

## Lesson 4 Shape Recognition

### 1. Getting Ready

Prepare a dot matrix module and install it on the expansion hole of robot's left arm. The specific installation method can refer to the file "Sensor Installing and Wiring" under the same directory.



### 2. Working Principle

Let's look at the working principle.

The camera recognizes the object within the visual range. When the shapes of the objects are identified as triangle, rectangles and circles, the dot matrix module will display the graphics shape of the current object, otherwise the dot matrix module does not display.

The source code of the program is located in  
`/home/pi/TonyPi/Extend/ShapeRecognition.py`

```

60 while True:
61     if shape_length == 3:
62         print('三角形')
63         ## 显示'三角形'
64         tm.display_buf = (0x80, 0xc0, 0xa0, 0x90, 0x88, 0x84, 0x82, 0x81,
65                             0x81, 0x82, 0x84, 0x88, 0x90, 0xa0, 0xc0, 0x80)
66         tm.update_display()
67
68     elif shape_length == 4:
69         print('矩形')
70         ## 显示'矩形'
71         tm.display_buf = (0x00, 0x00, 0x00, 0x00, 0xff, 0x81, 0x81, 0x81,
72                             0x81, 0x81, 0x81, 0xff, 0x00, 0x00, 0x00, 0x00)
73         tm.update_display()
74
75     elif shape_length >= 6:
76         print('圆')
77         ## 显示'圆形'
78         tm.display_buf = (0x00, 0x00, 0x00, 0x00, 0x1c, 0x22, 0x41, 0x41,
79                             0x41, 0x22, 0x1c, 0x00, 0x00, 0x00, 0x00, 0x00)
80         tm.update_display()
81
82     else:
83         ## 清屏
84         tm.display_buf = [0] * 16
85         tm.update_display()
86         print('None')

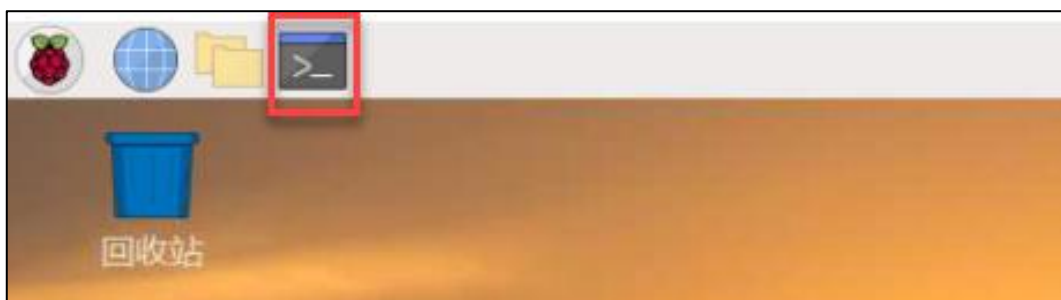
```

### 3. Operation Steps

**i** The entered command must pay attention to case sensitivity and space.

1) Turn on the robot and connect to Raspberry Pi desktop with VNC.

2) Click  or press “Ctrl+Alt+T” to open LX terminal.



3) Enter “cd TonyPi/Extend/” command and press “Enter” to come to the directory of the game programmings.

```

文件(F) 编辑(E) 标签(T) 帮助(H)
*****
*          官方网站: www.hiwonder.com          *
*  Hiwonder 官方店铺: huaner.tmall.com          *
*  幻尔科技 官方微信: 幻尔科技Hiwonder          *
*          官方哔哩: space.bilibili.com/470819482 *
*
*****
pi@raspberrypi:~ $ cd TonyPi/Extend/

```

4) Enter “sudo python3 ShapeRecognition.py” command, and then press “Enter” to start the game.

```

文件(F) 编辑(E) 标签(T) 帮助(H)
*****
*          官方网站: www.hiwonder.com          *
*  Hiwonder 官方店铺: huaner.tmall.com          *
*  幻尔科技 官方微信: 幻尔科技Hiwonder          *
*          官方哔哩: space.bilibili.com/470819482 *
*
*****
pi@raspberrypi:~ $ cd TonyPi/Extend/
pi@raspberrypi:~/TonyPi/Extend $ sudo python3 ShapeRecognition.py

```

5) If want to exit the game, press “Ctrl+C” in the LX terminal. Please try multiple times if fail to exit.

## 4. Project Outcome

After the program is started, the robot's camera will recognize the object. When the shape of the object is recognized as triangle, rectangle and circle, the dot matrix module will display the corresponding shape. Otherwise, it will not display.