8-DOF quadruped bionic spider robot

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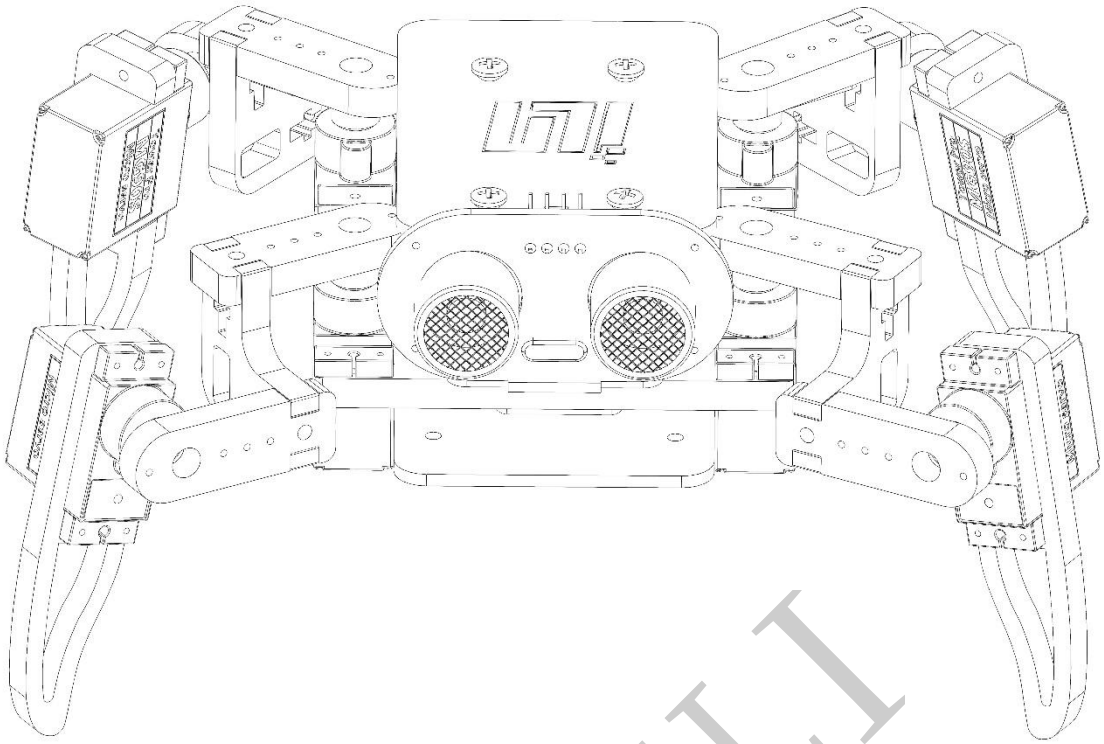


0 Statement

0.1 Use statement:

0.1.1 Please read this manual before use;;
0.1.2 The product appearance in the picture is for reference, please refer to the actual product;
0.1.3 The company reserves the right to interpret this manual. In case of product updates or upgrades, there without notification, please refer to the actual product you purchased,

0.2 Warranty statement:

0.2.1 Please check the quality of the product carefully after receiving the product. we will not provide warranty once used.;

0.3 Material statement

0.3.1 The copyright of this product material belongs to our company. “XINZHILI” is the brand and trademark, we will be held legally responsibility If copy or disseminate the matirial

