School of Computing
National University of Singapore
CS4243 Computer Vision and Pattern Recognition
Semester 1, AY 2016/17

Lab 5: Background/Foreground Separation
Due Date: Labs in the week 3rd Oct – 7th Oct 2016

Objectives:

- To experiment with the averaging technique that we learned in class and use it to do background/foreground separation for videos taken using stationary cameras (please refer to lecture notes CS4243_L04_Color_v8.pdf slide #33).
    - Note that by "background", we mean the pixels that belong to the stationary part of the scene.

Preparation:

- Download the zip file lab5.zip into your working directory. Unzip the file and you should find the following: `traffic.mp4.`

Part 1. Initialisation

- Create a python script file called bg.py. Follow the rest of this lab instruction sheet to develop the script for extracting the background.

- Set the working directory, e.g., `d:/myname`, and import relevant modules.

```
import os
os.chdir("d:/myname")
import cv2
import cv2.cv as cv
import numpy as np
```

Part 2. Background Extraction in Video

Write a program to do background extraction in video using the following hints:

- Step 1: read the .mp4 video using OpenCV Python API cv2.VideoCapture
- Step 2: print the frame width, frame height, frames per second and frame count of the input video using cap.get
- Step 3: convert frame width, frame height, frames per second and frame count into integers using int()

- Step 4: get the background object by averaging away the foreground (i.e. moving) objects using the following suggested codes:

```
_,img = cap.read()
avgImg = np.float32(img)
for fr in range(1,frameCount):


  ---- fill up your codes here -----
  ---- hint:  you may use cv2.accumulateWeighted,  cv2.convertScaleAbs




  cv2.imshow('img',img)
  cv2.imshow('normImg', normImg)   # normImg is avgImg converted into uint8
  print "fr = ", fr, " alpha = ", alpha
cv2.waitKey(0)
cv2.destroyAllWindows()
cap.release()
```

Capture a snapshot of the background and save this background image.

Submission Instruction

Please show the video output (i.e. background) to the TA at the end of the lab session.

Submit the softcopy of your Python code and the background image to IVLE at the end of the lab session.

Please put all your files in a folder and submit the folder. Use the following convention to name your folder:

StudentNumber_yourName_Lab#. For example, if your student number is A1234567B, and your name is Chow Yuen Fatt, for this lab, your file name should be A1234567B_ChowYuenFatt_Lab5.