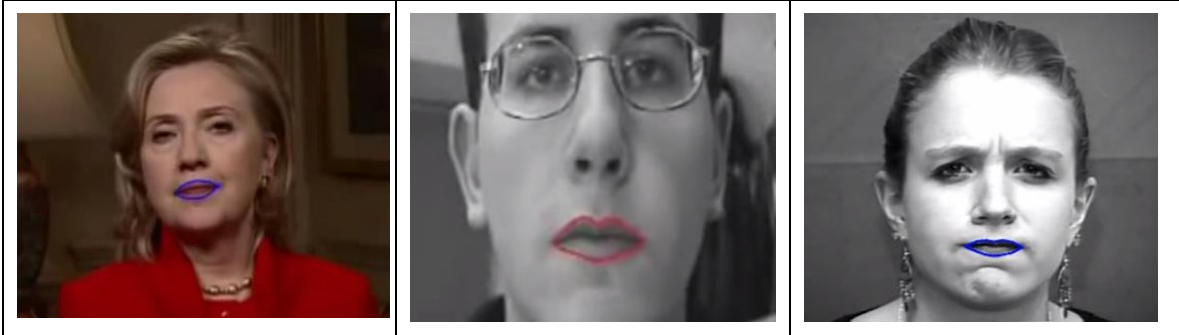# Homework Assignment #2

DUE: 5:00pm, Sunday April 10th (Electronic turnin required)

You are to implement a lip tracking program using the Snake. Please take a look at the following Youtube videos to see what your program should do:

https://www.youtube.com/watch?v=j7jr7sh5fmQ, and
https://www.youtube.com/watch?v=772p4mTlVs4

Sample test images can be found in http://www.cs.ucsb.edu/~cs281b/testimages/prog2/ (or follow the local image archive link from the class web page). Make sure that your programs work on images in that directory.

Your program must

(1) Create a lip template (Matlab ginput function should help here) based on some sample image(s) of the test videos. Note that you should submit your flexible template with your program for grading, as the reader will not re-create the template for you. Hence, your template should be able to properly initialize itself and track lip motion in all test video sequences in the local archive. You are allowed to use different templates for different sequences if needed.

(2) Be able to track the mouth motion with the following deformation and change

        a. Talking
        b. Laughing, fawning and other common expressions
        c. Slight camera zoom in or out
        d. Slight rotation and translation of the head
        e. Slight change in the environmental illumination

Your Matlab program should accept four arguments: (directory, root, idx1, idx2). "directory" is the data directory, "root" is the root image filename, idx1 is the starting index, and idx2 is the end index. Or the images in the video are named root_idx1.jpg to root_idx2.jpg, increment by 1. All indices will be 5 digits long, padded by 0 if necessary (e.g., 00001, 00010, 00100, 01000, etc.) You should output, for each input frame, the corresponding output frame with the lip tracking result highlighted in color.

BONUS: If you implement additional functionalities, e.g., a more detailed template, other facial templates (e.g., eye), ability to tolerate large and sudden scale, lighting and pose changes, etc., you should turn in your program with your own video sequences (if necessary) to demonstrate the advanced capabilities. Please provide a README file so the reader knows what to look for.