Pattern Recognition and Machine Learning

James L. Crowley

ENSIMAG 3 - MMIS Fall Semester
Lab Project 2: 9 November 2016

The Viola Jones Face Detector

In 2001, Paul Viola and Mike Jones at MERL (Misubishi Research Labs) demonstrated a revolutionary new technique to detect faces in images using (1) a sliding window approach, (2) Haar like features and (3) a cascade of committee classifiers learned with Adaboost. The resulting face detection system was published in the OpenCV toolkit and is now widely used in practical applications. (See http://docs.opencv.org/trunk/d7/d8b/tutorial_py_face_detection.html)

The objective of this project is to evaluate the effectiveness the Viola Jones face detector using the "FDDB: Face Detection Data Set and Benchmark Home" of the University of Massachusetts. The FDDB 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 for download from the course web site. You can also test the procedure with other annotated data sets of face images found on the internet.

Each programming team should
1) Detect faces using different scale factors using subsets of the FDDB data set.
2) Plot error rates for the detector when applied with different scale factors.
3) Interpret the results, describing the effectiveness of the detectors and explaining the sources of errors.

Lab work will be reported with a written report in either French or English. Work will be evaluated based on the effectiveness of the experimental evaluations, and the clarity and depth of the explanation of experimental results.

[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).