Object Detection Project

Part I: Wink Detection

Write an OpenCV program that can detect a winking face. The input to the program is a folder containing images. The program displays each image, and marks each winking face with a distinct color.

Evaluation

Run the program on test data and count:
A. Total number of detected winking faces.
B. Total number of non-winking faces detected as winking faces.

The goal is to try to obtain a detector that maximizes A and minimizes B.

Data

The program is evaluated on data that was obtained from google using the keyword "wink". Most of the test data is in the subfolder called "wink". In the evaluation we use all the images in that folder.

Part II - Finger Detection

Create a cascade detector for fingers, or fingertips, using OpenCV. Positive training samples should be taken from the images in the "fingers" subfolder. (The images in that folder will also be used for evaluating the program.)

Constraints on training data

The training data should satisfy the following constraints:
1. At most 3 fingers/fingertips can be used as positive training images. They must be obtained (clipped) from the provided images in the "fingers" folder.
2. At most 5 images can be used as negative samples. How to select them is up to you. (They do not have to come from the "fingers" folder.)

They key elements of this method are:
1. The file cascade.xml that defines the trained detector.
2. The positive samples and the negative samples that were used to train the detector.
3. The parameters of createsamples.exe and traincascade.exe that were used to generate the detector.

Evaluation

Run the finger detector on all the images in the "fingers" subfolder and count:
A. Total number of fingers/fingertips detected.
B. Total number of non-fingers detected as fingers.
The goal is to try to obtain a detector that maximizes A and minimizes B.