

Team Smiley

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Progress Report 2 – 11/20

Project Topic: Real-time emotion recognition

Progress:

Using OpenCV and haarcascade we were able to implement tracking of the eyes and mouth in addition to the face. You can find our eyes and mouth tracking in our `face_tracking.py` file. Tracking the eyes were relatively simple, but the mouth haarcascade file turned up a lot of false positives (see figure 1) after choosing the “best” mouth based on the criteria that a mouth should be at least a certain distance below the bottom of the eyes, but still above the bottom of the face, we were able to achieve much more accurate results (see figure 2). We have yet to track eyebrows. We also are currently tracking the bounds of these facial features and not point clusters as is stated in our objective, we believe this will be the next step to using optical flow to detect emotion.

After researching SVM and optical flow we have decided to use optical flow based on research in the paper “Recognizing Human Facial Expression” by Yaser Yacoob and Larry S. Davis to recognize emotion. The code we have started for optical flow is located in `optical_flow.py`. It currently shows the movement of a point in a video. We are still in the process of debugging the optical flow code on mac machines, it currently only works on a windows machine. Our goal is to use this method to track the movement of key facial features such as the eyes and mouth to determine emotion (i.e. an upward moving mouth corner could likely indicate a smile and therefore happiness).

We are about a day behind schedule due to difficulties we were having detecting the mouth and debugging the optical flow code.

Objectives:

- 1) Use computer’s webcam to implement real-time face tracking.

Result: Detect human faces when they appear in the webcam’s frame.

- 2) Detect eyes, eyebrows, and mouth from a face in a live video

Result: Track the eyes, eyebrows, and mouth as separate nodes (collection of points) on a single face in live video.

- 3) Recognize basic emotions from a face in a live video

Result: Recognize happiness, sadness, and neutrality from a single face in a live video.

Figure 1

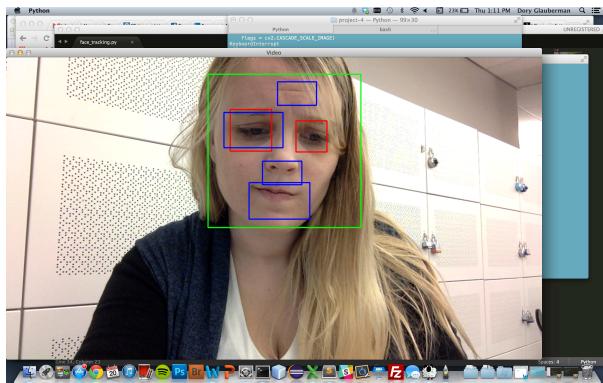
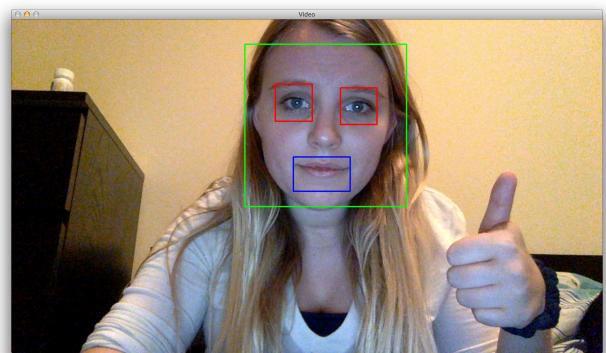


Figure 2



Schedule:

11/21 - 11/23:

Objective 2: Detect eyes, eyebrows, and mouth from a face in a live video
Detect key points within the eyes, eyebrows, and mouth to use for optical flow calculations
Effort: Hard

11/24 - 12/2:

Objective 3: Recognize basic emotions from a face in a live video
Detect happiness, sadness, and neutrality from a single face in a live video.
Report emotions in real-time as they change.
Effort: Hard