

AI Based Mock Interview Evaluator

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Abstract – The integration of Artificial Intelligence (AI) in the recruitment process has led to the development of advanced tools aimed at enhancing interview assessment and candidate evaluation. This paper introduces an AI-driven mock interview evaluator designed to simulate real-world interview scenarios while providing comprehensive performance analysis. Utilizing machine learning algorithms and natural language processing (NLP) techniques, the system delivers real-time feedback to candidates, facilitating a more effective and insightful interview preparation experience.

The proposed system supports both video and audio-based interview modes, offering flexibility to accommodate individual preferences and ensuring a seamless user experience. During the interview, real-time facial expression analysis captures emotional cues, contributing to a holistic evaluation of candidate demeanor and engagement.

Upon completion, candidates receive instant feedback along with detailed performance visualizations, enabling comparative analysis across multiple interview sessions. These insights help candidates identify strengths, pinpoint areas for improvement, and track their progress over time, ultimately enhancing their readiness for real-world job interviews.

Key Words: Artificial Intelligence, Mock Evaluator, CNN, Pydub, Real-Time Camera, Neural Networks, Web Interface

1. INTRODUCTION

AI-based mock interview evaluators have become a game-changer for job seekers looking to improve their interview skills. These tools use Artificial Intelligence to provide realistic and unbiased assessments, helping candidates practice and refine their performance. Unlike traditional mock interviews, AI evaluators are available anytime, making it convenient for users to prepare at their own pace.

These AI-driven simulations closely resemble real interviews, including industry-specific questions that help candidates get a feel for what to expect. They don't just assess answers—they also analyze problem-solving skills, body language, and emotional cues. This well-rounded feedback helps users recognize their strengths and identify areas that need improvement.

What makes AI evaluators stand out is their fairness. Since they rely on AI, they eliminate human biases, ensuring objective assessments. Along with feedback, they often provide personalized suggestions and resources to help users sharpen their skills. Candidates can also track their progress over time, making it easier to measure improvement.

By allowing job seekers to practice repeatedly and receive constructive feedback, AI-based mock interview evaluators boost confidence and readiness. In today's competitive job market, they serve as a valuable tool to help individuals perform their best in real interviews.

2. Objectives

1. **Real-time Video & Audio Analysis** – Use live camera and mic to assess speech, facial expressions, and body language.
2. **AI-Generated Questions** – Provide relevant interview questions based on user input.
3. **Instant Performance Feedback** – Evaluate communication skills, confidence, and emotional expression after the interview.
4. **Emotion Tracking with Graphs** – Visualize emotion changes throughout the interview.
5. **Personalized Improvement Tips** – Offer tailored suggestions to enhance speaking clarity, confidence, and body language.
6. **AI-Based Evaluation Without Preference** – Ensure fair and objective assessments based solely on data, without human influence.

2. LITERATURE SURVEY

The use of artificial intelligence (AI) in recruitment processes has gained significant attention in recent years due to its potential to enhance efficiency, objectivity, and effectiveness. Traditional interview methods, while valuable, often suffer from biases, subjectivity, and time constraints. This section reviews relevant literature on AI in recruitment, interview evaluations, and existing mock interview tools

1. AI in Recruitment:

Several studies have explored the integration of AI into recruitment processes to improve candidate selection. According to Smith et al. (2019), AI algorithms can analyze large datasets to identify patterns and predict candidate success, leading to more informed hiring decisions. However, the interview stage remains a critical aspect of the recruitment process, requiring a deeper examination.

2. Interview Evaluation Challenges:

Interview evaluations are subjective and prone to biases, impacting the overall quality of candidate assessments. The need for a standardized and unbiased evaluation method has led to the exploration of AI-based solutions.

3. Mock Interview Tools:

Existing mock interview tools primarily focus on providing practice scenarios for candidates rather than comprehensive evaluations. Platforms like Interview Buddy and Pramp offer simulated interviews but lack sophisticated AI capabilities for in-depth analysis. These tools have proven valuable for candidate preparation but fall short in providing actionable feedback and objective evaluations.

