# **English Accent Classifier with Video Analysis**

This Gradio application allows you to analyze English accents from audio extracted from video files. You can provide a video either via a direct URL or by uploading a file from your local machine.

## **How it Works (Step-by-Step Functionality)**

1. **Input Video:** You provide a video either by pasting a direct URL (MP4, Loom, Dropbox, Google Drive direct links) or by uploading a video file.
2. **Video Download/Upload:** The application securely downloads the video from the provided URL or processes your uploaded file.
3. **Audio Extraction:** The full audio track is extracted from the video for potential playback. A short segment (first 15 seconds) is also extracted for initial analysis.
4. **Language Detection:** The short audio segment is transcribed into text using an Automatic Speech Recognition (ASR) model. This text is then passed to a language detection model to confirm if the primary language is English.
5. **Accent Classification (if English):** If English is detected, a longer segment of audio (duration customizable by you) is extracted. This audio is then fed into a specialized accent classification model.
6. **Results Display:** The application presents the detected language status, the most likely English accent, and a detailed breakdown of confidence scores for various English accents in a clear table format. You can also play back the full extracted audio.

## **Features**

* **Accent Classification:** Predicts the English accent present in the audio.
* **Language Detection:** Verifies if the audio is in English before proceeding with accent classification.
* **Flexible Input:** Accepts video URLs or uploaded video files.
* **Adjustable Analysis Duration:** Control how many seconds of audio are used for accent analysis.
* **Audio Playback:** Includes a widget to play the full extracted audio file to the user.

## **How to Use**

1. **Provide Video Input:**
   * **Video URL (Recommended for online videos):** Paste a direct link to an MP4 video file, a Loom video share link, or a direct download link from platforms like Dropbox or Google Drive.
   * **Upload Video File:** Click "Drop File Here" or "Click to Upload" to select a video file from your computer.
2. **Set Analysis Duration:** Use the slider to select how many seconds of audio (from the beginning of the video) you want the accent classifier to analyze.
3. **Analyze Video:** Click the "Analyze Video" button to start the process.
4. **View Results:**
   * The "Language Detection Status" will show if English was successfully detected.
   * The "Extracted Audio (Full Duration)" player will allow you to listen to the full audio extracted from your video.
   * The "Predicted Accent" section will display the most likely accent and a detailed confidence table for all predicted accents.
5. **Clear Input:** Click the "Clear Input" button to reset the interface and prepare for a new analysis.

## **Input Conditions & Supported Formats**

The application is designed to handle specific types of video inputs to ensure successful processing.

### **Supported Video File Formats for Upload**

When uploading a file from your computer, the following video formats are supported:

* .mp4

### **Supported Video URL Formats**

When providing a URL, it must be a direct link to the video content, not a webpage that embeds the video. The is\_valid\_url function explicitly checks for these patterns:

1. **Direct MP4 File Links:** Any URL that ends with .mp4 will be accepted.
   * **Example:** https://www.learningcontainer.com/wp-content/uploads/2020/05/sample-mp4-file.mp4
   * **Example:** http://yourserver.com/path/to/your/video.mp4
2. **Loom Video Share Links:** Standard share links from Loom are supported.
   * **Example:** https://www.loom.com/share/abcdef1234567890
3. **Dropbox Direct Download Links:** For Dropbox, you need to obtain a **direct download link** for the MP4 file. This typically involves modifying the standard share link.
   * **How to get it:**
     1. Share your MP4 file on Dropbox and copy the shareable link.
     2. The link will usually end with dl=0. **Change dl=0 to dl=1**.
   * **Accepted Format Example:** https://www.dropbox.com/scl/fi/YOUR\_FILE\_ID/YOUR\_VIDEO\_NAME.mp4?rlkey=YOUR\_RLKEY&dl=1
   * **Important:** The URL must contain .mp4 in its path *before* any query parameters (? or &). Links to shared *folders* (which often contain /fo/ in their path) are **not** supported, even with dl=1.
4. **Google Drive Direct Download Links:** For Google Drive, you need a direct download or export link.
   * **How to get it:**
     1. Share your MP4 file on Google Drive and ensure sharing is set to "Anyone with the link".
     2. Copy the shareable link (e.g., https://drive.google.com/file/d/YOUR\_FILE\_ID/view?usp=sharing).
     3. **Modify the link** to the direct download format: https://drive.google.com/uc?id=YOUR\_FILE\_ID&export=download (replace YOUR\_FILE\_ID with the actual ID from your share link).
   * **Accepted Format Example:** https://drive.google.com/uc?id=1a2b3c4d5e6f7g8h9i0jklmnopqrstuvwxyz&export=download