without authorization,

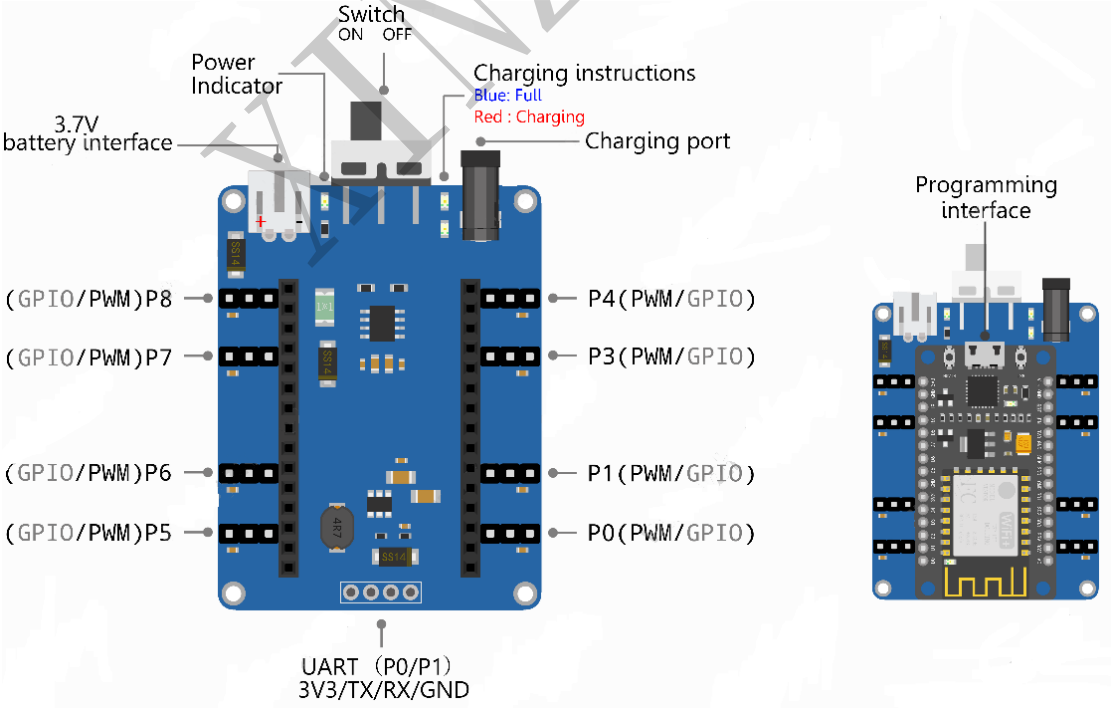
1 Kit list

1.1. Accessories Collection

No	name	quantity
1	NodeMcu	1
2	Servo shield	1
3	MG90S servo	8
4	Battery (702035)	1
5	MicroUSB cable	1
6	Charging cable	1
7	Screwdriver	1
8	M1.4 * 6 screw	16
9	M2.5 * 10 screw	4
10	M2.5 * 12 screw	8
11	M2.5 * 6 screw	8
12	M2.5 nut	16
13	M2.5 * 8+6 single-way copper pillar	4
14	M2.5 * 10 two-way copper pillar	4
15	Acrylic	1
16	Ligature	some
17	Bundle tube	2
18	3M glue	1
19	3D printing eyes	1

1.2 List of structural

1.3 Circuit description



The name of the servo motors extension board is

“NodeMcu Servo Shield”.

When the battery is not connected and the switch is turned to OFF, connect the USB charging cable and expansion board. Normally, the green LED on the expansion board is always on, the red LED is flashing, and the power indicator light is not on;

When the battery is not connected and the switch is turned to ON, connect the USB charging cable and expansion board. Normally, the green LED is always on, the red LED is flashing, and the power indicator light is always on;

When the battery is connected and the switch is turned to OFF, connect the USB charging cable and expansion board, keep charging status. normally you can see that the green LED is off and the red LED is always on. Note that the switch should be turned to OFF during charging.

2. Assembly steps

Step 1. Test the servo motors

Before testing the servo motors, you need to set up a development environment on the computer. Please open the tutorials provided by us and enter "Lesson0 Setting

Development Environment.pdf" under "03 Tutorial & Code → Arduino → Lesson 0 Setting Development Environment". Follow the instructions of the tutorial and complete the construction of the development environment.

After successfully completing the construction of the development environment, please open the tutorials and enter "Lesson1 Drives a Single Servo motors.pdf" under "03 Tutorial & Code → Arduino → Lesson1 Drives a Single Servo motors". Follow the instructions in the tutorial to complete the test of the servo motors.

After completing Lesson1, open the tutorials, enter "03 Tutorial & Code → Arduino → Lesson2 Wifi Control → Quadbot-E-V1.4", double-click to open QuadBot-E-V1.4.ino, and download the program into the singlechip as the same with previous two Lessons.

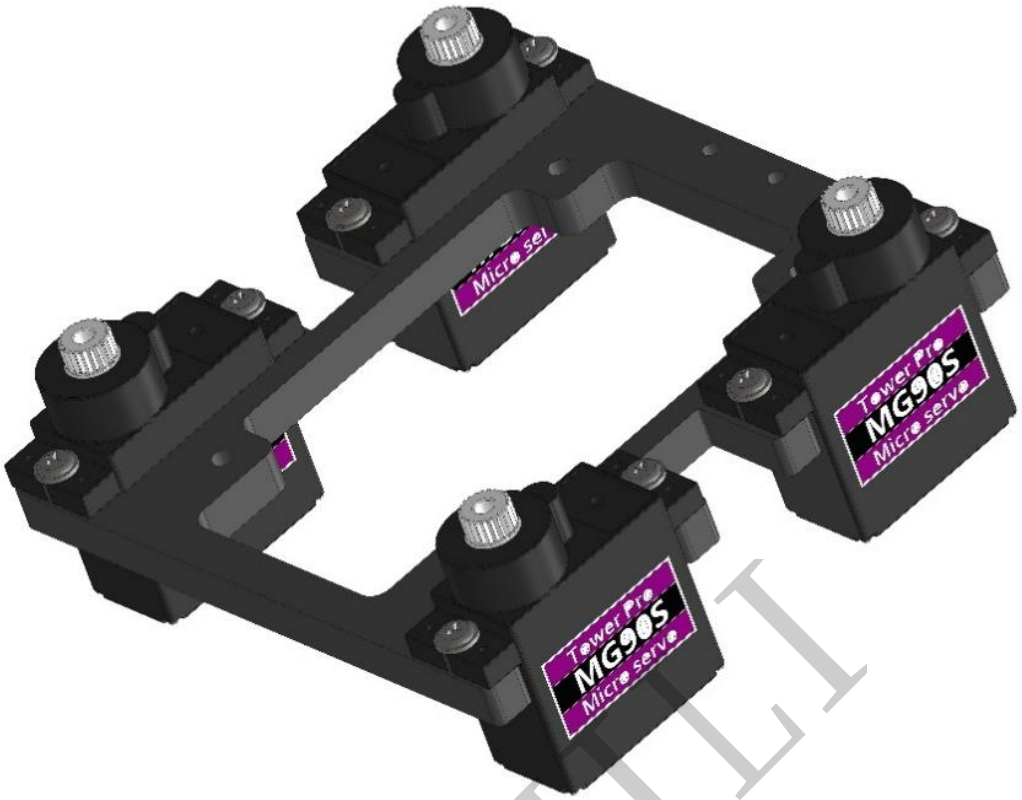
Step 2. Prepare for assembly

Tear off the protective paper stuck on the acrylic structure.