4. AI-Based Assessment Tools:

Recent developments in natural language processing (NLP) and machine learning (ML) have paved the way for AI-based assessment tools. Smith and Wang (2020) demonstrated the effectiveness of NLP algorithms in analyzing interview responses, identifying communication patterns, and assessing candidate suitability. However, these studies often lack a holistic approach to the mock interview process.

5. Integration of AI in Mock Interview Evaluations:

The integration of AI in mock interview evaluations has the potential to address the limitations of existing tools. Chen et al. (2021) proposed an AI-driven mock interview evaluator that combines NLP and sentiment analysis to assess both verbal and non-verbal cues. The study highlighted improved objectivity and consistency in evaluations, suggesting a promising direction for future research.

3. PROBLEM DEFINATION

This research paper focuses on improving the interview evaluation process using Artificial Intelligence (AI). Traditional interview assessments often have issues like human bias, inconsistency, and slow feedback, making the hiring process less effective. This paper explores an AI-based mock interview evaluator as a solution to these problems.

It looks at key challenges such as unfair evaluations, the lack of real-time feedback, slow manual assessments, and the need for a system that works across different job roles. By using AI, the goal is to reduce bias, provide instant feedback, automate evaluations, and adapt to various industries. This research aims to improve how interviews are assessed and make hiring more efficient.

4. PROPOSED WORKING

1. Choosing Interview Mode:

Candidates first decide whether they want a video or audio interview based on their preference and the interview type.

2. Starting the Interview:

Once the mode is selected, candidates start the interview. In video mode, the camera turns on, while in audio mode, only the microphone is used.

3. Answering Questions:

Candidates respond to interview questions within the given time. The system records both video and audio for video interviews, while audio interviews capture only voice responses.

4. Facial Expression Analysis (For Video Interviews):

During video interviews, the system tracks facial expressions in real-time to understand emotions and non-verbal communication.

5. Generating Feedback:

After the interview, the system gives personalized feedback based on spoken answers, facial expressions (for video), and overall performance.

6. Comparing Performance:

The system shows a comparison between the current and past interviews, helping candidates see progress and areas to improve.

7. Instant Feedback:

Candidates get immediate feedback to assess their performance and improve their interview skills. The feedback is clear, helpful, and specific.

8. Continuous Improvement:

Using the feedback, candidates can practice and refine their communication, confidence, and overall interview performance for future interviews.

9. Easy-to-Use Interface:

The system ensures a smooth and user-friendly experience, making it easy for candidates to go through the interview process without confusion.

System Architecture:

