Lab Report I

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Part of my code was copied from links provided in the lab session:

https://docs.opencv.org/3.0-beta/doc/py_tutorials/py_gui/py_video_display/py_video_display.html

https://docs.opencv.org/4.x/d7/d4d/tutorial_py_thresholding.html

https://docs.opencv.org/4.x/df/d9d/tutorial_py_colorspaces.html

https://code.likeagirl.io/finding-dominant-colour-on-an-image-b4e075f98097

Task 1,2,3 can be found on my GitHub website: https://github.com/HarveySYu/180DA-WarmUp

Task 4: part 1:

please see attached videos named output_boxed_HSV.avi and output_boxed_RGB.avi.

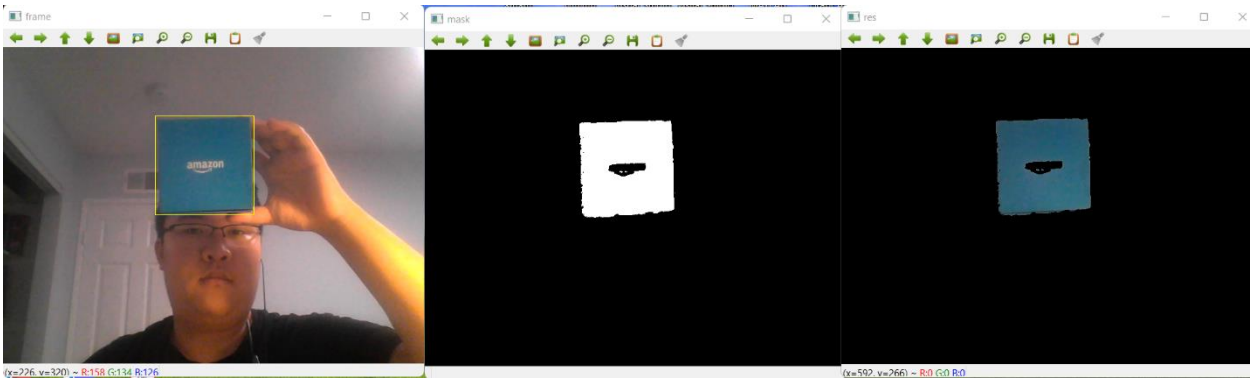
In the object I choose is a blue box, and in the HSV video it is surrounded by a yellow box, and in the HSV video it is surrounded by a red box. To my point of view, HSV and RGB system don't have much difference. HSV express colors in a spherical system while RGB do it in the cubic system. However, RGB tell a color more intuitively by combining Red, Green and Blue. HSV let you choose a basic color in a circle (what H does), then choose the saturation (what S does), then choose a darkness value (what V does). To my point of view, RGB system is better at calling for one or few colors, because the formation of the color is straight-forward, while HSV system is better at representing a range of colors.

The range I choose in RGB system is [0,25,50] to [0,127,255].

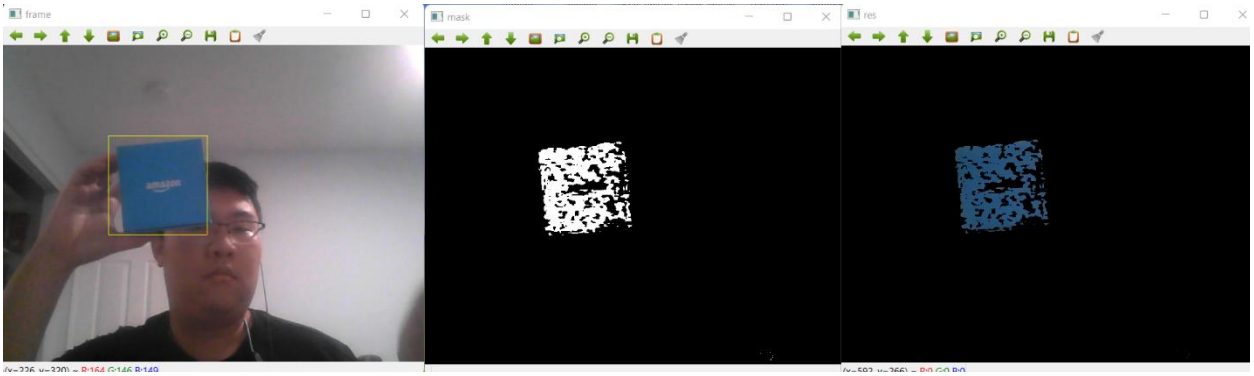
The range I choose in HSV system is [75,50,50] to[105,255,255].

Part 2:

The tracking ability is lowered when the lighting of the room gets dimmer. Screenshots below clearly shows this. As we can see, when the room gets dimmer, there are more patches in the mask figure, showing that the tacking ability is decreased.



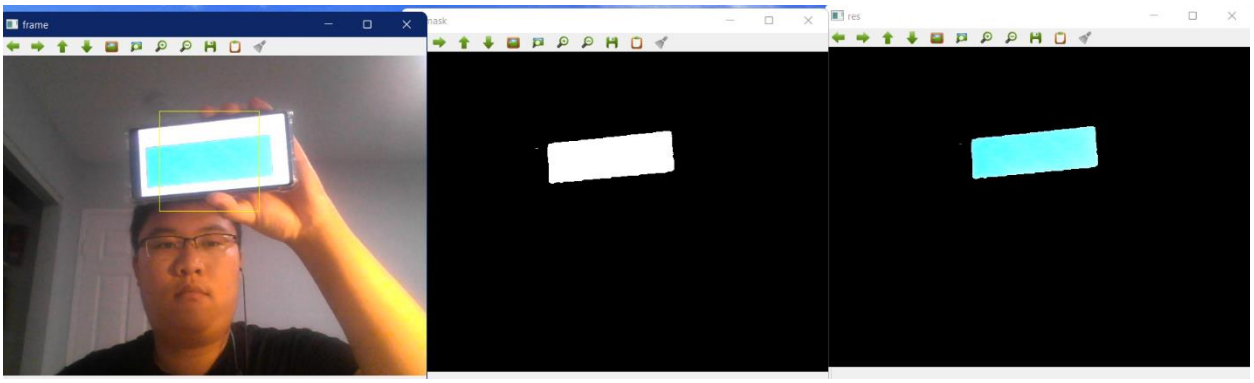
Brighter



Dimmer

Part 3:

The range of the color is [75,50,50] to[105,255,255]. And the color I used on the phone is [90,200,200]. Screenshots below clearly shows that when the phone is brighter, the camera can clearly sense the color. However, when the phone's screen gets dimer, the image becomes blurrier



Brighter Phone

Dimmer Phone

Part 4:

From screenshots below we can tell that the brightness of the object will not affect the dominant color of the box too much, however, the brightness of the cellphone will affect the dominant color of the box. I guess this is because cellphone is a light source, so camera is more sensitive to it.

Brighter object

Dimmer object

Brighter Phone

Dimmer Phone