Blake Lazarine ECE 180 DA Week 1 Report

1. What you planned to do this week

While I wasn't entirely sure what to expect from this week, I did suspect that we would be forming teams and

2. What you ended up doing?

Github Repo: https://github.com/BlakeLazarine/180DA-WarmUp

This week, I started by formalizing a team for this class. Over summer, I learned that several people in Bruin Supermileage with me are also taking this class, and we decided to form a group ahead of time. Upon starting class, we formalized this and were able to get to work rather quickly.

I am already familiar with Github, so creating the required repository was easy. I had not yet installed Anaconda on my computer, so installing that and the required libraries took some time. I found the virtual environment setup to be an interesting process, I had never used something like that before so I found it quite illuminating. I had assumed you needed to use something like Docker to make dependencies portable and project-specific, but this appears very useful.

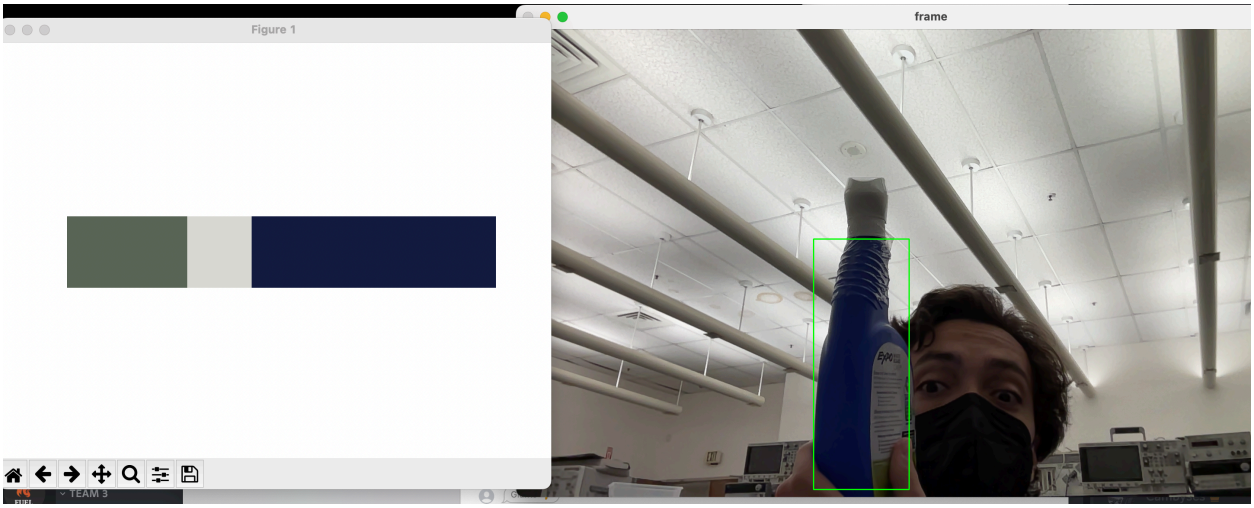
I have used the cv2 library only a little after taking the ECE 188 course on Computer Vision, so I understood what was happening, but did take a moment to gather my bearings. At first I had an issue where there were many many small boxes rather than 1 large box. To solve this, I sorted the contours by area and put a box around only the largest one.

