QR code recognition action

1. Experimental purpose

Drive the car to recognize the QR code and perform corresponding actions according to the information in the QR code.

2. Experimental path source code

Enter the car system and end the car program
Then enter the terminal

```
/home/pi/Rider-pi_class/6.AI Visual Interaction Course/3. QR code recognition/
python3 qrcode_sport.py
```

3. Experimental phenomenon

After running the source code, you can see that the car can recognize the information of the QR code and display the result of the QR code. The car will also perform corresponding actions according to the QR code

[4]:
```
# 导入组件 Importing Components
import ipywidgets.widgets as widgets
image_widget = widgets.Image(format='jpeg', width=320, height=240)  #设置

# 将BGR图像转换为JPEG格式的字节流 Convert a BGR image to a JPEG byte stream
def bgr8_to_jpeg(value, quality=75):
    return bytes(cv2.imencode('.jpg', value)[1])

display(image_widget) #显示出来
```

QR codes that can be recognized in this tutorial

4. Main source code analysis

```
import pyzbar.pyzbar as pyzbar

def cv2AddChineseText(img, text, position, textColor=(0, 255, 0), textSize=30):
    if (isinstance(img, np.ndarray)):
        img = Image.fromarray(cv2.cvtColor(img, cv2.COLOR_BGR2RGB))
    draw = ImageDraw.Draw(img)
    fontStyle = ImageFont.truetype(
        "/home/pi/model/msyh.ttc", textSize, encoding="utf-8")
    draw.text(position, text, textColor, font=fontStyle)
    return cv2.cvtColor(np.asarray(img), cv2.COLOR_RGB2BGR)


font = cv2.FONT_HERSHEY_SIMPLEX
cap=cv2.VideoCapture(0)
cap.set(3,320)
cap.set(4,240)
if(not cap.isOpened()):
    print("[camera.py:cam]:can't open this camera")

while(True):
    barcodeData = ""
    ret, img = cap.read()
    img_ROI_gray = cv2.cvtColor(img, cv2.COLOR_BGR2GRAY)
    barcodes = pyzbar.decode(img_ROI_gray)
```

```
    for barcode in barcodes:
        barcodeData = barcode.data.decode("utf-8")
        barcodeType = barcode.type
        text = "{} ({})".format(barcodeData, barcodeType)
        img=cv2AddChineseText(img,text, (10, 30),(0, 255, 0), 30)
        print("[INFO] Found {} barcode: {}".format(barcodeType, barcodeData))


    b,g,r = cv2.split(img)
    img = cv2.merge((r,g,b))
    imgok = Image.fromarray(img)
    display.ShowImage(imgok)

    r,g,b = cv2.split(img)
    img1 = cv2.merge((b,g,r))
    cv2.imshow("image1",img1)


    if(barcodeData == "goahead"):
        g_car.rider_move_x(0.5,0.2) #前进0.2s
    elif(barcodeData == "goback"):
        g_car.rider_move_x(-0.5,0.2) #后退0.2s

    elif(barcodeData == "turnright"):
        g_car.rider_turn(-200,0.2) #右转0.2s
    elif(barcodeData == "turnleft"):
        g_car.rider_turn(200,0.2) #左转0.2s

    elif(barcodeData == "updown"):
        g_car.rider_periodic_z(2)
        time.sleep(2.5)#蹲起2.5s
        g_car.rider_periodic_z(0)

    elif(barcodeData == "shake"):
        g_car.rider_periodic_roll(2) #左右晃动2.5s
        time.sleep(2.5)
        g_car.rider_periodic_roll(0)

### If you want to add more QR code recognition information
### You can add it here, using the elif statement.
    ### 如果想要添加更多的二维码识别信息
    ### 可以添加在这，使用elif语句即可。


    if (cv2.waitKey(1)) == ord('q'):
        break
    if button.press_b():
        break

cap.release()
```

Through the source code, we can see that the car uses the camera to identify, displays the identified QR code results on the car's screen and the computer's screen, and lets the car run the actions corresponding to the code.