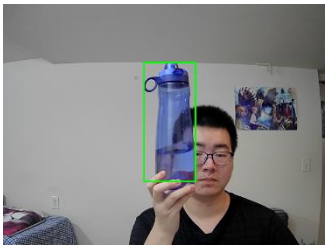
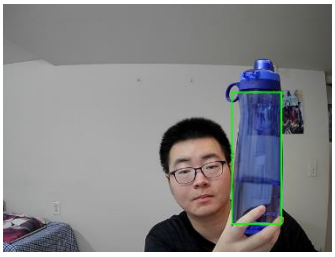
Lab1 Task4

1 for HSV

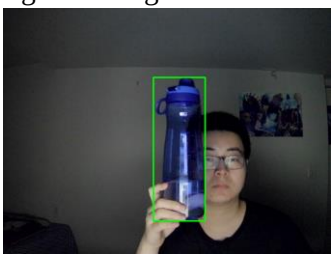
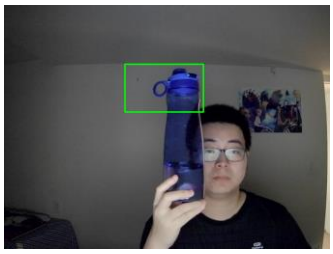


For RGB,



From the results, we can see that HSV is better than RGB at detecting blue elements as RGB did not include the top of the water bottle.
The threshold range for HSV: (100,50,50) for lower bound of blue and (130, 255, 255) for upper bound of blue; for RGB: (100,0,0) for lower bound of blue and (255,100,100).

2
Turning off the light

Hsv:  RGB: 

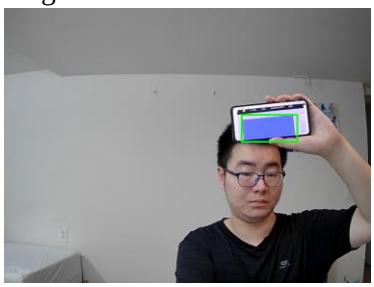
With flash light

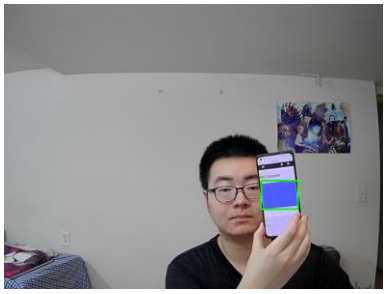
Hsv:  RGB: 

From the results, we can see that by changing the light condition, the tracking ability of HSV does not vary much but that of RGB becomes significantly poorer.

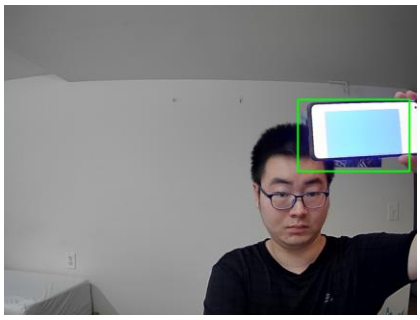
3

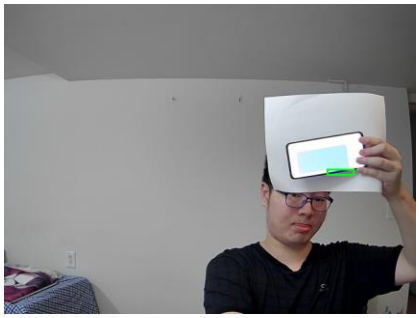
With low phone brightness:

HSV: 

RGB: 

With high phone brightness:

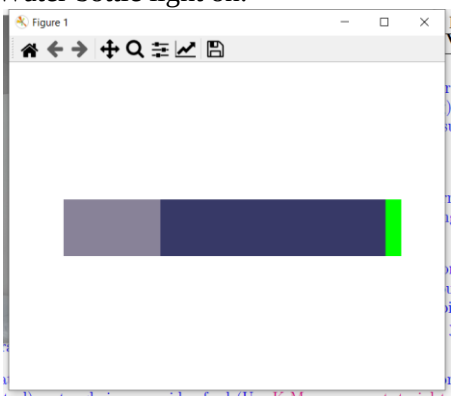
HSV: 

RGB: 

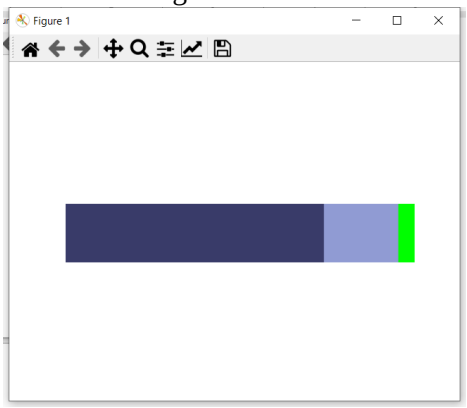
We can see both methods are affected by phone brightness. With low phone brightness, both methods detect blue colors relatively accurately. With high phone brightness, both methods detect blue colors poorly, with RGB much worse off.

4

Water bottle light on:

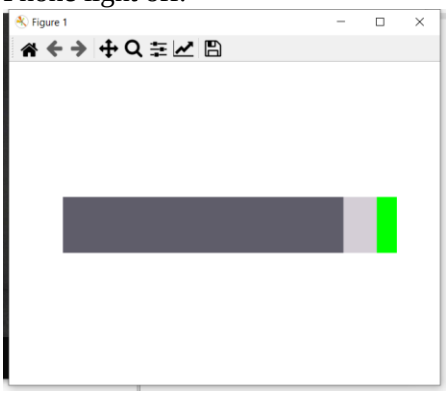


Water bottle light off:



Phone light on:

Phone light off:



Water bottle is more robust to changes than phone.