Mock Interview System with Performance Analysis

The **Mock Interview System** is a personalized interview simulation platform that helps candidates assess their skills and performance in a virtual interview environment. In addition to evaluating the candidate's emotions, attention, and engagement, the system analyzes the candidate's answers using audio-to-text conversion. This feature scores the content of the answers based on relevance, clarity, and completeness. All data, including the questions, candidate responses, and detailed analysis, are saved for future review.

Features

1. **User Registration**:
    - Collect **name** and **email** for identification.
    - Upload the resume in PDF format.
2. **Resume Parsing and Question Generation**:
    - Extract key details from the resume (skills, work experience, education, etc.).
    - Generate personalized interview questions based on the parsed data.
3. **Interactive Interview Session**:
    - Display:
        - **Webcam preview** at the top of the UI.
        - **Questions** at the bottom of the UI.
    - Record:
        - **Video and audio** of the candidate during the session.
    - Real-time features:
        - **Facial expression analysis** to detect emotions (e.g., calm, nervous, happy).
        - **Attention tracking** to monitor eye gaze and focus.
        - **Audio-to-text conversion** of the candidate's responses.
4. **Answer Analysis**:
    - **Convert audio responses to text** using speech-to-text technology.
    - Analyze answers based on:
        - **Relevance**: Match with keywords and topics related to the question.
        - **Clarity**: Assess sentence structure, coherence, and fluency.
        - **Completeness**: Check if all aspects of the question are addressed.
    - Assign a score to each answer based on the above criteria.

5. **Performance Analysis**:
    - **Emotion Analysis**:
        - Classify emotions during each question (e.g., confidence, nervousness).
    - **Attention Tracking**:
        - Monitor whether the candidate stays focused on the screen.
    - **Answer Quality**:
        - Score responses for relevance, clarity, and completeness.
    - **Performance Scoring**:
        - Combine scores from facial expressions, attention tracking, and answer analysis.
6. **Data Management**:
    - Save all data in a folder named after the candidate's **name and timestamp**.
    - Include:
        - Video recording (.mp4).
        - Audio recording (.wav).
        - Emotion analysis results (.txt).
        - Attention tracking results (.txt).
        - Questions and transcribed answers (.txt).
        - Performance score (.txt).
7. **Final Feedback**:
    - Display the **performance score** and key insights:
        - Emotion stability and engagement.
        - Attention metrics.
        - Answer quality analysis.
    - Offer actionable suggestions for improvement (e.g., "Provide more structured responses," or "Include examples in your answers.").
    - Save a file with:
        - All questions asked.
        - Transcribed answers from the candidate.
        - Scores for each answer.

Workflow

1. Candidate Registration

- The user provides their **name** and **email address**.
- They upload their **resume** in PDF format.
- Move to the next window for resume confirmation.

2. Resume Confirmation

- The system displays extracted details from the resume:
    - Name, education, work experience, skills, projects, etc.
- The user confirms the accuracy of the extracted information.

3. Interview Setup

- The next window opens with:
    - **Webcam preview** on the top.
    - **Interview questions** displayed at the bottom.
- The system ensures:
    - **Real-time video and audio recording**.
    - **Facial expression analysis** for emotion tracking.
    - **Attention tracking** to monitor focus.

4. Interview Process

- The system asks personalized questions derived from the resume.
- During each question:
    - The **candidate's response is recorded** in audio format.
    - Real-time **facial expression analysis** tracks emotions.
    - **Attention tracking** monitors focus.
    - The system uses **speech-to-text conversion** to transcribe answers.
- All questions and transcribed answers are saved.

5. Answer Analysis

- After transcription, each answer is analyzed for:
    - **Relevance**: Matching the response with expected keywords or concepts.
    - **Clarity**: Evaluating coherence, grammar, and sentence fluency.
    - **Completeness**: Checking if all parts of the question are addressed.
- Scores are assigned to each response, which contribute to the final performance score.

6. Performance Analysis

- The system evaluates performance based on:
    - **Emotion Analysis**:
        - How consistent and positive the candidate's expressions were.
    - **Attention Metrics**:
        - Time spent focused on the screen versus distracted.
    - **Answer Quality**:
        - Aggregate score based on relevance, clarity, and completeness.

7. Results and Feedback

- The system provides a **comprehensive performance report**:
    - Final performance score (e.g., **85/100**).
    - Key metrics:
        - Emotion trends (e.g., "You maintained confidence throughout most of the interview but showed nervousness during technical questions.").
        - Attention tracking (e.g., "You stayed focused for 90% of the time.").
        - Answer scores (e.g., "Your answers were 80% relevant and 75% clear. Completeness scored 85%.").
    - Suggestions for improvement.
- All results are saved in a **candidate-specific folder**.

Data Storage Structure

For a candidate interviewed on January 21, 2025, at 3:30 PM, the folder structure will look like this:

Name_20250121_1530/

├── interview_recording.mp4 # Video recording of the session

├── interview_audio.wav # Audio recording of the session

├── emotion_analysis.txt # Timestamped emotion analysis data

├── attention_analysis.txt # Timestamped attention tracking data

├── questions_answers.txt # All questions and transcribed answers

├── answer_scores.txt # Scored analysis of answers

├── performance_score.txt # Final performance score and metrics

└── resume.pdf # Uploaded resume