Second Assignment
Computer Game AI
COMP09041

Issue Date: Friday, April 1st, 2016
Due Date: **5pm, Friday, April 29th, 2016**

Face Recognition

The simplified version of the OpenCV "Eigenfaces" face recognition program was introduced in week 8's lab session (and included here as facerec.cpp). Using the AT&T Face Database, the program removes a randomly selected image of a face from the 400 in the database; and then attempts to match that image with those remaining of the same class; i.e. of the same person.

Add your own face to the database by adding ten 92×112 8-bit pgm images, named 1.pgm, 2.pgm etc., to a new subdirectory of **att_faces** named, say, **s41**. Then, update the code to operate in a continuous mode, and output a *single* message should your face be recognised by the camera. You may optionally display the video from the camera during execution.

After completing your coding, please also answer these two follow-up questions:

a. The `FaceRecognizer::predict` method returns a label indicating a match has been found. Is it possible to obtain a measure of the system's *confidence* in that match?

b. Does the program compensate if you are far from the camera? Might a cascading classifier help?

Suggested Approach

After having updated the database, you will want to add a loop to the code of `facerec.cpp`, to check for the appearance of your face. Note that your call to the `FaceRecognizer::train` method will occur *before* this loop. Note too that you may need to come closer to the camera to obtain a match. Feel free to consult the video input handling code from week 7, as seen in 2_capture_show_video.cpp.

Resources

You have at your disposal from week 8's Moodle site:

- The AT&T Face Database: att_faces.zip
- OpenCV's extra modules: opencv_contrib-3.1.0.tar.gz

As before, ensure that you have both of these unpacked in the same directory as the facerec.cpp source file, before you use CMake. facerec.cpp will initially expect to find the contents of att_faces.zip stored within a directory named **att_faces**.

Please get in touch if you would like to borrow a camera.

Submission

Your submission should include your source code, along with a .txt file containing your answers to the two questions above. You may optionally include the ten images of your face; or a screenshot of Windows Explorer such as that provided in faces.jpg. You should work individually.

Marking Scheme

The assignment is worth 20% of the marks awarded for the entire COMP09041 module. The following provides a breakdown of the marking scheme for this assignment:

Meeting the program specification	10%
Quality of the code submitted	6%
Answer to Question a.	2%
Answer to Question b.	2%