Computer Vision

James L. Crowley and Nachwa Aboubakr

MoSIG M2   Fall Semester
Project 1:   1 October 2020

Display Faces from the FDDB data set.

The objective for this exercise is to use Python and OpenCV to display images of faces from the FDDB data set with Open CV. Your code should be entered as a Jupyter Notebook.   Test data and ground truth are provided by the "FDDB: Face Detection Data Set and Benchmark Home" of the University of Massachusetts. The data set can be found at http://vis-www.cs.umass.edu/fddb/ and is described in the paper (Jain and Learned-Miller 2010) available on the course web site. http://crowley-coutaz.fr/jlc/Courses/2020/GVR.VO/GVR-VO.html

The FDDB data set contains 2845 images with a total of 5171 faces extracted from news articles selected using an automatic face detector. Faces with a height or width less than 20 pixels, as well as faces that are looking away from the camera were rejected. The remaining 5171 faces have been noted in a ground-truth data set and labeled with a bounding box. The images in this data set exhibit large variations in pose, lighting, background and appearance due to factors such as motion, occlusions, and facial expressions, which are characteristic of the unconstrained setting for image acquisition.   Each face is also described with an ellipse parameterized by center location, the lengths of its major and minor axes, and its orientation, as shown in the following images:
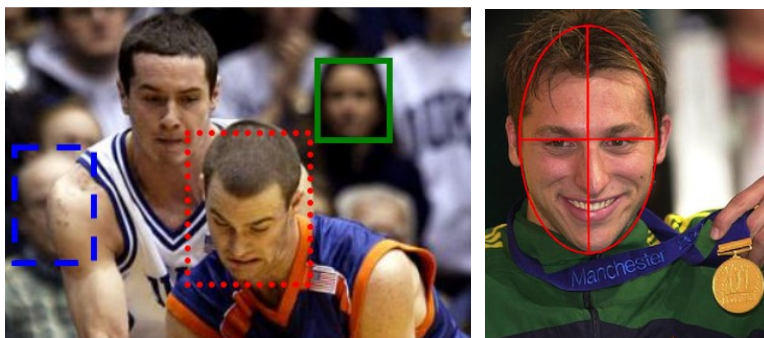
Face Boxes   Face Ellipses

To do this exercise you must install miniConda Python on your computer, create and activate a python workspace, install opencv, matplotlib and jupyter notebooks from the python forge. You should then, do the following in a jupyter notebook:
1) Import cv2 (opencv) and numpy and jupyter notebooks.
2) Download and extract the FDDB dataset and face annotations from the FDDB website.
3) Locate and display an image in FDDB with opencv.
4) Parse the face annotation file to get the ellipse annotation per face in an image. You can find the structure of this file explained in README.txt file on FDDB website.
5) Plot the ground truth bounding box/ellipse for each faces in an image using opencv
6) Document your work in the Jupyter Notebook by commenting it and send the resulted .ipynb file to: James.Crowley@inria.fr, Nachwa.Aboubakr@inria.fr, Yangtao.Wang@inria.fr

[Jain and Learned-Miller 2010]   V. Jain and E. Learned-Miller, "FDDB: A Benchmark for Face Detection in Unconstrained Settings", UMass Amherst Technical Report (2010).