Step 3. Install the servo motors on the Body Middle

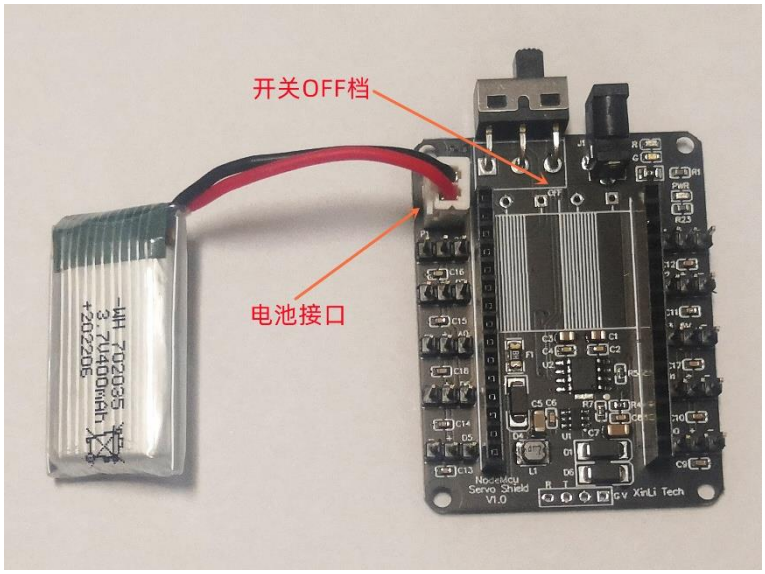
Install the servo motors on the body spindle and fixed by M1.7＊9 screws from servo bag, shown as below picture (notice: The rotation axis direction of the servo motors shall be in the same direction as shown in the picture, the rotating shaft of the servo motors is closer to the outer edge of the long shaft of the Body Middle)

The appearance after installation is shown as below picture

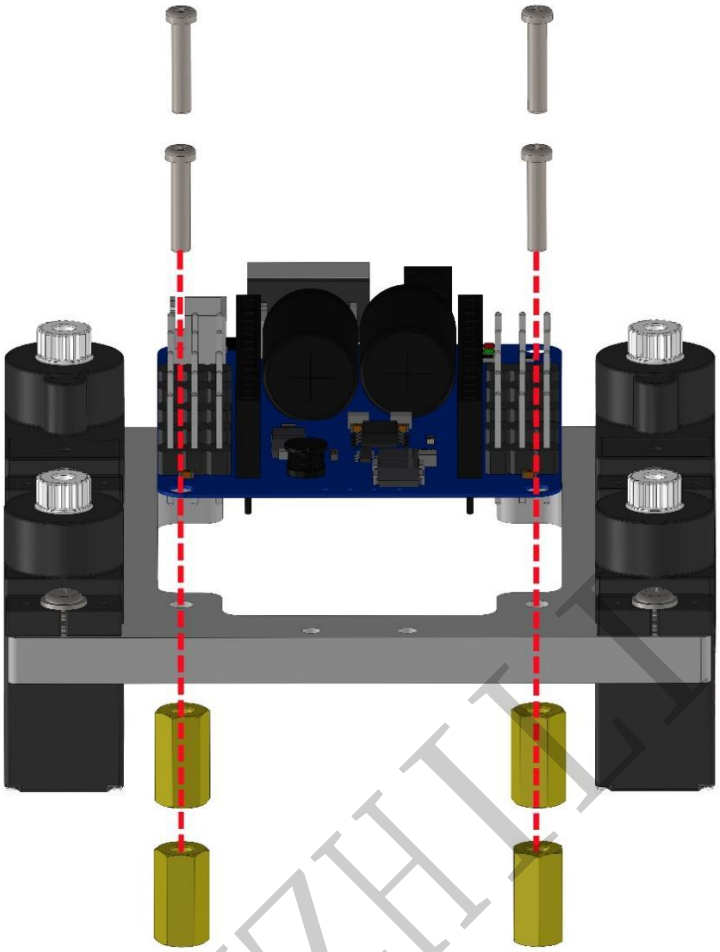


Step 4. Install the servo motors extension board

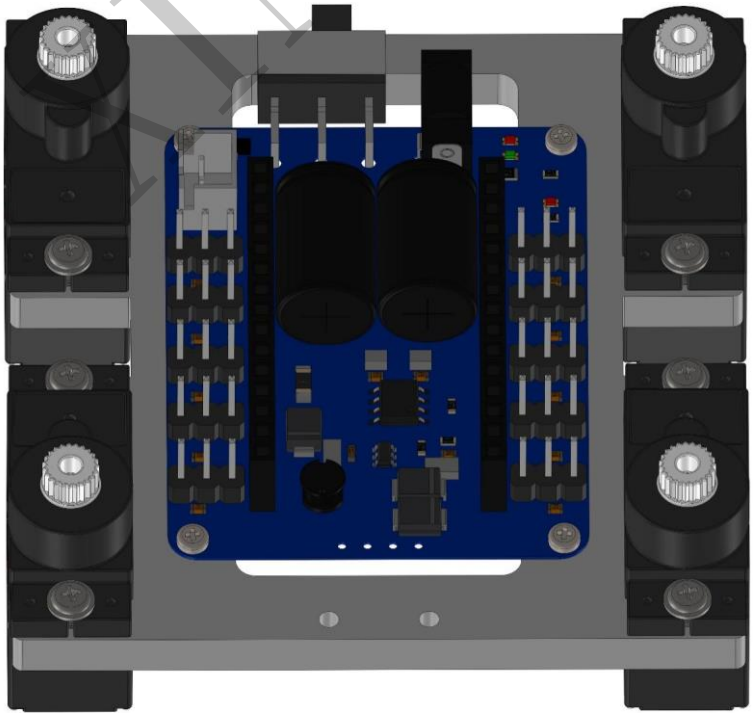
Turn the switch to OFF, and connect the battery to the servo motors expansion board, shown as below picture.