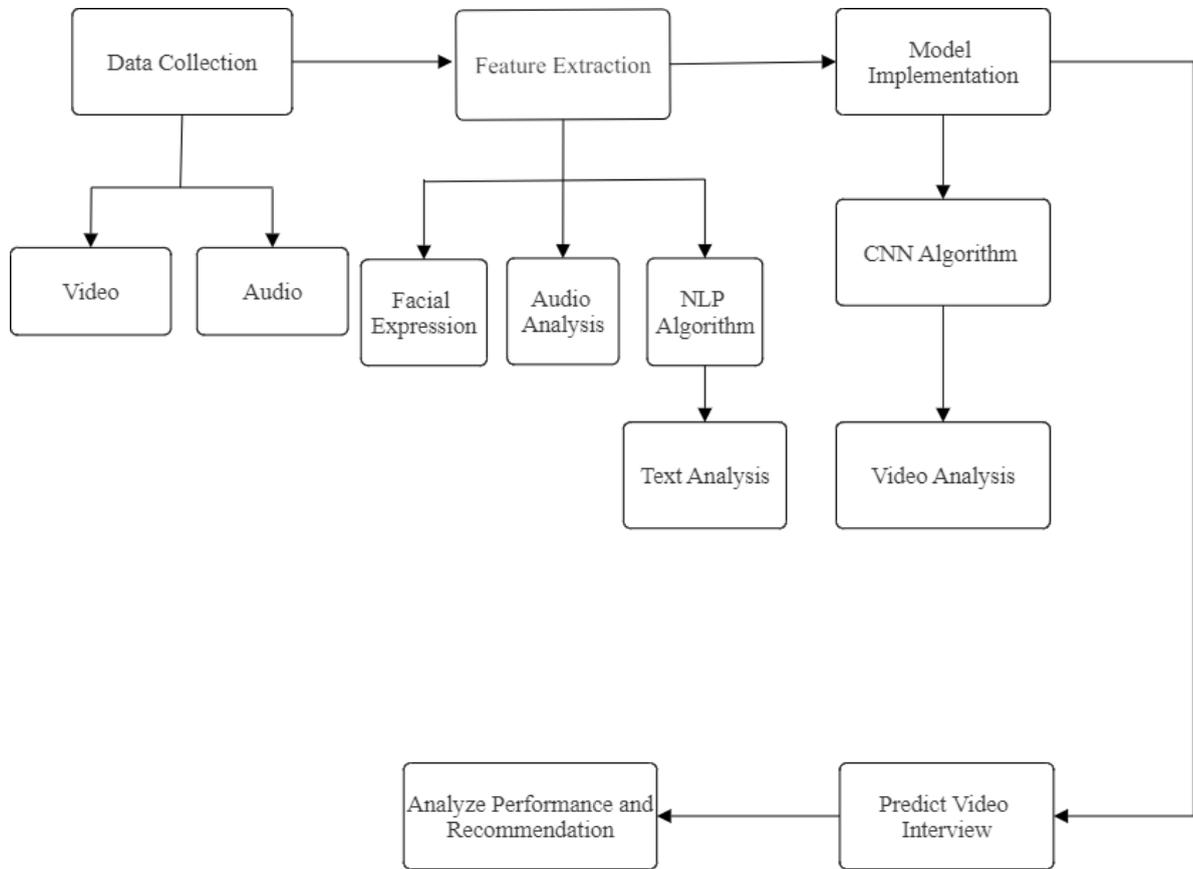


Fig:- System Architecture.

1. Data Collection:

- **Video:** This component captures video data during video interviews. It records candidate responses and facial expressions using the camera functionality.
- **Audio:** This component records audio data during both video and audio interviews. It captures verbal responses from candidates using the microphone.

2. Feature Extraction:

- **Facial Expression Analysis:** This part of feature extraction processes the video data to analyze facial expressions exhibited by candidates during video interviews. It extracts emotional cues such as happiness, surprise, or confusion.
- **Audio Analysis:** This component analyzes the audio data to extract relevant features such as tone, pitch, and speech patterns. It assesses the candidate's verbal communication skills and confidence levels.
- **NLP Algorithm:** The Natural Language Processing (NLP) algorithm processes the textual content of candidate responses. It performs text analysis to understand the semantic meaning, sentiment, and coherence of the responses.

3. Model Implementation:

- **CNN Algorithm:** The Convolutional Neural Network (CNN) algorithm is utilized for model implementation. It processes the extracted features from the video data for video analysis. The CNN algorithm is trained to recognize patterns and features in the video data, such as facial expressions and

body language.

4. Predict Video Interview:

- **Analyze Performance:** This component evaluates candidate performance based on the extracted features from the video data, audio data, and textual content. It combines the results of facial expression analysis, audio analysis, and NLP analysis to assess the candidate's overall performance during the interview.
- **Recommendation:** After analyzing the candidate's performance, this component generates recommendations for improvement. It provides constructive feedback to candidates based on their strengths and areas for development, helping them enhance their interview skills and communication abilities.

Explanation:

- **Data Collection:** The system collects data from candidates in the form of video and audio inputs. These inputs capture candidate responses and non-verbal cues during the interview process.
- **Feature Extraction:** The collected data undergoes feature extraction to extract relevant information for analysis. Facial Expression Analysis analyzes facial expressions, Audio Analysis assesses verbal communication, and the NLP Algorithm analyzes the textual content of responses.
- **Model Implementation:** The extracted features are processed using a CNN algorithm, which is trained to recognize patterns and features in the data. This model implementation enables the system to interpret and evaluate candidate performance effectively.
- **Predict Video Interview:** The system evaluates candidate performance based on the extracted features and provides recommendations for improvement. It combines the results of the analysis to generate constructive feedback, aiding candidates in enhancing their interview skills.