**URLs that are NOT accepted:**

* Links to general webpages that *embed* videos (e.g., YouTube video pages, news articles with video players). The application does not recursively check webpages for video sources.
* Dropbox shared *folders* links.

## **FFmpeg Requirement**

This application relies on FFmpeg to extract audio from video files. FFmpeg is a powerful open-source multimedia framework.

**If you encounter errors related to video or audio processing (e.g., "Full audio extraction failed"), it's highly likely that FFmpeg is not installed or not correctly configured in your system's PATH.**

### **How to Install FFmpeg**

**For Windows:**

1. Go to the official FFmpeg website: <https://ffmpeg.org/download.html>
2. Click on the Windows icon and then choose a build (e.g., gyan.dev or BtbN).
3. Download the ffmpeg-N.N-full\_build.zip file (where N.N is the version number).
4. Unzip the file to a location like C:\ffmpeg.
5. **Add FFmpeg to your System PATH:**
   * Search for "Environment Variables" in the Windows search bar and select "Edit the system environment variables".
   * Click "Environment Variables..."
   * Under "System variables", find and select the Path variable, then click "Edit...".
   * Click "New" and add the path to the bin folder inside your FFmpeg directory (e.g., C:\ffmpeg\bin).
   * Click "OK" on all windows to save the changes.
   * **Restart your command prompt or IDE** for the changes to take effect.
6. **Verify Installation:** Open a new command prompt and type ffmpeg -version. If installed correctly, you'll see version information.

**For macOS:**

1. **Using Homebrew (Recommended):** If you don't have Homebrew, install it by running:  
   /bin/bash -c "$(curl -fsSL https://raw.githubusercontent.com/Homebrew/install/HEAD/install.sh)"
2. Install FFmpeg:  
   brew install ffmpeg
3. **Verify Installation:** Open a new terminal and type ffmpeg -version.

**For Linux (Ubuntu/Debian):**

sudo apt update  
sudo apt install ffmpeg

**Verify Installation:** ffmpeg -version

## **Troubleshooting**

* **"Invalid URL. Only .mp4 files or Loom videos are accepted."**:
  + Ensure the URL is a direct link to an MP4 file, a Loom video, or a correctly formatted Dropbox/Google Drive direct download link (as described in "Supported Video URL Formats" above).
  + Verify that the URL actually ends with .mp4 in its path for direct MP4 links.
  + For Dropbox, confirm dl=1 is at the end of the URL.
  + For Google Drive, ensure you're using the uc?id=...&export=download format.
* **"Error: Full audio extraction failed..." or similar video/audio processing errors:**
  + This almost always indicates an FFmpeg issue. Please follow the FFmpeg installation instructions carefully.
  + Ensure FFmpeg is added to your system's PATH.
  + Restart your terminal/IDE after installing FFmpeg.
* **"Error: The size of tensor a (XXX) must match the size of tensor b (YYY)..."**:
  + This error was addressed in the latest code update. Ensure you are running the most recent version of the Canvas. If it persists, the audio quality or format might be highly unusual, or there could be a subtle incompatibility with the specific audio.
* **"Could not transcribe audio for language detection."**:
  + The audio in the video might be too quiet, unclear, or contain very little speech in the first 15 seconds.
  + Try increasing the "Accent Analysis Duration" slider, as this also affects the length of the clip used for transcription.
* **"Detected language: [Non-English Language]. Please provide English audio..."**:
  + The language detection model determined that the primary language in the audio is not English. The accent classifier is specifically trained for English accents.