Firstly, using 3M glue to stick the battery to the back of the servo motors expansion board. Then use four M2.5 * 10 screws and four M2.5 * 10 two-way copper pillar to fix the expansion board on the Body-Middle, shown as below picture

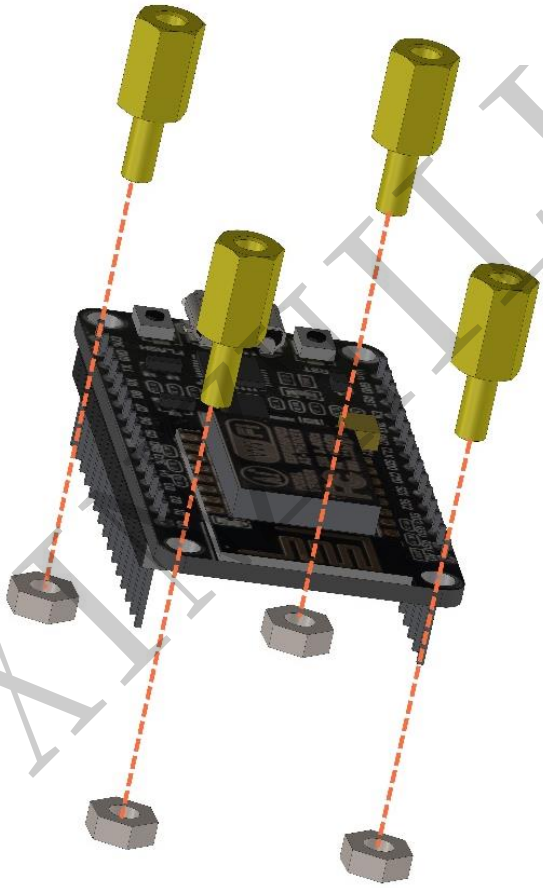


The appearance after installation is shown as below picture

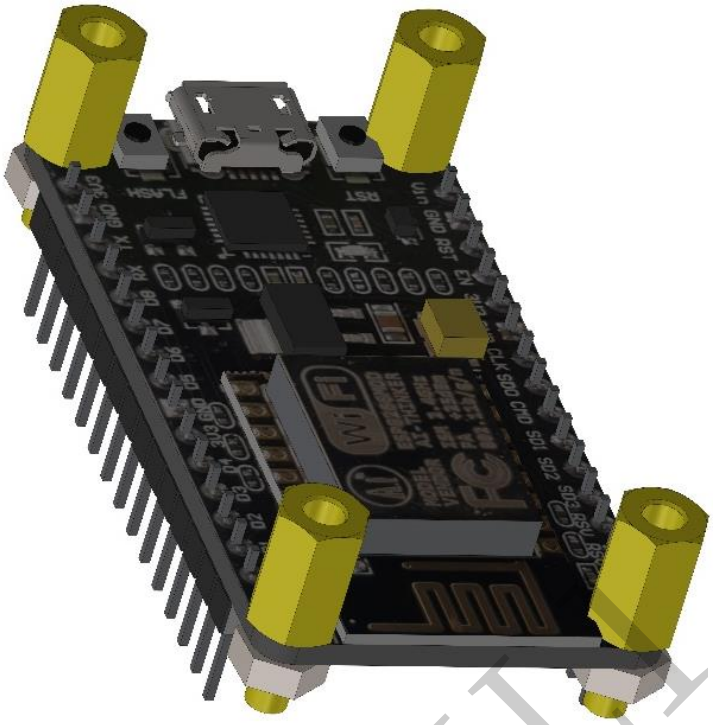


Step 5. Install NodeMCu

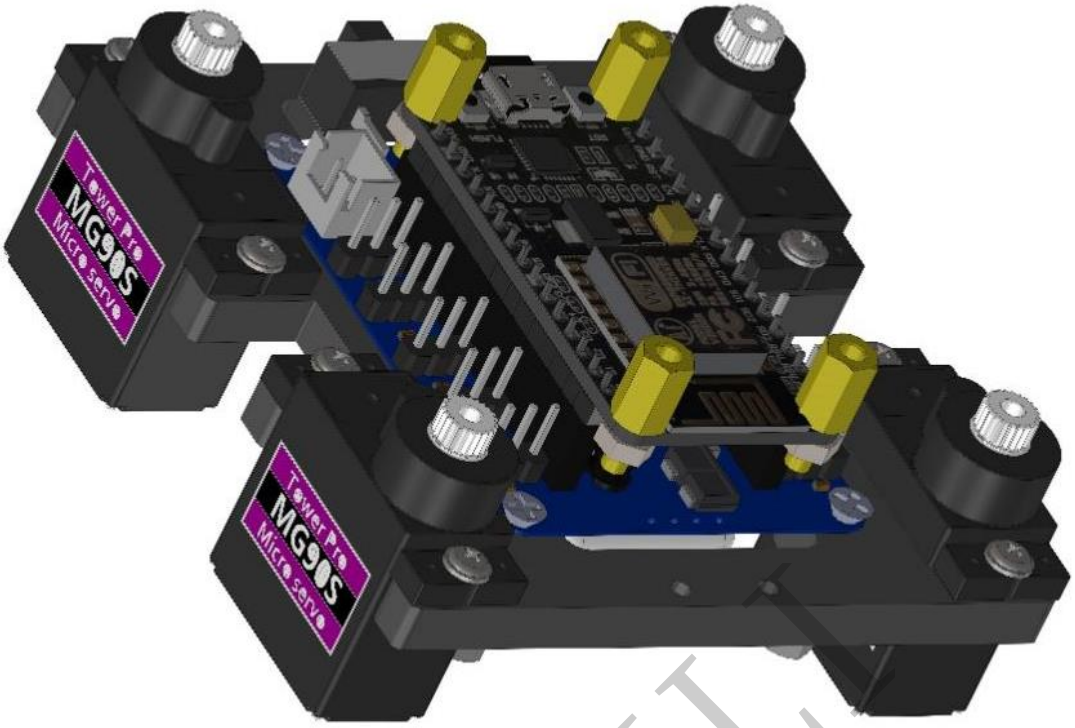
Fix four M2.5 * 8+5 single-way copper pillar and four M2.5 nuts on the circuit board through the four positioning holes of the NodeMCu circuit board, shown as below picture.



