recovery, and role-specific dashboards for both candidates and administrators.

By minimizing human bias and reducing the need for manual intervention, this system enhances the accuracy, transparency, and efficiency of the recruitment process, making it well-suited for modern businesses and educational institutions.

2.PROPOSED METHODOLOGY:

The AI-Interview Performance Analyzer aims to streamline and digitize the hiring process by offering an impartial, automated assessment of applicants. The approach emphasizes minimizing manual tasks, removing human bias, and keeping candidate information in a secure, centralized database. **I. User Onboarding and Authentication:**

At the start, candidates and administrators register in the system using their personal information and secure login details. To protect data, the system uses OTP-based email verification, which ensures only authorized users can access the platform for testing or management.

II. Aptitude Testing and Automated Evaluation:

After logging in, candidates take a timed aptitude test. The system identifies the difficulty level and automatically evaluates the answers after submission. This stage serves as a primary filter, making sure only candidates who meet a certain standard move on to the interview stage.

III. Live Interview Recording and AI Analysis:

During the interview, the system uses webcam APIs to record the candidate's live session while showing structured questions. The AI analyzes factors such as answer accuracy, confidence levels, and communication clarity. This digital observation replaces traditional paper notes, ensuring that evaluations are consistent across all candidates.

IV. Performance Reporting and Monitoring :

he application processes all data from the aptitude test and live interview to create a Final Result Report. Administrators can log in anytime to monitor overall recruitment activity, view interview recordings, and download detailed performance summaries.

Parameter	Existing System	Proposed System
Recruitment Management	Manual planning and coordination	Automated digital scheduling
Evaluation Method	Paper-based and manual process	Systemdriven webbased process
Data Usage	Limited and fragmented records	Centralized digital recruitment data
Candidate Support	No access to past scores	Access to detailed performance history

3. SYSTEM ARCHITECTURE:

The AI-Interview Performance Analyzer utilizes a three-layered architecture that distinctly divides the user interface, application logic, and data storage components. This structured approach ensures high performance, scalability for multiple candidates, and secure data handling during live evaluations.

A. Presentation Layer (User Interface): The presentation layer provides dedicated dashboards for **Admin** and **Candidate** users. It supports all front-end interactions, including

- Registration and Secure Login
- Aptitude Interface
- Live Interview Portal
- Result Visualization

B. Application Logic Layer:

This layer is the core of the system, powered by **Python Flask**. It processes requests from the user interface and manages the system's intelligent features:

- Authentication Control
- AI Evaluation Engine
- Notification Management

C. Database Storage Layer:

The database layer, implemented using **MySQL**, is responsible for the persistent storage of all critical system data:

- User Profiles
- Question Bank
- Performance Records
- Data Integrity

4. DATASET DESCRIPTION:

The AI-Interview Performance Analyzer utilizes a structured database to manage candidate information, assessment questions, and performance results. The dataset is stored in a **MySQL** database, ensuring secure data handling and efficient retrieval for recruitment monitoring. The data is generated through interactions between the **Admin** and **Candidate** users

A. Data Categories:

The dataset consists of several interconnected tables designed to support continuous performance tracking:

- User Data- Includes candidate ID, name, age, contact information, and login credentials.
- Aptitude Data- Contains the question bank, difficulty levels, correct answers, and candidate-specific aptitude scores.
- InterviewData-Stores interview question IDs, video recording links, and timestamps of the session.
- AI Analysis Data- Includes calculated metrics such as confidence scores, accuracy percentages, and final selection status

B. Data Security and Backup:

All candidate records and interview performance data are stored securely to prevent unauthorized access. To ensure system reliability, the data is safely backed up and can be recovered in the event of technical failures or system crashes.

C. Dataset Attributes:

Attribute	**Description**
Data Access	Admins manage the overall system and view all reports, while candidates can only access their personal results
Data Access	The system validates input during aptitude tests and registration to prevent incomplete or incorrect information.
Data Consistency	All records are stored in a centralized MySQL database to ensure uniform and correct information for analysis.
Data Availability	Recruitment data is accessible 24/7 through the web interface for authorized users.

5.FLOWCHART:

The flowchart of the **AI-Interview Performance Analyzer** illustrates the step-bystep interaction between the Admin and Candidate to manage the recruitment process and performance evaluation. The system operation is divided into the following major stages

A. User Registration and Login:

Candidates and Admins register using valid personal details. After successful registration, users log in using secure authentication credentials to access features based on their roles.

B. Admin Management:

The Admin logs into the dashboard to manage the aptitude question bank and interview parameters. The Admin also initiates the OTP-based verification for new registrations to ensure secure access.

C. Candidate Assessment (Aptitude):

Candidates log into the system to take a time-based aptitude test. The system automatically evaluates the responses and stores the scores in the centralized MySQL database.

D. Live Interview Session:

Candidates proceed to the interview module where the system displays questions and captures a live session via webcam. The AI scoring logic then analyzes the performance based on predefined metrics.

E. Performance Record Storage:

All assessment data, including aptitude scores and interview metrics, are stored securely in the database. These records are linked to candidate profiles to ensure continuous history tracking.

F. Logout and Monitoring:

After completing the assessment, users log out. The Admin continuously monitors overall system activity, updates assessment data, and analyzes final results to ensure smooth recruitment operations.

6.FUTURE ENHANCEMENTS:

The **AI-Interview Performance Analyzer** can be further improved by integrating advanced features to enhance its evaluation accuracy and user accessibility. Future work may include the following developments:

- **Advanced AI Analysis**- ntegration of facial expression analysis and emotion detection to better assess a candidate's soft skills and stress management during the interview.
- **Speech-to-Text and NLP**- Implementing Natural Language Processing (NLP) to transcribe interview audio into text, allowing for automated keyword matching and more precise answer evaluation.
- **Real-Time Interview Feedback**- The system can be enhanced to provide real-time feedback during interviews, such as alerts for speaking speed, voice clarity, and eye contact.
- **Adaptive Aptitude Testing**- Aptitude tests can be made adaptive, where the difficulty level of questions dynamically changes based on the candidate's performance.
- **Advanced Admin Analytics** Dashboard- Future enhancement includes detailed analytics dashboards with charts and performance trends for administrators.

8. CONCLUSION:

The **AI-Interview Performance Analyzer** provides an effective and intelligent solution for modern recruitment systems by automating the interview evaluation process. By integrating aptitude testing, live interview recording, and AI-based performance analysis, the system ensures objective and consistent assessment of candidates. The use of secure authentication, role-based access, and automated result generation reduces human bias and manual effort.

The proposed system improves recruitment efficiency by providing accurate performance reports and supporting better decision-making for administrators. Its web-based architecture allows candidates to attend tests and interviews remotely, making the system scalable and userfriendly. Overall, the AI-Interview Performance Analyzer enhances transparency, reliability, and effectiveness in the interview process and serves as a strong foundation for future AI-driven recruitment platforms.

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