3. HSV value test

1. Experimental purpose

Drive the car to calibrate HSV value and identify color

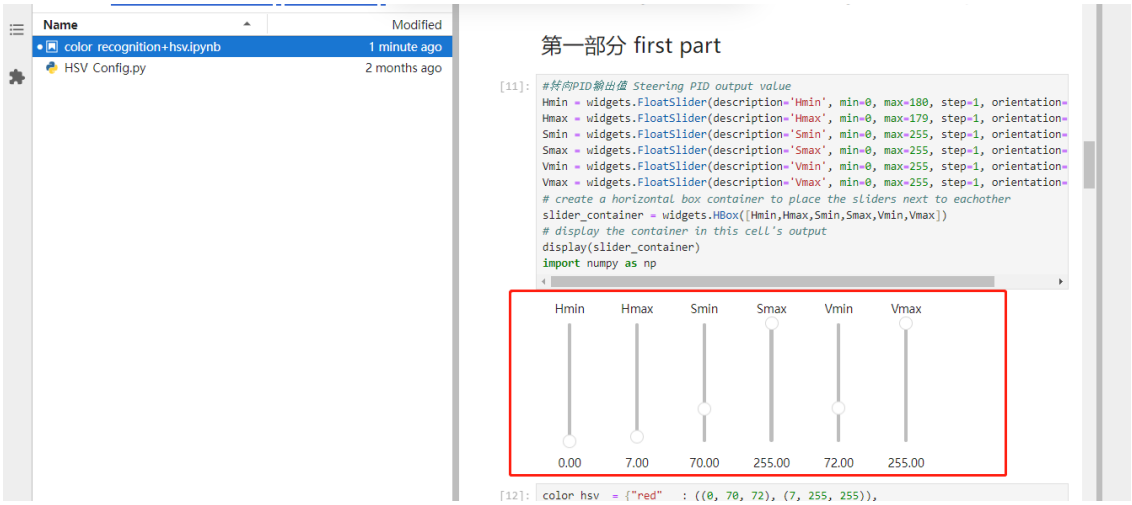
2. Experimental path source code

Enter the car system, end the car program, enter "ip (ip is the car's ip): 8888" in the browser, enter the password "yahboom"

Then log in
Enter the path of **Rider-pi_class/5.AI Visual Recognition Course/3. HSV value test** and run **color_recognition+hsv.ipynb**.

3. Experimental phenomenon

1. Determine the HSV value of the color by calling the HSV slider. If you don't want to adjust it, you can skip this step and use the HSV value that has been adjusted in the tutorial



2. Overwrite the adjusted value with the value in the program. If you haven't adjusted it, you can skip it directly.

```
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))}
```

3. Then run it down, the car will select the color to be recognized according to the adjusted HSV value and perform the corresponding color recognition

4. Analysis of main source code parameters

```
def Color_Recongnize():
    global color_lower, color_upper, g_mode
    t_start = time.time()
    fps = 0
    while True:
        ret, frame = image.read()#USB摄像头 USB Camera
        # frame = picam2.capture_array() #CSI摄像头 CSI Camera
        #frame = cv2.resize(frame, (400, 400))
        frame_ = cv2.GaussianBlur(frame,(5,5),0)
        hsv = cv2.cvtColor(frame,cv2.COLOR_BGR2HSV)
        mask = cv2.inRange(hsv,color_lower,color_upper)
        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 g_mode == 1: # 按钮切换开关 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:
                # 将检测到的颜色用原形线圈标记出来 Mark the detected color with a
prototype circle
                    cv2.circle(frame,
(int(color_x),int(color_y)),int(color_radius),(255,0,255),2)
```

```
                    # Proportion-Integration-Differentiation
        fps = fps + 1
        mfps = fps / (time.time() - t_start)
        cv2.putText(frame, "FPS " + str(int(mfps)), (40,40),
cv2.FONT_HERSHEY_SIMPLEX, 0.8, (0,255,255), 3)
        # 实时传回图像数据进行显示 Real-time image data transmission for display
        image_widget.value = bgr8_to_jpeg(frame)
        image_widget1.value = bgr8_to_jpeg(mask)

        #显示在小车的lcd屏幕上
        b,g,r = cv2.split(frame)
        img = cv2.merge((r,g,b))
        imgok = Image.fromarray(img)
        mydisplay.ShowImage(imgok)
        # print(g_mode)
```

Color_Recongnize: is a function thread for color recognition. By recognizing the target color, the result is displayed on the screen of the car and the screen of the computer.