FIT5221 – Assignment – Dr. Abhinav Dhall
Submission due – 21st July 2020 11.55PM Suzhou.

Instructions->

1. All code should be in Python 3.7.x and use *Skimage* imaging library only. OpenCV or PIL cannot be used.
2. There should one common *Report.doc* for all the tasks below.
3. Submit a single zip file containing the task python files, report and images.
4. Late submission penalty – 1 mark per day.
5. Submission is to be made only on Moodle.
6. Plagiarism cases will be dealt following Monash policy.

Task1: Write your own Canny edge detector – 10 marks

Name the python file as *MyCannyEdgeDetectorDemo.py*
In the python file define a function *myCannyEdgeDetector(image, Low_Threshold, High_Threshold)*

You cannot use the inbuilt canny edge detection function of skimage inside the myCannyEdgeDetector(image, Low_Threshold, High_Threshold) function

Marking –

a. In the word document *Report.doc* discuss about how did you decide the Low and high thresholds for hysteresis. – 1 marks
b. On running *MyCannyEdgeDetectorDemo.py*, it should generate the following items for an input image – (i) output of skimage.feature.canny for the input image; (ii) edge output of *myCannyEdgeDetector();* (iii) Compute the peak signal to noise ratio (PSNR) between the outputs of skimage's canny edge detector and the *myCannyEdgeDetector().* Display the PSNR value too. Correct output – 3 marks
c. Complete MyCannyEdgeDetectorDemo.py (containing *myCannyEdgeDetector()*) - 6 marks

Task 2: Create a video collage – 10 marks

Take a video's frames as input and create a collage of frames of that video.

Chose five frames from the video *randomly* and join them into a collage. Sort the frames based on their color/edge information. An example for image placement in collage: image with less variation in color can be in the centre and the ones on the boundary of the collage have more color variation.

Marking –

a. *CollageCreate(AddressofFolder)* function in *CollageCreator.py* returns and displays a collage image. The input to the function is a relative address of folder containing images from a video. Marks – 8 marks
b. In the word document *Report.doc* mention the method in *CollageCreate()*. How are the images joined together – 2 marks

Hint: histograms, color and edge information can be used. For extracting frames from a video, you can use *ffmpeg* library.

More assignment instructions →
During the assignment marking the files *MyCannyEdgeDetectorDemo.py* and *CollageCreator.py* will be executed directly and the outputs will be checked.

No change is going to be made to the code at our end. The image folder (for both the tasks above) should be part of the zip file, which you will upload on Moodle. In the image folder do not store more than 10 images. Make sure that the resolution of each image is <= 640x480.

Make sure that you check that the code works, when the zip file is unzipped.