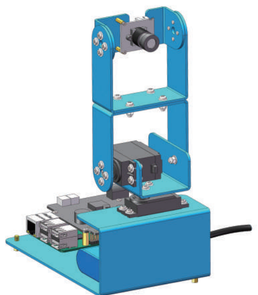
YAHBOOM

Pi-motion
Raspberry Pi AI camera kit

Manual



① Please read this manual carefully before use
② The company reserves the right to explain the instructions
③ Product appearance, please prevail in kind
④ Please keep it well after reading

APP Download

Android Please use the browser to scan the QR code to download and install; Apple please use camera to scan the QR code to enter the APP Store to download or install or search for "Pi-motion" in the APP Store.

About us

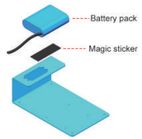
Shenzhen Yahboom Technology Co.,Ltd. is a professional company specialized in open source hardware and maker education. We have two Enterprise Concept: Turn ideas into reality and Let more children become maker. Company's products now have covered early childhood education, intelligent robot education, university automation technology education, and so on. In addition, the company provides long-term help and products for colleges and training institutions to develop a training program.

Package list

	Raspberry Pi 3B+ x1(Option)		Expansion board x1
	Aluminium alloy x1		Metal servo x2
	Servo tiller x2		Battery pack x1
	Camera+cable x1		Speaker x1
	Speaker cable x1		Charger x1
	Battery sticker x1 Speaker sticker x1		Open spanner x1
	Screwdriver x1		Screw package x1
	Bearing x2		Copper pillar package x1
	16G TF card x1(Option)		

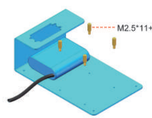
Installation step

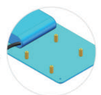
01 Battery installation



Design Sketch

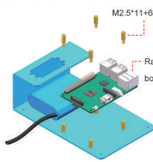
02 Mainboard support installation

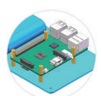




Design Sketch

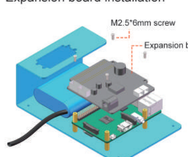
03 Raspberry Pi board installation





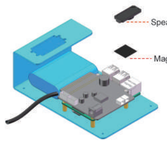
Design Sketch

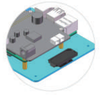
04 Expansion board installation



Design Sketch

05 Speaker installation



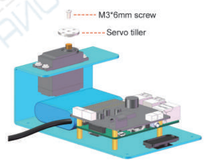


Design Sketch

06 First degree of freedom servo installation

Design Sketch

07 Servo tiller installation

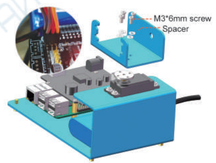


Design Sketch

08 Second degree of freedom servo and aluminum alloy plate installation

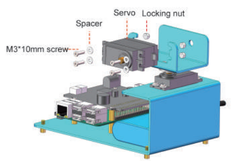
When installing this step, first insert the battery pack to power the Raspberry Pi, then insert the bottom servo wire into the expansion board S1 pin.
(Note the SD card insertion and servo wire direction of the Raspberry Pi)

Follow the instructions in the "First Trial" link to the AI Suite, and then click the Pause button on the control interface. As shown on the left, the servo will be selected to the initial state, and then the aluminum alloy will be installed as follows.



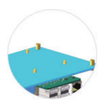
Design Sketch

09 Second degree of freedom servo installation



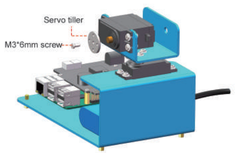
Design Sketch

10 Base support column installation



Design Sketch

11 Servo tiller installation



Design Sketch

12 Camera mounting plate combined with servo tiller

When installing this step, first insert the servo wire into the expansion board S2 pin (note the direction of the servo wire)

After connecting the AI kit in "Step 8", click the pause button on the control interface. As shown on the left, the servo will be selected to the initial state, and then the aluminum alloy will be installed as follows.