Tasks 1-3 were done and the files can be found in the Github Repo

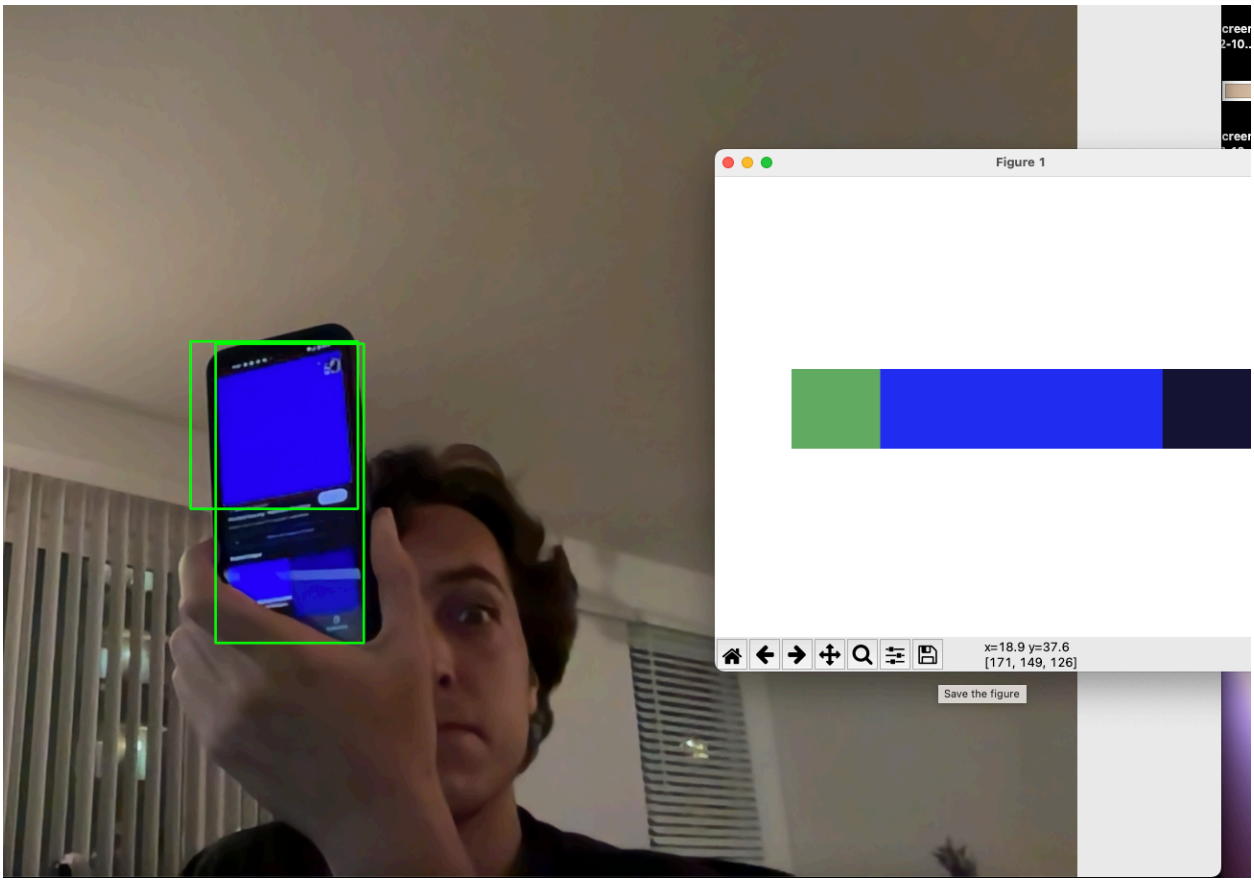
Task 4:
1 - I tracked a bright-blue whiteboard eraser fluid bottle, for which the built-in HSV thresholding worked very well. I believe HSV works better than RGB for the purpose of tracking blue objects, because HSV allows for the hue to be condensed into a single value, so the thresholding can depend primarily on that one value.

2 - Darker environments made it a little more difficult to differentiate between colors, but not impossible.

3 - For me, my phone was always able to be detected, regardless of brightness.



4 - Using the K-means algorithm on the entire frame significantly slowed my computer's ability to operate quickly, so I am glad it was reduced in size. At first, I had the k-means box be that of the bounding box around the tracked object, but changed this after reading the spec more closely. This smaller box seemed to be accurately presenting the dominant colors, regardless of source.



I used these pages as sources and cited them in the comments of my code

https://www.geeksforgeeks.org/how-to-update-a-plot-in-matplotlib/
https://code.likeagirl.io/finding-dominant-colour-on-an-image-b4e075f98097
https://docs.opencv.org/4.x/df/d9d/tutorial_py_colorspaces.html
https://docs.opencv.org/4.x/dd/d49/tutorial_py_contour_features.html

3. What you plan to do next week

Next week I plan on discussing project ideas with my team and getting further into the groove of setting everything up.