The appearance after installation is shown as below picture

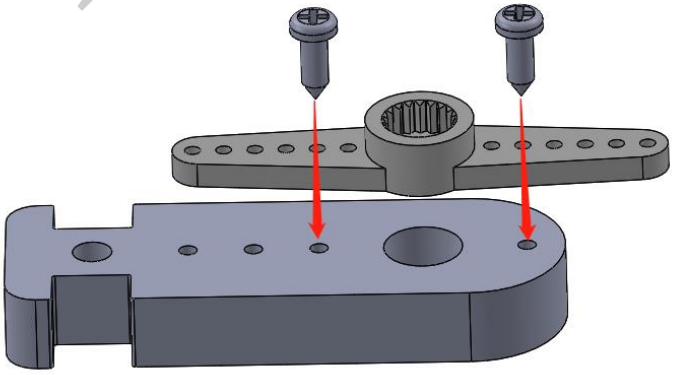


Then plug it into the socket of the servo motors expansion board, the USB port on the NodeMCu circuit board and the switch on the servo motors expansion board are on the same side, shown as below picture

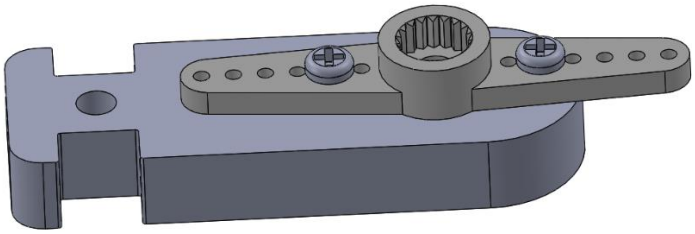


Step 6. Install the rudder blade on Coxa

Fix 8 servo motors rockers and 8 Coxa structural together with three M1.4 * 6 screws, shown as below picturein the figure below



The appearance after installation is shown as below picture

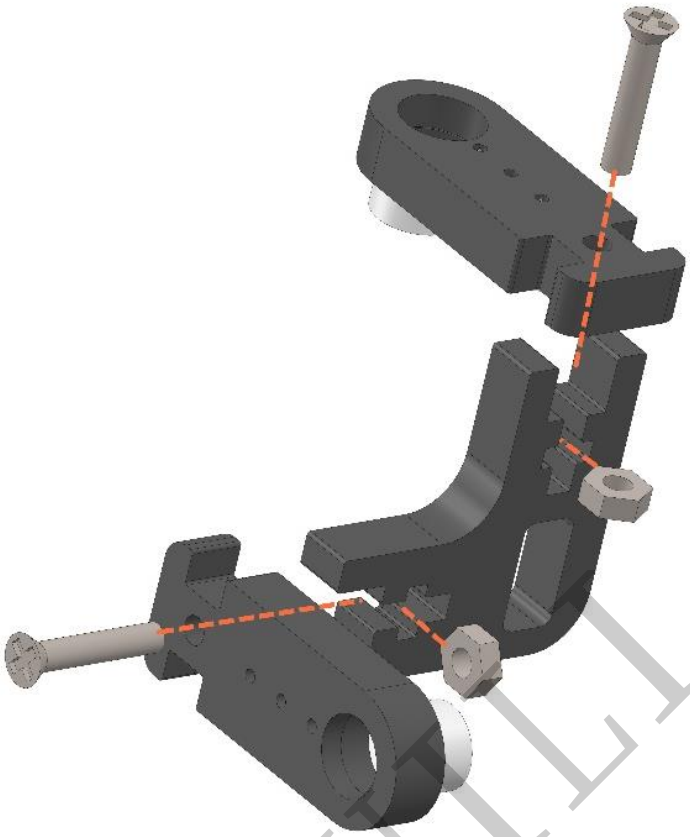


Cut the rudder blade extending out of the structure

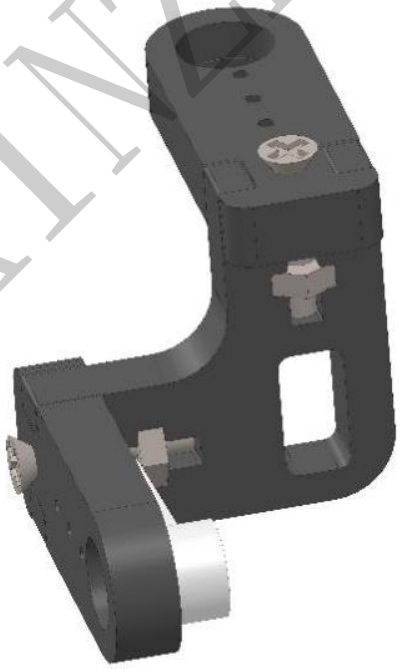
The appearance after installation is shown as below picture

Step 7. Install Coxa and Femur

Fix the structural Coxa and structural Femur together by M2.5 * 12 screws, shown as below picture

