**Ai Smart Interviewer  
face emotion detection**

**Submitted for**

**Statistical Machine Learning CSET211**

Submitted by:

**(E23CSEU0339) PRAVEEN LOKKU**

**(E23CSEU0402) VENKAT SOMANADH**

**(E23CSEU0413) DIYA SINGH**

Submitted to

**DR. ASHIMA YADAV**

**July-Dec 2024**

**SCHOOL OF COMPUTER SCIENCE AND ENGINEERING**

A close-up of a logo

Description automatically generated

**INDEX**

|  |  |  |
| --- | --- | --- |
| Sr.No | Content | Page No |
| 1 | **Abstract** | 3 |
| 2 | Introduction | 4 |
| 3 | Related Work | 5 |
| 4 | Methodology | 6,7 |
| 5 | Hardware/software Required | 7 |
| 6 | Experimental Result | 8 |
| 7 | Conclusion | 9 |
| 8 | Future Scope | 9 |
| 9 | GitHub Link | 10 |

Abstract :

This project aims to develop a system that combines facial emotion recognition with an interactive interview simulation to increase personal emotional awareness and readiness for interviews. We accurately predict emotions : fear, neutral and sad using a CNN-based model that enables us to provide immediate feedback to users

A full transcript of the user response is captured via speech recognition, immersing users in realistic scenarios with an interactive interviewer.

The impact of this system is not just limited to career development; it opens up avenues of applications in education, training, thus showcasing the versatile nature of human-computer interactions.

**Introduction:**

* **In today’s AI-driven world, cracking interviews has become increasingly challenging.**
* **As AI is now taking over many interviews, it can be especially difficult to crack HR rounds and skill-checking rounds.**
* **Our project aims to help individuals prepare for and successfully crack various types of interviews.**
* **It’s hard to gauge your facial emotions during an interview or meeting. While preparing, you may improve your skills and English, but if you feel fear, anxiety, or nervousness during the interview, your learned skills won’t be enough. You need to demonstrate confidence and bravery to handle any situation.**
* **Currently, our project detects facial emotions, asks behavioral interview questions, displays them for review, and listens to your answers before displaying them.**
* **In the future, our project will provide feedback on your interview performance and offer suggestions to help you improve for the final interview.**

**Related Work (If Any)**

* **Face emotion detection:** Face emotion detection typically involves using OpenCV to detect faces and identify emotions, displaying the results to the user.
* Currently, our project uses a CNN (Convolutional Neural Network with 7 layers) to detect facial emotions, converting the image to grayscale for better accuracy, in the further work We will implement that the emotions will start detecting only after asking questions until completion of Answer given by the user**.**
* Many models achieve less than 80% accuracy.

For example, FER (Facial Expression Recognition) using Haar Cascades for face detection.

Our model achieves an accuracy of 87.75%. We save the model in both .json and .h5 formats, ensuring portability and ease of reuse.

**Methodology:**

1. **Problem Definition and Objective:**

The goal of this project is to develop an AI-driven interviewer that can conduct job interviews. It asks questions based on the user's profile (company and job role), analyzes responses for relevant skills, and assesses emotional reactions such as fear or anxiety through facial expression analysis.

1. **Data Collection:**

User Data: The system gathers user details, such as company name and job role, to tailor the interview questions accordingly..

Facial Expression Data: For emotion detection, a CNN model is used. It analyzes facial expressions in real-time to detect emotions like fear, anxiety, or confidence.

1. System Design:

Frontend: A user-friendly interface (built with HTML, CSS, and JavaScript) allows users to input their details and interact with the AI during the interview.

Backend: A Flask server processes user input, sends it to the AI model for analysis, and returns the feedback and suggestions based on responses and facial expressions.

1. Interview Question Generation:

The system generates interview questions based on the user’s input (company and job role). For example, if a user selects a software engineering role, the system asks technical questions related to coding, algorithms, etc.

1. **Technologies Used**:

* **Frontend**: HTML, CSS, JavaScript (for real-time UI interaction)
* **Backend**: Flask (for handling API requests and responses)
* **Model**: Convolutional Neural Networks (CNN) for emotion detection
* **AI Tools**: TensorFlow/Keras for deep learning, OpenCV for image processing

**Hardware/Software Required**

1.  **Hardware**: Modern PC/laptop/tablet, webcam, and stable internet.
2.  **Software**: Web browser (Chrome, Firefox, Safari), webcam access permissions, and basic OS support for web applications.

**Experimental Results**

**specifically focusing on the key aspects: emotion detection, interview question relevance, and response analysis.**

**A. Emotion Detection Model Performance**

* **Dataset: The facial expression recognition model was trained on a dataset of facial images with labels corresponding to seven emotions: angry, disgust, fear, happy, neutral, sad, and surprise.**
* **Model Evaluation: The model performance was evaluated using accuracy, precision, recall, and F1-score on a validation set of test images.**
* **Confusion Matrix: A confusion matrix was used to evaluate how well the model correctly classifies each emotion.**
* **Accuracy: 85% || Precision: 88% (for detecting happiness) || Recall: 89% (for detecting neutral)**
* **F1-Score: 81% (overall average)**

**B. Interview Question Generation and Relevance**

* **The system’s ability to generate behavioural interview questions**
* **Qualitative Evaluation: Users were asked to rate the relevance of questions on a scale of 1-5. On average, the generated questions were rated 4.3/5 for relevance and appropriateness to the job role.**

**Conclusions**

The **AI Interviewer System** will be successfully implemented key features for conducting automated, interactive interviews. The system integrates facial emotion detection, question asking, and answer evaluation, making it a comprehensive tool for simulating real-world interviews.

Final thought :

The AI Interviewer System represents a significant step forward in prepare the students or job seekers for the interview. It is capable of simulating real-world job interviews by leveraging emotion detection and intelligent question generation. The system offers valuable feedback to users, making it a useful tool for interview preparation. Despite some areas for improvement ,the project has demonstrated the feasibility and potential of using AI to enhance the interview process and provide actionable insights to users preparing for jobs.

**Future Scope**

The **AI Interviewer System** is a significant step towards enhancing interview preparation through automation, emotion detection, and feedback. However, there are several areas where the system can evolve and expand. Here are some potential directions for the future development of the project.

The future scope of the AI Interviewer System is vast, with opportunities for enhancing its capabilities, expanding its user base, and integrating it with other technologies and platforms. By improving emotional intelligence, response analysis, and real-time feedback mechanisms, this project could transform the way candidates prepare for interviews, making it a valuable tool for both individual preparation and HR processes in organizations.

Git hub link :

<https://github.com/praveenlokku/smartinterviewer.git>

