

Lab 1 Report

Last week plan (N/A because week 0)

Accomplished last week

Tutorial

- Refreshed my memory on how to use Git and introduced to OpenCV
- Difficult understanding some of the return values of the functions used in the tutorials and addressed this by reading other articles and forums

Project

- Brainstormed topics we were interested in tackling and pinpointed a tentative topic (wellness reminders for individuals)
- Ideated relevant features that fit constraints and address problem space

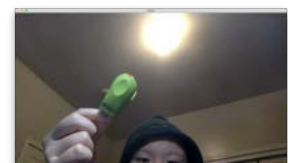
Plan next week

- Determine which features are relevant to the goal we're seeking to accomplish and fill out the project proposal draft
- Figure out necessary hardware in order to determine what must be ordered and who should work on which portion of the project

Responses

Task 4 - #1

- HSV is better than RGB for object detection because HSV separates image intensity from color information. This is useful when lighting conditions are constantly changing.
- The threshold range used to track the object is $H \pm 30$. The value of H was determined using the code



snippet "How to find HSV values to track?" in the OpenCV documentation.

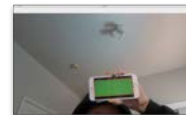
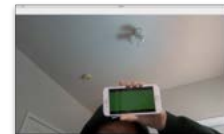
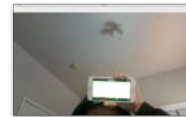
Task 4 - #2

- Turning off the lights decreases the accuracy of the object detection, where just a portion of the stapler has a bounding box around it.
- With the lights off, it is likely that the shadows are darker than the threshold that is established.



Task 4 - #3

- For the color picker, I chose RGB = (0, 255, 0) / HSL = (120, 100%, 50%). I used a smaller threshold of $H \pm 10$ because external lighting conditions don't affect the detection of the color on the phone screen.
- Turning brightness all the way up or all the way down hurts the code's ability to track the object because the screen looks white or the screen shows only the reflection of objects, respectively.



Task 4 - #4

- The phone is more robust to changing lighting conditions compared to the non-phone object. This is likely due to the fact that the phone is consistently lit and this is maintained regardless of external lighting.