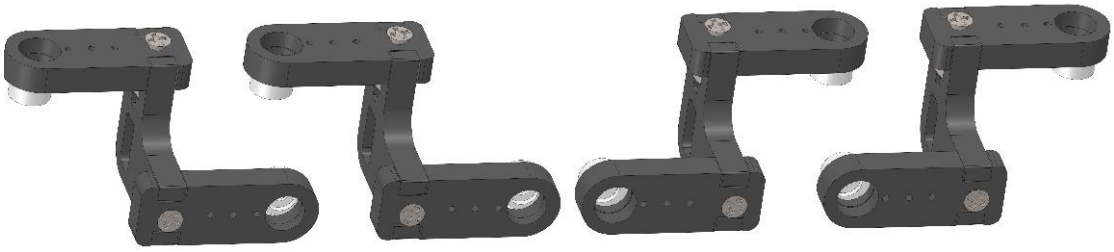


The appearance after installation is shown as below picture



Complete install the other three as the same with previous step, Pay attention to the direction, be sure same with the

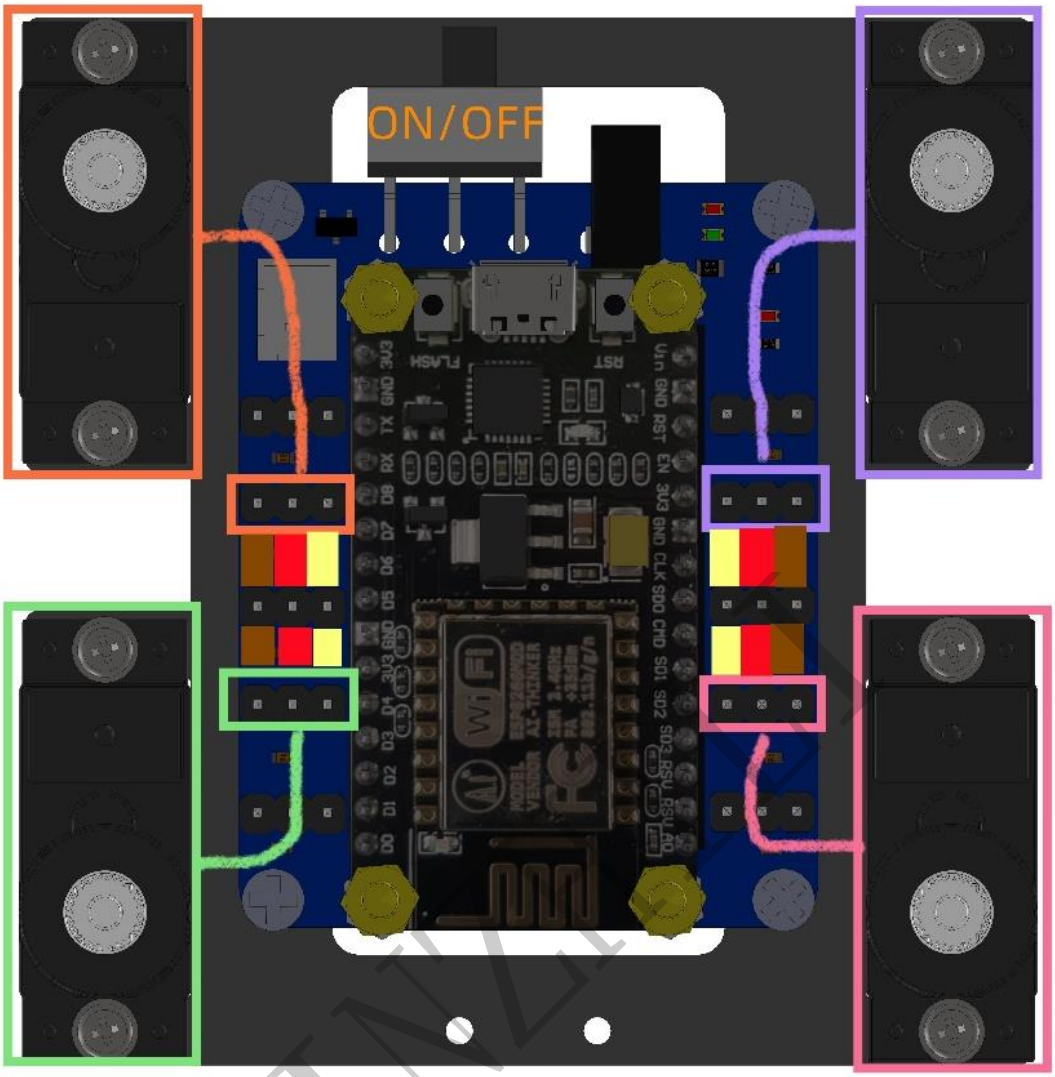
picture. The appearance after installation is shown as below picture



Step 8. Connect the four servo motors on the Body Middle with the steering gare expansion board

