Computer Vision

Assignment 5

Background Subtraction

Date Assigned: Tuesday 29-11-22 **Due Date: Tuesday 06-12-22**

Guidelines:

- Submit all of your code, saved images and results in a single zip file with the name **FirstName_RollNumber_05.zip**
- Submit a single zip file containing:
    - Code (FirstName_RollNumber.ipynb)
    - Code (FirstName_RollNumber.py)
    - Video folder
    - Report (FirstName_RollNumber.pdf)

- Email the TA or put it in the classroom if there are any questions.
- Start early to complete it before time.
- You can discuss with each other but cannot look at or use anyone's code or implementation. Also you are not allowed to copy code from the Internet. Not following the naming convention will result in marks deduction.
- There will be strict checking regarding plagiarism and those who will be found guilty of plagiarism be assigned 0 with additional grade penalty. Therefore it is better to get less marks than 0.
- You cannot use any built-in function unless specifically mentioned at the end.

Note: 20% deduction for each late day.

Overview:

In this assignment you will learn about background subtraction from the video.

Dateset:

As an example data, a video is given that you need to use for this assignment. i.e. road.mp4.

Task 1: [Marks]

- You need to remove the background from the video such that there should only be the foreground objects remaining in the video.
- To remove the background you first need to pick a few initial frames that only have the background with no object. In the attached road video you can take the frames of the first 2 seconds when there is no car in the video.
- During training you need to learn a background model, for every background pixel you need to make three gaussian distributions.
- During testing you need to match the test frame pixels with the learned models of corresponding pixels.
- If there is a match then it means that the pixel is background otherwise it is foreground.In the output video make all BG pixels as block, (0,0,0). If there is no match, retain that pixel as it is.You have to submit the output videos as well.
- Save the results video with the .mp4 extension. Your resultant video should be of the same size as the original video.
- Along with the given video you need to implement your code on 2 more videos of your choice. Those videos should be greater than 5 seconds duration.
- Save all the three videos in the video folder.