프레임별 Step 분할 하기

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import cv2
import numpy as np
from moviepy.editor import VideoFileClip, concatenate_videoclips
import os

def detect_cut_points(video_path, threshold=4000000):
    cap = cv2.VideoCapture(video_path)
    frame_rate = cap.get(cv2.CAP_PROP_FPS)
    prev_frame = None
    frame_count = 0
    cut_points = []

    while(cap.isOpened()):
        ret, frame = cap.read()
        if not ret:
            break

        gray_frame = cv2.cvtColor(frame, cv2.COLOR_BGR2GRAY)
        if prev_frame is not None:
            frame_diff = cv2.absdiff(prev_frame, gray_frame)
            diff_sum = np.sum(frame_diff)

            if diff_sum > threshold:
                cut_points.append(frame_count)

        prev_frame = gray_frame
        frame_count += 1

    cap.release()
    return cut_points, frame_rate

def split_video(video_path, cut_points, frame_rate, output_dir='output',
overlap_seconds=2):
    if not os.path.exists(output_dir):
        os.makedirs(output_dir)

    video = VideoFileClip(video_path)
    cut_times = [frame / frame_rate for frame in cut_points]
    cut_times = [0] + cut_times + [video.duration]

    # 10초아래 클립 제거 및 합치기
    valid_cut_times = [cut_times[0]]
    for i in range(1, len(cut_times)):
        if cut_times[i] - valid_cut_times[-1] > 10:
            valid_cut_times.append(cut_times[i])
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    clips = []
    for i in range(len(valid_cut_times) - 1):
        start_time = valid_cut_times[i]
        end_time = valid_cut_times[i + 1]
        clip = video.subclip(start_time, end_time)
        clips.append(clip)

    final_clips = []
    for i in range(len(clips)):
        if i > 0:
            prev_clip = clips[i - 1].subclip(clips[i - 1].duration -
overlap_seconds, clips[i - 1].duration)
            current_clip = concatenate_videoclips([prev_clip, clips[i]])
            final_clips.append(current_clip)
        else:
            final_clips.append(clips[i])

    for i, clip in enumerate(final_clips):
        output_path = f"{output_dir}/part_{i + 1}.mp4"
        clip.write_videofile(output_path, codec="libx264")

def main(video_path, threshold, output_dir='output', overlap_seconds=2):
    cut_points, frame_rate = detect_cut_points(video_path, threshold)
    print("Detected cut points (frame numbers):", cut_points)
    split_video(video_path, cut_points, frame_rate, output_dir,
overlap_seconds)

# 설정값
video_path = 'ditto.mp4'
output_dir = 'output'

# 민감도 조절을 위한 threshold 값 (예: 2000000, 5000000, 10000000)
threshold = 4000000
overlap_seconds = 2  # 겹칠 시간 설정

main(video_path, threshold, output_dir, overlap_seconds)
```