Candidate Number: EX0829

CM3065 Intelligent Signal Processing - Final Assignment

Exercise 3:

I have tried to construct the basic function of this application by using FFprobe and FFmpeg to meet the requirement. However, it is sad that I cannot fix all the bug within the code. The error always come out and said the file cannot be found. I have tried many ways to solve it but still in vain. The application still cannot work properly. But I would like to introduce what will this application be like if it can work correctly and what library I have used to achieve it.

Brief Description:

FFprobe and FFmpeg are multimedia frameworks used to decode, encode, transcode, and filter audio and video files. They can be downloaded from the official website. FFprobe is used to extract metadata from video files,

while FFmpeg can fix format-related issues. These are the two basic library I am using in this exercise.

Ideally, The provided Python script I wrote can analyze video files and generates a report on their format, codecs, resolution, aspect ratio, frame rate, and bit rates. It defines a Report class with properties representing various aspects of the video file, such as audio and video codec, bit rate, and quality. The class also has a method that returns True if all properties meet the expected requirements.

The check_file function takes a file path as a parameter and creates an instance of the Report class to store the analysis results. It uses FFprobe to extract metadata from the file, iterates through the audio and video streams, and checks their codecs, bit rates, and other attributes. If any of these properties do not meet the expected requirements, the corresponding property of the Report object is set to False and a message is added to the report string.

If the video file does not meet the expected format and quality requirements, the fix_file function is called to transcode the file using FFmpeg. The function adjusts the frame rate, resolution, and other attributes to the expected values, encodes the streams using the libx264 video codec and the audio codec, and sets the video and audio bit rates to 3 Mbps and 256 Kbps, respectively.

A video format, or container, is a file format that can contain different types of audio and video streams. Popular video formats include MP4, AVI, MOV, and MKV. A video codec is an algorithm used to compress and decompress digital video data. Popular video codecs include H.264, MPEG-4, and VP9. An audio codec is an algorithm used to compress and decompress digital audio data. Popular audio codecs include AAC, MP3, and Opus. The frame rate, expressed in frames per second (fps), is the number of frames displayed per second in a video, affecting the smoothness and resource usage.

Improvement:

Furthermore, I would like to solve the bug and hopefully it can work properly in the future. Besides, I would like to use other library work to enhance the function of this application. For example, I would create a progress bar in the interface of the application so that it can show the progression of reading or transferring the file, as the progress bar will keep moving to show its progress for giving user a better experience

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