Intelligent Interactive Systems (1MD032) 2016-2017

Assignment 1 – instructions and important dates

The objective of Assignment 1 is to assess that you can effectively apply techniques for detection and tracking of features describing human behaviour.
To pass Assignment 1, you are required to create a small program **("basic" task, mandatory)** using OpenCV that does the following:

- Reads a video in input (a video capturing your face; note that this should be an offline video previously recorded)
- Detects eyes and mouth using the Viola-Jones algorithm for face detection
- Tracks eyes and mouth over time using the Camshift algorithm
- Shows the tracked eyes and mouth using a rectangle or an ellipse drawn around them in the video

Note that the program needs to do all of the above at the same time.

While you capture your video, try to move your head in different directions and see what happens when you put a hand in front of your face.

This task of Assignment 1 will be conducted in the lab. You will be asked to register and to attend one of the two following lab slots:

Wednesday 12/04/2017 (13:15-15:00, room 1515): lab assignment 1 (slot 1; first group)
Thursday 13/04/2017 (08:15-10:00, room 1515): lab assignment 1 (slot 2; second group)

You can work on your code at home and bring it with you the day of the lab assignment, where you will be requested to run it on one of the lab's computers.

"Advanced" task (optional): in addition to the task above (mandatory to pass), you have the option to conduct and advanced task (optional). Successful completion of the advanced task will result in a bonus towards the final grade of the course.

To pass the advanced task of Assignment 1, you are required to create a program using Python and OpenCV that extracts PHOG (Pyramid Histogram of Oriented Gradients) features. You will be provided with a code development kit. This code base has the basic framework, utility code and testing code implemented along with the training/testing data sets. Your implementation will be tested by giving it as an input to a set of classifiers. The end result will be displayed as a Pass/Fail report in test file. You **need not** implement the classifier nor the testing framework in this assignment. You are expected to do the steps mentioned below, following the instructions document provided for the advanced task (see "extratask.pdf"):

- Read and understand the document that covers the theory required to complete this task

- Complete the code in three modules/functions from their respective algorithms following the instructions provided in the document
- These three modules deal with computing gradients, generating a histogram, generating PHOG features from the histogram
- Upon completing the implementation run the testPHOG.py file provided in the code-base, which generates the PHOG_Eval.txt and PHOG_report.txt files as an output.
- Keep working on your implementation of the functions so that all the tests are a Pass as reported in PHOG_Eval.txt

You are required to upload the code on the Student Portal **by Thursday 13/04/2017 at 16:00**.

On the Student Portal, you should create a folder named "YourName-YourSurname-advanced-task" under "Assignment 1" in the "Assignments" section on the Student Portal.