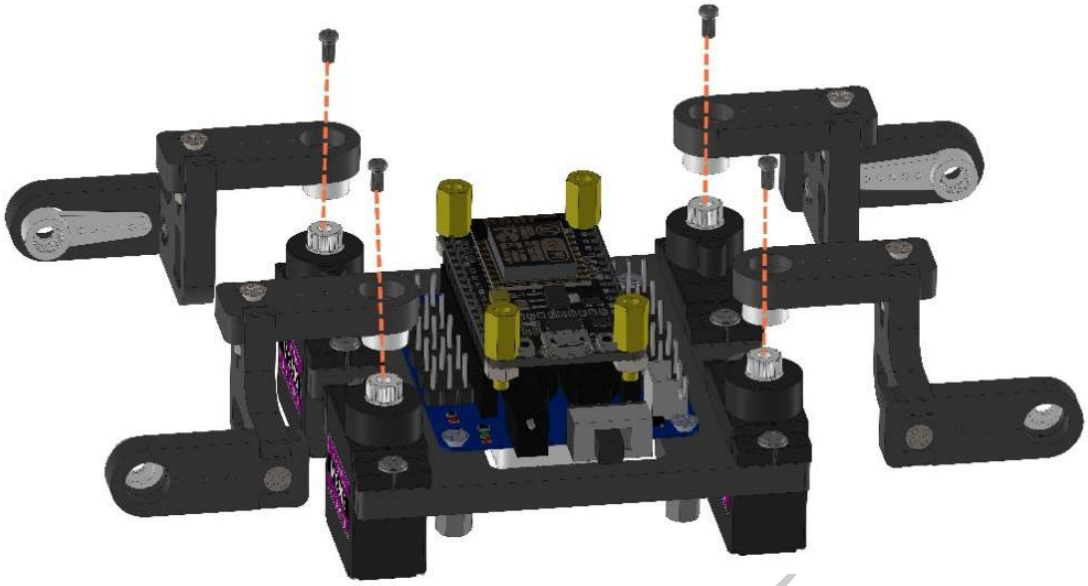
Connect the battery, insert the servo motors cable into the board, pay attention to the color! Then turn on the switch and turn it off after 5 seconds! The purpose is to reset the servo motors angle! If not, the posture will be wrong after installation! shown as below picture

(please in sure that the steps of servo motors connecting cable in turn! on the basis of marked color the brown is GND, the red is VCC, and the yellow is the signal line.)

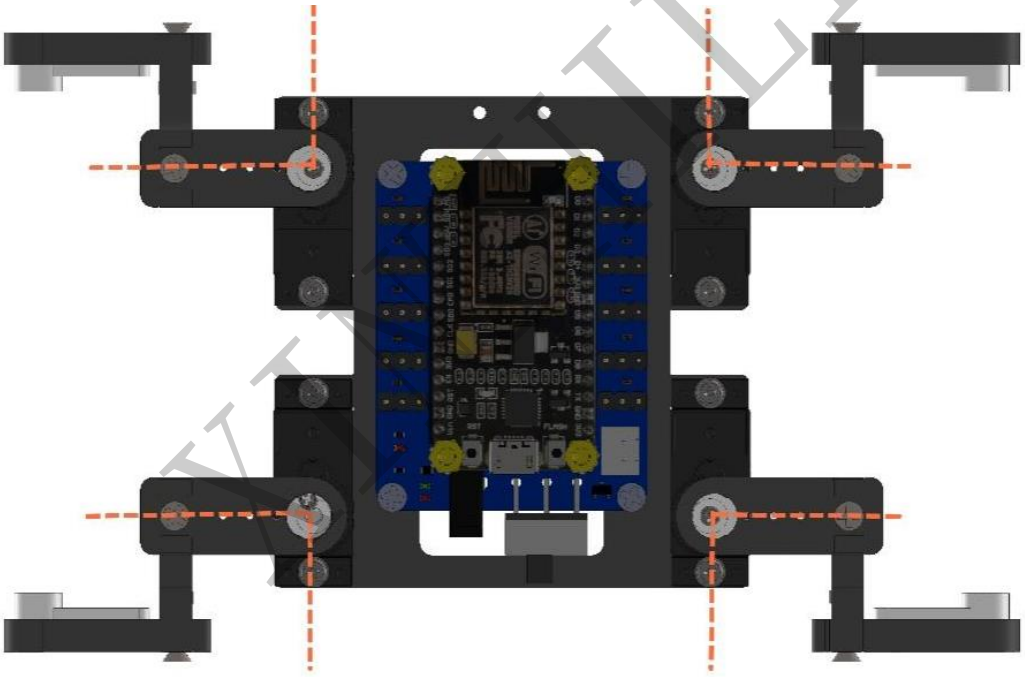


Step 9. Connect the four legs

Install the servo motors rocker according to the angle shown as below picture, and the servo motors shall be vertically with the servo motors rocker as far as possible. (Note: Do not rotate the servo motors when installing the servo motors rocker, or repeat the previous step.) Fix the rocker with screws



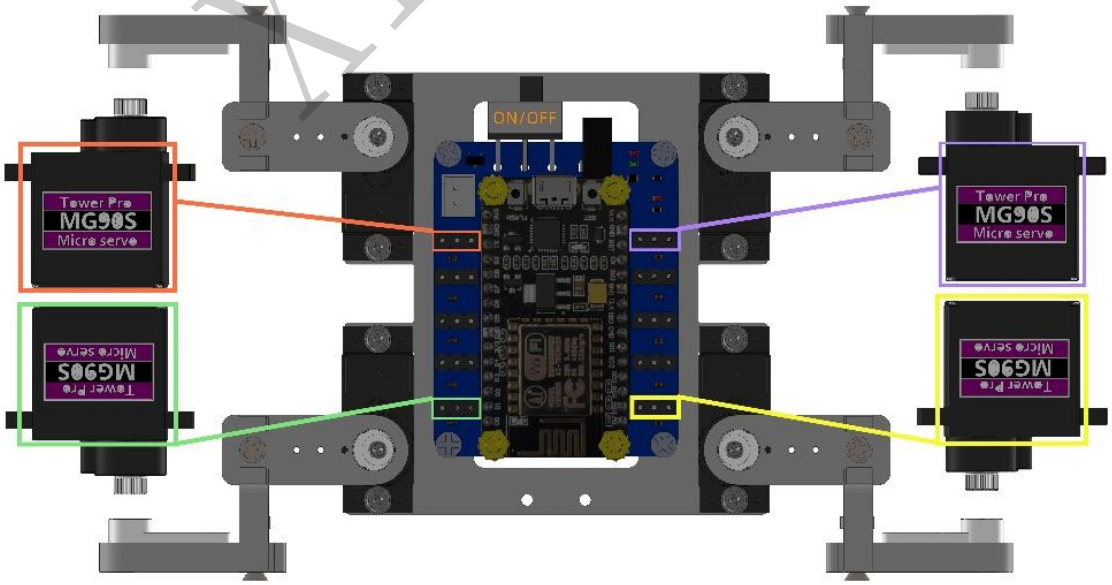
The appearance after installation is shown as below picture



