



SpeechMood Analyser

Description

The SpeechMood Analyser is a real-time application that utilizes machine learning to detect and recognize human emotions from spoken text. The application uses a pre-trained deep learning model to classify sentences into various emotions, including Angry, Disgusted, Fearful, Happy, Neutral, Sad, and Surprised. This project demonstrates the integration of speech recognition and emotion analysis, which can have various applications, including user experience enhancement and mental health monitoring.

Why is it Important?

Understanding human emotions can be valuable in several domains, such as human-computer interaction, sentiment analysis, and mental health monitoring. The SpeechMood Analyser provides a simple and interactive way to showcase the capabilities of emotion detection models. It can be used as a starting point for building more advanced applications or for educational purposes in the fields of natural language processing and machine learning.

How to Use

To use the SpeechMood Analyser:

1. Ensure you have Python installed on your system.
2. Install the required libraries by running **`pip install -r requirements.txt`**.
3. Run the application using **`streamlit run app.py`**.
4. The application will open in your web browser, displaying options to start and finish the speech-to-emotion analysis. Emotions detected from the spoken text will be displayed alongside the recognized text.
5. Click the "Show Database" button to view the results in an Excel file.

Project Structure

The project is structured as follows:

- **app.py**: Main script to run the SpeechMood Analyser.
- **requirements.txt**: List of required Python libraries.

Functionality

1. **Speech Recognition**: The application uses the ``speech_recognition`` library to capture and convert spoken words into text.
2. **Emotion Detection Model**: The emotion detection model is a pre-trained transformer model loaded using the Hugging Face ``transformers`` library. The model predicts emotions from the recognized text.
3. **Streamlit Application**: The Streamlit application provides an interactive web interface for users to start and finish the emotion recognition process. It also includes a "Show Database" button to display the results.
4. **Real-time Emotion Recognition**: The main loop captures audio input, processes it, and uses the emotion detection model to predict the emotion of the spoken text. The detected emotion is displayed in real-time.
5. **Result Storage**: The application stores each recognized sentence and its corresponding emotion in an Excel file with columns for ID, Review, and Result.
6. **Exit and Resource Release**: The application can be exited by clicking the "Finish" button, which stops the process and shows the created Excel file.

Usage

1. Install Python on your system.
2. Install required libraries using **pip install -r requirements.txt**.
3. Run the application using **streamlit run app.py**.
4. Use the web interface to start the speech-to-emotion analysis.
5. Observe the recognized text and real-time emotion detection.
6. Click the "Show Database" button to view the results in an Excel file.
7. Click the "Finish" button to stop the process and exit the application.

Technologies Used

1. **speech_recognition (3.8.1)**: Used for converting spoken words into text.
2. **transformers (4.24.0)**: Deep learning framework for loading and using the pre-trained emotion detection model.
3. **streamlit (1.13.0)** : Web application framework for creating interactive and user-friendly interfaces.
4. **openpyxl (3.0.10)** : Library for creating and manipulating Excel files.

Conclusion

The SpeechMood Analyser serves as a practical example of integrating speech recognition and emotion analysis for real-world applications. It can be extended for various use cases, such as user experience enhancement, sentiment analysis, or mental health monitoring.