Design Sketch

13 Camera lower fixed plate installation

Design Sketch

14 Camera upper fixed plate installation

Design Sketch

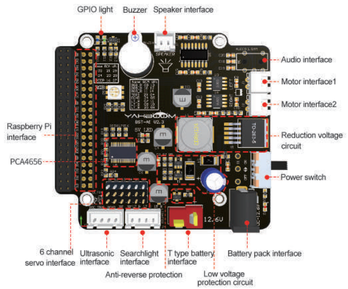
15 Camera installation

Design Sketch

16 Camera fixed

Design Sketch

Expansion board



First Trial

To view the local network address and subnet address through an existing device, the available methods are:

1.Android phone: "Settings" - "WLAN" - "Details" - "IP address";

2.IOSphone: "Settings" - "WIFI" - "Details" - "IP address";

3.Windows computer: "Start" - search for "cmd" - enter "ipconfig";

4.macOS computer: punch terminal - enter "ifconfig",

If the queried network address is: "192.168.1.xxx", enter the command "sudo ifconfig" at the Raspberry Pi terminal to query the Raspberry Pi network address:

If the Raspberry Pi connects to the local network through the network cable, the Raspberry Pi's network address is 192.168.1.55.

If the Raspberry Pi accesses the local network via wifi, the Raspberry Pi's network address is 192.168.1.66.

（Note: If the queried network address is not: "192.168.1.xxx",Please refer to the "First Trial" guide of "https://www.yahboom.net/study/Pi_Motion" to set the static IP address of the Raspberry Pi.）

Mobile control

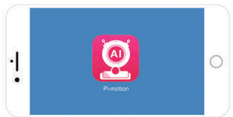
Download and connect

Android

Download the [Android Pi-motion Remote Control APK] QR code on the cover of the manual to download the remote control software.

iOS

Search and download [Pi-motion] in the App Store.

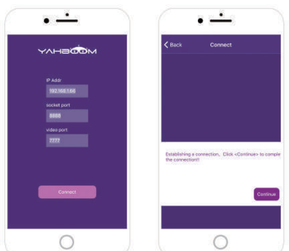


Start the application, enter [Network Address], [Communication Port], [Video Port], click [Link] and then [Continue]. The default link information is as follows. For more information, please read

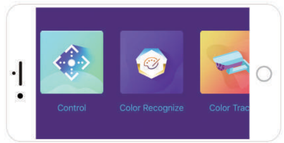
"First Trial" at "https://www.yahboom.com/study/Pi_Motion".

Network address: 192.178.1.55 (network cable), 192.168.1.66 (WI-FI)

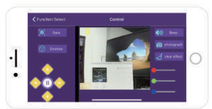
Communication port: 8888, video port: 7777



APK function selection interface

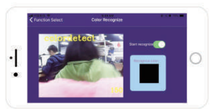


1. Control:Click Face to enter the face recognition mode, the camera follows the face to move, click Emotion to add an expression to the face detected in the camera, clicking clear effect or exiting this page will return the camera to its default state without any special effects.Click photograph to take a photo, the photo will be stored locally in the Raspberry Pi Under "/home/pi/Adafruit_Python_PCA9685/picture".



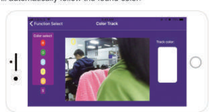
Control

2. Color recognize: Place five colors of colored paper or objects such as "red", "green", "blue", "yellow" and "orange" in front of the camera, and the cyan area on the screen will become the recognized color.



Color recognize

3. Color Track: Click one of the five buttons "Red", "Green", "Blue", "Yellow" and "Orange". The camera will automatically follow the found color.



Color Track

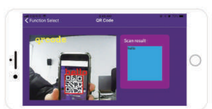
4. Speech: Enter text in the text box and click "Play". The Raspberry Pi can broadcast the input text.

Speech

5. Email Warning: Enter the email address in the text box and click "Start". When the face is recognized, Yahboom will send an email with the picture to the email address you entered. The interval between each email will not be shorter than 5 minutes. Exiting this page or clicking "Close" will stop the function of this module. PS: Some email addresses may need to be manually "Trust" on the mailbox side to display the image.

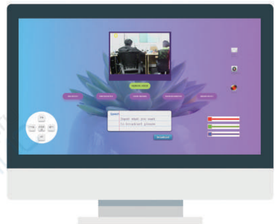
Email Warning

6. QR Code: Place the QR code in front of the camera, the QR code information will be displayed in the text box, and the Raspberry Pi will also broadcast the QR code. Note: This application only supports English, URL, and number. Chinese characters cannot be recognized by content.



QR code

PC control



Instructions:

1. Locate the Pi-motion module on the yahboom website, download the PC computer program, click "Pi-motion.exe" to install, and the "Pi-motion" shortcut appears on the PC desktop after the installation.