DFD (Level-0)

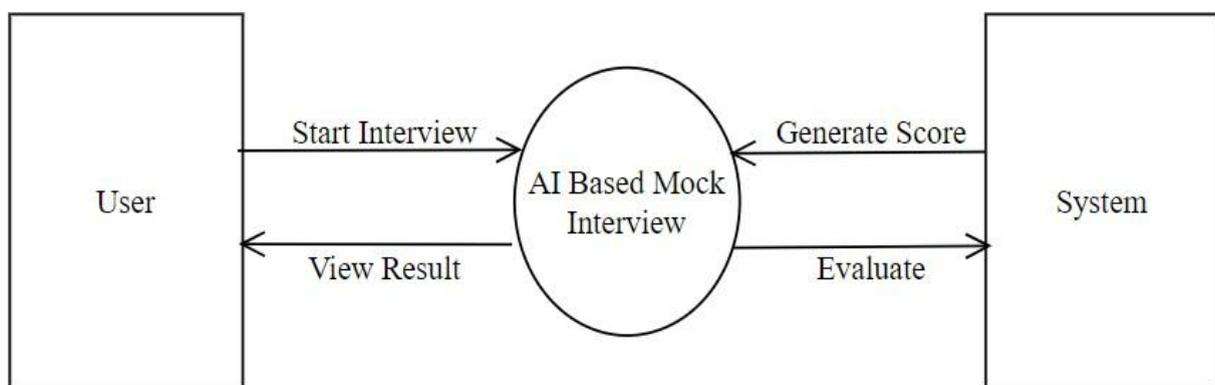


Fig DFD (Level-0)

Explanation:

1. **Process:** Evaluate
2. **External Entities**
 - User
 - System
 - Start Interview
 - View Result

3. The user initiates the process by starting the interview. The system then evaluates the interview and generates a score. The user can then view the result.

4. **Data flows:**

- The user starts the interview by providing some input to the system, such as their resume and the job they are interviewing for.
- The system then evaluates the interview, possibly by looking at factors such as the user's body language, their use of language, and their answers to the interview questions.
- The system generates a score based on its evaluation.
- The user can then view the score and see feedback from the system on their performance.

DFD (Level-1)

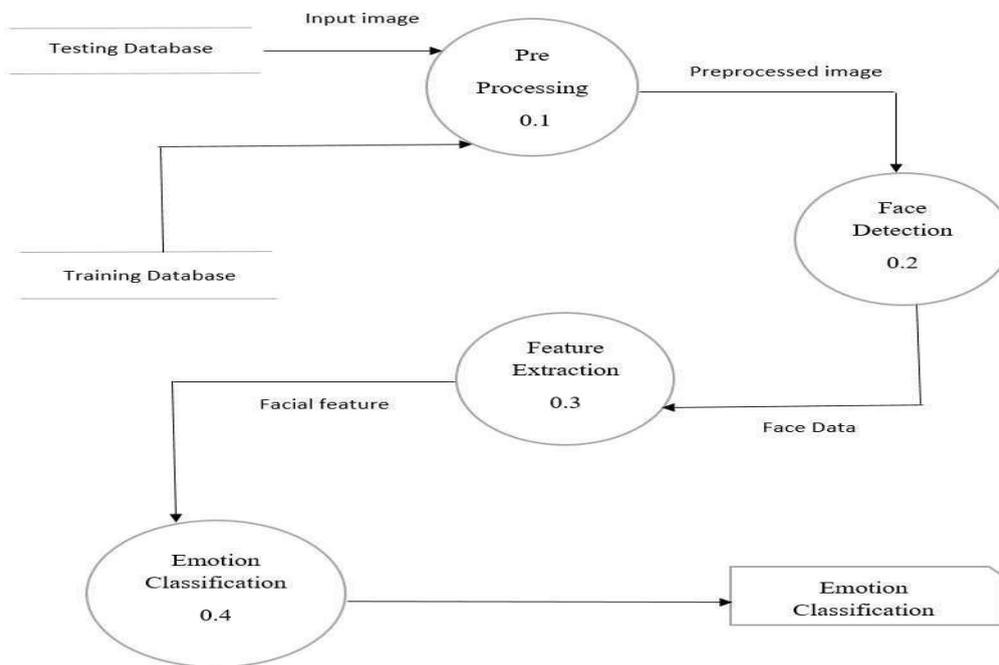


Fig DFD (Level-1)

