

KRUTHAK SAMVAHAN: AN INTERACTIVE AI MODEL FOR RESPONSIVE AND EMPATHETIC COMMUNICATION

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Introduction:

- Job searching, especially for freshers, is often stressful and confidence-draining. Real interview experience is difficult to gain without facing actual interviews.
- This project aims to simulate real interview scenarios in a virtual environment.
- It uses Artificial Intelligence to generate and evaluate interview questions. Speech-to-text and text-to-speech technologies make the system interactive and accessible.
- Image processing is integrated to analyze facial expressions and ensure the candidate's presence. The system provides instant performance feedback to help candidates improve.
- It allows users to select their interview role and experience level to personalize the experience. All past interview interactions and feedback are available to the user for review.
- The goal is to help candidates boost confidence and become interview-ready through smart automation.

Objectives:

1. The model intelligently detects a range of human emotions by leveraging advanced speech analysis and facial recognition powered by image processing, creating a highly empathetic and responsive system.
2. It is designed for deployment in restricted human resource domains, facilitating meaningful interactions between various groups while maintaining security and adaptability to specific contexts.
3. The platform provides valuable assistance to deaf individuals by enabling them to communicate effectively through automated speech-to-text and text-to-speech capabilities, fostering inclusivity.

4. By engaging users in interactive conversations, the system aids in the holistic development of vocabulary, confidence, and subject knowledge, making it an ideal tool for personal growth and educational purposes.

Methodology:

- The NLP techniques facilitate recognizing the speech of the user by analysing and transcribing spoken words into text with high accuracy, enabling seamless communication between humans and machines.
- The web camera detects the user's face and processes the image in real-time using advanced computer vision techniques, such as facial landmark detection and feature extraction. Leveraging pre-trained models in facial emotion recognition, the system uses the processed data to provide feedback on the user's emotional state, enabling adaptive responses for enhanced interaction.
- The AI generates questions and responses to initiate and maintain a meaningful conversation with the user, using NLP techniques to ensure context-aware, engaging, and dynamic interactions.
- A feedback system is integrated into the model to analyze and process the user's replies, emotional expressions, and tone of confidence, enabling adaptive and personalized interactions for enhanced engagement and learning.

Result and Conclusion:

- The speech-to-text conversion was successfully implemented, with high accuracy and minimal latency, providing real-time text generation from spoken responses.
- The system includes mock interview scenarios with predefined questions, effectively simulating real-world job interviews.
- The user interface is clean, intuitive, and interactive, ensuring easy use for both technical and non-technical users. It displays converted text from spoken answers in real-time.
- The performance metrics show efficient real-time conversion with speech recognition accuracy aligning with industry standards.
- The system is a valuable tool for users with hearing impairments, allowing them to practice interviews by converting their spoken responses into text.
- It enhances job readiness by providing a supportive environment for users to practice and build confidence in mock interview scenarios.
- The project demonstrates how AI and image processing techniques can be leveraged to make mock interviews more accessible to a diverse user base.

Future Scope:

- Implement real-time, deep learning-based language translation to enable seamless cross-language interviews, allowing users from different linguistic backgrounds to participate in mock interviews without language barriers.
- Implement a deep reinforcement learning model to continuously improve the AI's ability to conduct interviews by learning from previous user interactions and adapting its interview techniques over time.
- Integrate the system with job platforms and recruitment sites, allowing users to directly apply their learned skills in mock interviews to real-world job opportunities.