2. The connection mode of the computer is similar to that of the mobile phone. Enter [Network Address], [Communication Port], [Video Port] in turn, and click "Connect".

Network address: 192.178.1.55 (network cable), 192.168.1.66 (WI-FI)

Communication port: 8888, video port: 7777

Tutorial

The included tutorials for this product can be downloaded at

https://www.yahboom.net/study/Pi_Motion.

Since this product defaults to the self-starting adaptation app and the host computer's large program, please follow the steps below to close the large program process before learning the tutorial:

Step 1: The terminal enters "netstat -apn|grep 7777" to check the occupancy of port 7777.

If it is found that a process is using the port, please record the thread number.

Step 2: Enter "sudo kill -9 [process number]" to kill the process. Note that port 7777 may query multiple processes and must be killed.

When you no longer want large programs to be booted, you can use "sudo vim /etc/rc.local" to find the command line that starts the "Pi_motion.pyc" program, comment it out or delete it.

Notice and FAQ

Notice

1. Please follow the instructions and product installation tutorial to install.
2. Please pay attention to hardware safety during installation and learning, avoid power supply to the product before assembly is completed, and avoid short circuit between Raspberry Pi, extended version and battery interface. Please touch the circuit board after ensuring that your hands are dry and static-free.
3. Turn off the power when not using this product to avoid over-discharging the battery and reduce its service life.
4. The large program supporting the app and the host computer supports multiple apps to control it at the same time, but as the number of connections increases, the response speed of the Raspberry Pi will decrease.
5. When trying to play large programs, please make sure that the Raspberry Pi and the app (host computer) are on the same network segment. The smoothness of the video is directly related to the network speed.

FAQ

Question 1: When the installation, the servo is not calibrated?

A: Start the Raspberry Pi, connect the APP (host computer) with the Raspberry Pi network, and press the "Control Page" button of the APP ⏸ or the "STOP" button of the host computer to reset the two servos to the 90° position. Correct reset position: The camera is horizontally forward, and the camera head is vertically downward. As shown in the manual cover, please reassemble the camera according to the position after the servo is reset.

Question 2: Why is the program I downloaded running error?

A: Some program downloaded from the official website need to have the correct environment variables and dependent files. Please read carefully the steps of the official website to install related software or library files.

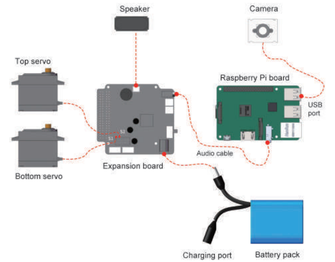
Question 3: Is my Raspberry Pi very stuck when running the program?

A: The huge amount of computation required by OpenCV is too much computational pressure for the Raspberry Pi CPU. And our program are basically applied to real-time video, so it is normal. Please ensure that the Raspberry Pi has good heat dissipation. Another possibility is that the Raspberry Pi runs too many processes, you can view and delete the process by following the steps below:

Step 1: The terminal inputs "top" to start the performance analysis tool. The process with the highest cpu occupancy rate is found in the display content, and the process ID is recorded.

Step 2: The terminal enters "sudo kill -9 [process number]" to kill the process. If you still feel that the video on the Raspberry Pi is serious, we talked about how to build a similar OpenCV development environment on a PC at "https://www.yahboom.com/build.html?id=2009&cid=257".

Connection



Lithium-ion battery safety specification

1. The battery pack is charged in-line. The charger interface can be charged by plugging directly into the battery's charging port.
2. Do not use the battery while charging to prevent the charger or battery pack from exploding.
3. When the voltage is around 9V, it needs to be charged in time. When the battery is fully charged, the battery voltage is about 12.6V.
4. When the device is not used for a long time, the battery cable should be unplugged. Because the battery in standby mode will also be worn out. The battery has not been used for a long time and needs to be fully charged before use.
5. When the battery is charging, the charger indicator lights up red, and when it is full, it lights up in green. After charging is completed, the charger and power supply should be unplugged in time to avoid overcharging and damaging the battery..
6. When charging the battery pack, remove the battery from the kit and ensure that the battery output connector is powered off and then charged.
7. Do not insert the battery charger into the expansion battery holder. The battery charger cannot directly supply power to the camera platform.

Solemnly declare: Any economic loss and safety accident caused by failure to comply with the above-mentioned lithium ion battery use specifications or operational errors shall be borne by the user.

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