Explanation:

1. **External Entities:**

- **User:** The user interacts with the system by providing their input, such as their image and responses to interview questions.
- **Training Database:** Stores information used to train the system's machine learning models, likely consisting of pre-recorded interviews and corresponding evaluations.
- **Testing Database:** Stores data used to evaluate the system's performance, possibly containing a collection of mock interviews and their human-rated scores.

2. **Processes:**

- **Input Image:** The system captures an image of the user's face, likely extracting facial features for analysis in the emotion classification process.
- **Preprocessing:** The system prepares the captured image for further processing. This might involve resizing the image, converting it to grayscale, or applying filters to remove noise.
- **Face Detection:** The system employs a computer vision model to identify the user's face within the image.
- **Feature Extraction:** The system extracts relevant features from the pre-processed image, possibly focusing on facial landmarks or expressions.
- **Emotion Classification:** The system utilizes a machine learning model to classify the user's emotions based on the extracted features. This might involve categorizing emotions like happiness, sadness, anger, or surprise.
- **Training:** The system is trained on data from the training database. This likely involves feeding the machine learning model with video recordings of mock interviews and their corresponding human-assigned emotional labels. The model learns to identify emotional patterns in facial expressions and associate them with the corresponding emotions.

5. Advantages of the Suggested System

1. **Real-Time Feedback** – Provides instant insights on verbal responses, facial expressions, and overall performance, helping candidates improve quickly.
2. **Objective Evaluation** – Eliminates human bias and ensures fair assessment based purely on data-driven analysis.
3. **Facial Expression & Emotion Analysis** – Tracks non-verbal cues to give a complete understanding of confidence, engagement, and communication skills.
4. **Convenient & Flexible** – Candidates can practice anytime, anywhere, without needing a human interviewer.
5. **Performance Tracking** – Shows progress over time with visual reports, allowing candidates to measure improvement.
6. **Personalized Recommendations** – Provides tailored feedback and suggestions to enhance communication, confidence, and body language.
7. **Automated & Time-Saving** – Reduces the need for manual interview evaluations, making the process efficient for both candidates and recruiters.
8. **Adaptable for Different Job Roles** – Generates industry-specific questions, making the mock interview relevant to various career fields.
9. **Confidence Building** – Helps candidates gain experience and overcome interview anxiety through repeated practice.
10. **Seamless User Experience** – Offers an intuitive and smooth interface for easy navigation and engagement.

6. Future Scope

1. **More Human-Like AI Interviews** – Future versions can use AI chatbots with voice and video to make interviews feel more natural and interactive.
2. **Advanced Emotion Analysis** – Improved facial expression and voice tone detection can provide even deeper insights into confidence and stress levels.
3. **Multilingual Support** – The system can support multiple languages, helping candidates prepare for global job opportunities.
4. **Industry-Specific Training** – AI can tailor interview questions and feedback for different industries, making the experience more relevant.
5. **Integration with Job Portals** – The system could connect with hiring platforms to give candidates real interview experience based on real job listings.
6. **Virtual Reality (VR) Interviews** – Future versions may use VR to create fully immersive mock interview experiences.

7. CONCLUSION

The AI-based mock interview evaluator is a powerful tool for improving interview skills. Using technologies like natural language processing and computer vision, it creates realistic mock interviews and provides personalized feedback.

While there are challenges like emotion recognition accuracy and data privacy concerns, the project offers a scalable, cost-effective, and fair way to help people prepare for interviews. To improve, it must refine its algorithms, enhance security, and combine AI with human guidance, like mentorship.

With continuous updates, this project can boost confidence, improve job readiness, and change how people prepare for interviews in the future.

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