7.1 QR code recognition

1. 2-dimensional bar code is a black and white graphic that records data symbol information using a specific geometric figure distributed on a plane (in a two-dimensional direction) according to certain rules; it can be used skillfully in coding. The concept of "0" and "1" bit streams, which form the basis of computer internal logic, uses several geometric shapes corresponding to binary to represent text numerical information, and automatically reads the information through image input equipment or photoelectric scanning equipment. Automatic processing: It has some common features of barcode technology: each code system has its own specific character set; each character occupies a certain width; it has certain verification functions, etc. At the same time, it also has the function of automatically identifying different lines of information and processing graphic rotation change points. The QR code recognition technology of this project is mainly aimed at the two-dimensional QR Code (Quick Response Code) to obtain and print the information of the QR code. Now that the QR code is recognized, how is the QR code made? Then let's teach you how to make your own QR code. Computers are used to generate QR codes: Use forage QR codes to make your own QR codes. The following will teach you how to make them step by step. Just follow the order of the pictures below.

Figure 1-1 Free online QR code generator

2. QR code recognition technology

Nowadays, QR codes are active in the streets and alleys around us. Basically, we deal with QR codes every day, such as bike sharing, mobile payment, etc. So how to realize the recognition of QR codes? In fact, if we carefully observe the characteristics of QR codes, we may see some characteristics. Each QR code has three positioning blocks. When identifying a QR code, you will first find the positioning block, then start to read the encoding information of the QR code, and then follow certain rules to decode (translate) the encoding information of the QR code. The decoded content is what we want. Content, you can jump to the website, view text information, etc. The principle of QR code recognition is based on the above process. Of course, there are also many open source QR code recognition tools. As a maker, we should learn to use existing tools to make. Some people will say that this is not Mr. Wu Liu's lack of understanding. In fact, it is not the case. The knowledge in today's era is updated very quickly, and it is difficult for us to learn systematically. As a maker , what we naturally enjoy is the process of creating works and realizing them. Wouldn't it be more fun if we use existing software development kits to speed up our development and quickly implement our ideas.

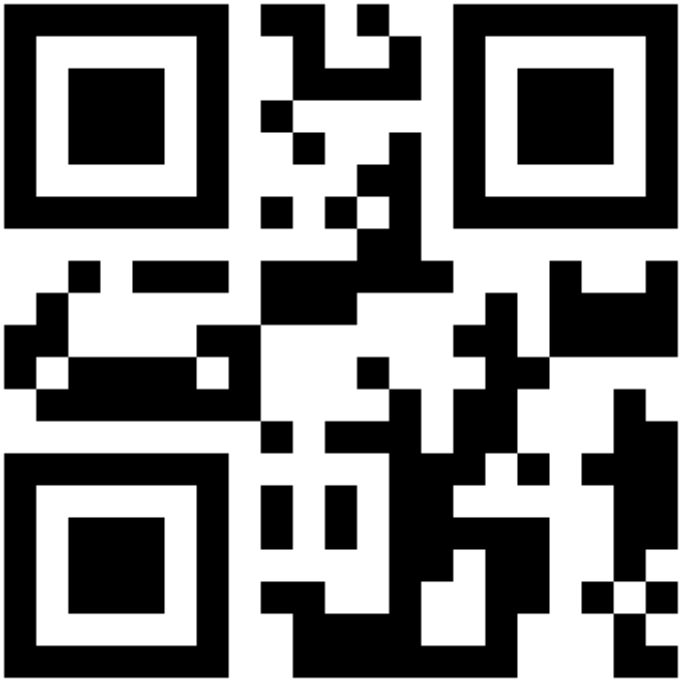
7.2. Operation steps

You can generate the QR code yourself by following the above QR code generation steps. You can also use the QR code below

front-left

front-right

middle



7.2.1. Start

jetson motherboard/Raspberry Pi 4B

Start the robot arm handling tutorial (robot side)

```
roslaunch transbot_mono arm_move.launch
```

Raspberry Pi 5

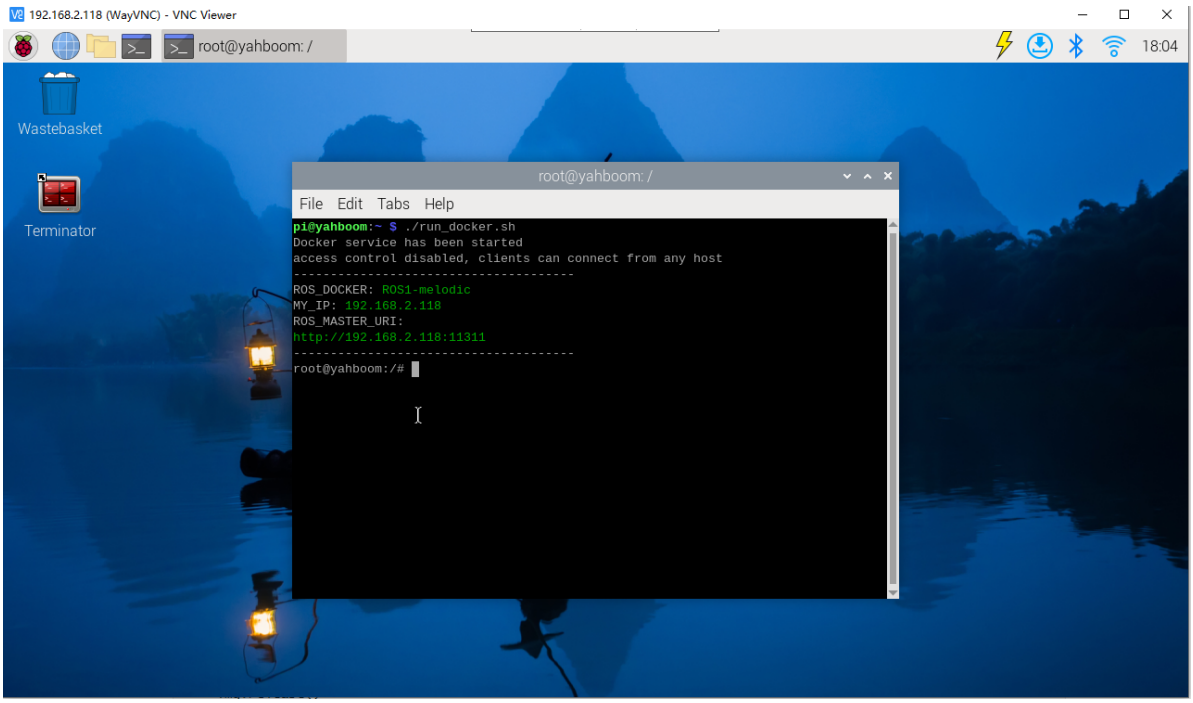
Before running, please confirm that the large program has been permanently closed

Enter docker

Note: If there is a terminal that automatically starts docker, or there is a docker terminal that has been opened, you can directly enter the docker terminal to run the command, and there is no need to manually start docker

Start docker manually

```
./run_docker.sh
```




```
roslaunch transbot_mono arm_move.launch
```

7.2.2. QR code recognition

After starting the program, point the QR code at the camera, and transbot SE will sound a whistle after recognition. Then send the building blocks to the clamping jaws. transbot SE will grab the building blocks, then transport them to the designated location and place the building blocks down.


img
middle (QR CODE)
(x=280, y=151) ~ R:255 G:255 B:255