

This course mainly learns to make the car correctly recognize the corresponding color by modifying the default HSV value according to the current experimental environment.

Path:

/home/pi/Yahboom_project/Raspbot/3.AI Vision course/02.Color recognition/Color recognition+button.ipynb

1. Running the program to the place as shown below.

```
mask = cv2.erode(mask, None, iterations=2)
mask = cv2.dilate(mask, None, iterations=2)
mask = cv2.GaussianBlur(mask, (3,3),0)
cnts = cv2.findContours(mask.copy(), cv2.RETR_EXTERNAL, cv2.CHAIN_APPROX_SIMPLE)[-2]
if 1: # Push button switch
    if len(cnts) > 0:
        cnt = max(cnts, key = cv2.contourArea)
        (color_x, color_y), color_radius = cv2.minEnclosingCircle(cnt)
        if color_radius > 10:
            # Mark the detected color with the original shape coil
            cv2.circle(frame, (int(color_x), int(color_y)), int(color_radius), (255,0,255), 2)
            # Proportion-Integration-Differentiation

image_widget.value = bgr8_to_jpeg(frame)
image_widget1.value = bgr8_to_jpeg(mask)
# print(g_mode)
```

[10]: thread1 = threading.Thread(target=TEST)
thread1.setDaemon(True)
thread1.start()

[]: stop_thread(thread1)

Then, we can adjust the slider to change the HSV value to ensure that the current color can be correctly identified (for example, red).

```
[6]: Hmin = widgets.FloatSlider(description='Hmin', min=0, max=180, step=1, orientation='Vertical')
Hmax = widgets.FloatSlider(description='Hmax', min=0, max=179, step=1, orientation='Vertical')
Smin = widgets.FloatSlider(description='Smin', min=0, max=255, step=1, orientation='Vertical')
Smax = widgets.FloatSlider(description='Smax', min=0, max=255, step=1, orientation='Vertical')
Vmin = widgets.FloatSlider(description='Vmin', min=0, max=255, step=1, orientation='Vertical')
Vmax = widgets.FloatSlider(description='Vmax', min=0, max=255, step=1, orientation='Vertical')
# create a horizontal box container to place the sliders next to eachother
slider_container = widgets.HBox([Hmin, Hmax, Smin, Smax, Vmin, Vmax])
# display the container in this cell's output
display(slider_container)
import numpy as np
```



```
[7]: color_hsv = {"red" : ((0, 70, 72), (7, 255, 255)),
"green" : ((54, 109, 78), (77, 255, 255)),
"blue" : ((92, 100, 62), (121, 251, 255)),
"yellow": ((26, 100, 91), (32, 255, 255))}
```

As shown below, it can recognize the red accurately.



Running the program to the place as shown below to ending this process.

```

image_widget.value = bgr8_to_jpeg(frame)
image_widget1.value = bgr8_to_jpeg(mask)
# print(g_mode)

[10]: thread1 = threading.Thread(target=TEST)
      thread1.setDaemon(True)
      thread1.start()

[11]: stop_thread(thread1)

```

Part II

Create an array to store red HSV color area data

2. Running the program to the place as shown below.

```

image_widget.value = bgr8_to_jpeg(frame)
image_widget1.value = bgr8_to_jpeg(mask)
# print(g_mode)

Start

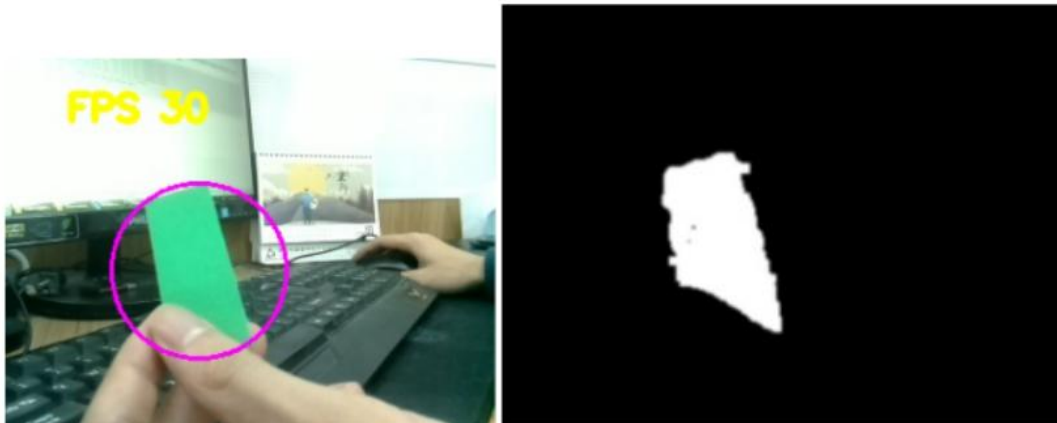
16]: thread1 = threading.Thread(target=Color_Recongnize)
      thread1.setDaemon(True)
      thread1.start()

```

Choose color button.



Then, you will see that green objects will be recognized. As shown below.



Path:

/home/pi/Yahboom_project/Raspbot/3.AI Vision course/02.Color recognition/Color detection.ipynb

This is program can recognize multiple color objects at the same time.

