Healthcare Translation Web App

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1. Overview

The Healthcare Translation Web App is a browser-based application that translates spoken words from one language to another in real-time. The app ensures accurate translations and a smooth user experience by leveraging AI technologies.

2. Code Documentation

Code Structure

The application consists of the following components:

- **Backend**:
  - **Framework**: Python (Flask)
  - **Key Files**:
    - `app.py`: Handles route logic and API integrations.
  - **Endpoints**:
    - `/`: Serves the front-end of the application.
    - `/translate`: Processes translation requests.
    - `/transcribe`: Converts speech to text.
- **Frontend**:
  - **`main.js`**:
    - **Purpose**: Manages user interactions for translation and speech generation.
    - **Key Features**:
      - **`translateBtn` Listener**:
        - Captures input text and selected language.
        - Sends a translation request to `/translate`.
        - Displays the translated text.
      - **`speakBtn` Listener**:
        - Captures translated text and language.
        - Sends a speech synthesis request to `/speak`.
        - Plays the generated audio.
  - **`index.html`**:
    - **Purpose**: Provides the user interface.
    - **Key Elements**:
      - File upload for audio input.
      - Language selection dropdown.
      - Submit button for processing.
      - The results section shows the original transcript, translated text, and audio playback of the translated text.

AI Tools and Libraries

- **Speech-to-Text**:
  - Library: Assembly AI API
  - Converts audio input to text for further processing.
- **Text Translation**:
  - Library: Google Translate API
  - Translates text into the target language.
- **Other Libraries**:
  - Flask: Manages backend logic.
  - `os`: Handles file paths and directories.

Security Considerations

- **File System**:
  - Operates in a read-only file system, with temporary storage for development purposes.
- **API Keys**:
  - Sensitive keys are stored in environment variables to avoid exposure.
- **Input Validation**:
  - To prevent injection attacks, validate all user inputs (e.g., uploaded files, text).
- **HTTPS**:
  - Ensures secure API communication.

3. User Guide

Using the App

1. **Access the Application**:
   - Open the web app via the provided URL (Link).
2. **Upload an Audio File**:
   - Click the "Upload" button and select an audio file (`.mp3`, `.wav`).
3. **Translate**:
   - Choose a target language from the dropdown.
   - Click "Submit" to process the audio.
4. **View Results**:
   - See the original transcript and translation in the results section.
   - Play the synthesized audio using the playback controls.

Features Overview

- **Real-Time Speech Translation**:
  - Translates spoken words into the selected language efficiently.
- **User-Friendly Interface**:
  - Designed to accommodate users of all technical levels.
- **Language Support**:
  - Supports multiple languages, including English, Spanish, French and Chinese.

- **Secure and Fast**:
    - Ensures secure data handling with quick processing times.