**CSC 545/645 Computer Speech, Music and Images**

**Exercise No. 9, Week 12, Due April 11, 2021**

**Show frame to frame differences in videos**

**Goal**

Learn to use Processing’s video library

See how similar consecutive frames are in videos

**Procedure**

Write a Processing program to play a video and to show the frame to frame differences. Start with the skeleton code provided on Blackboard; there’s not much there because playing a video in Processing is so simple. You’ll have to install the video library from Sketch/Import Library, if you haven’t done that before.

First, get your program to play a video. Read movie frames in movieEvent()—an event handler that is called whenever a frame is available. You’ll use the Movie’s read() method; read() returns void so don’t assign it to anything. Draw the frame in the draw() function—use the Movie object as the image. Add code in keyReleased() to pause and restart the movie.

Once you have the video playing successfully, add the differencing code. You’ll write the diff function to difference the current frame from old\_img. You have already written code to difference images and this is pretty much the same—for each pixel, get the absolute value of the differences between the R, G, and B values, then make a new color and set the corresponding pixel in diff\_img to the new color. Unlike the image differences we have seen before, though, these differences can be large so I don’t think you want to shift or scale the differences (although you’re welcome to experiment). In draw(), use the boolean variable show\_diff to determine whether to display the current frame or diff\_img.

I have included the Hobbit trailer in the data folder. I removed the others because it was taking a long time for the exercise to upload to Blackboard. I didn’t mind waiting but I didn’t want to force you to wait on the download. So I’ve added links below where you can download the other movie trailers. I also had a couple of sports clips but it’s gotten a bit tricky to download from YouTube so I didn’t include them in the links. But I left the file names in the Ex09 code; you can search for them if you want to. As you watch the frame differences (when you complete the exercise), think about how motion compensation could minimize the differences even further.

I suspect you could create some interesting effects by adding older frames to the current frame, using the alpha channel to let the older frames fade out but I haven’t tried it.

**Processing Movie methods you will use**

play() //plays a movie

pause() // pauses a movie

read() //reads a new frame

stop() // stops a movie playing

**Deliverables**

Submit your pde file on Blackboard before the due date.

**Locations of movie trailers**

shazam-trailer-2\_h480p.mov: <http://www.hd-trailers.net/movie/shazam/>

beauty-and-the-beast-trailer-2\_h480p.mov: <http://www.hd-trailers.net/movie/beauty-and-the-beast/>

dumbo-trailer-2\_h480p.mov: <http://www.hd-trailers.net/movie/dumbo/>

shazam-trailer-2\_h480p.mov: <http://www.hd-trailers.net/movie/shazam/>