Step 10. Connect the other four servo motorss to the servo motors expansion boards

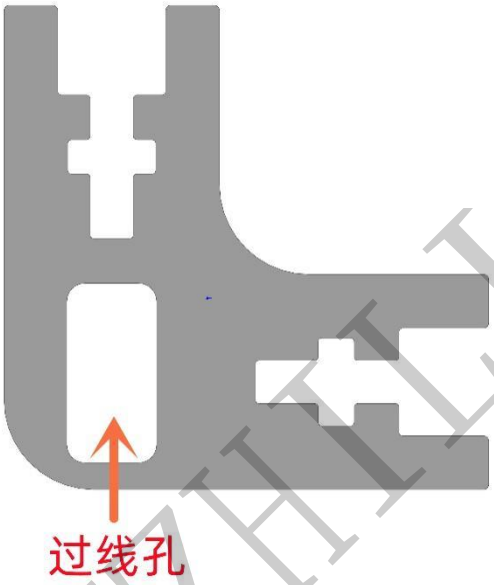
Insert the servo motors cable into the board, pay attention to the color! Then turn on the switch and turn it off after 5 seconds! The purpose is to reset the servo motors angle! If not, the posture will be wrong after installation! This step is necessarily

(please in sure that the steps of servo motors connecting cable in turn! on the basis of marked color the brown is GND, the red is VCC, and the yellow is the signal line.)

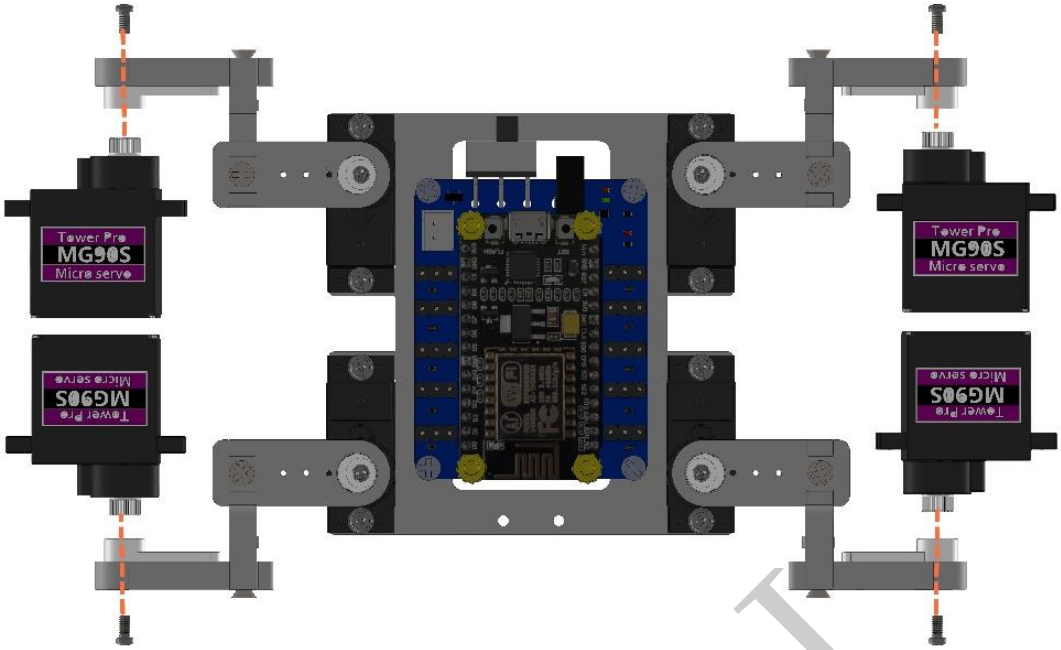


Step 11. Install the other four servo motorss

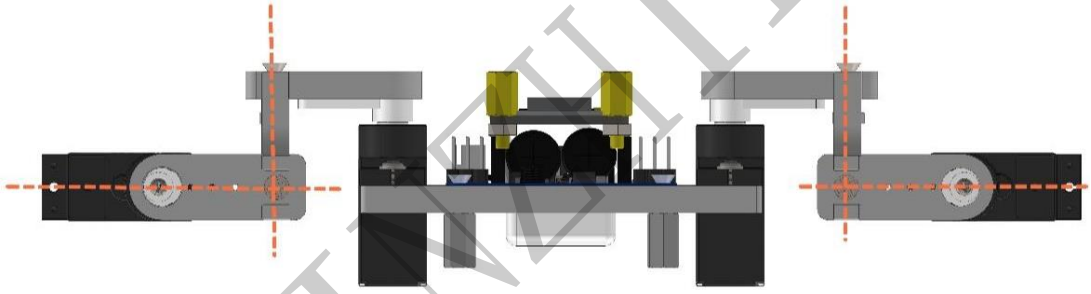
Before fixing, please pass the cables on the servo motors through the holes in the leg structure, shown as below picture.



Install the servo motors according to the angle shown as below picture

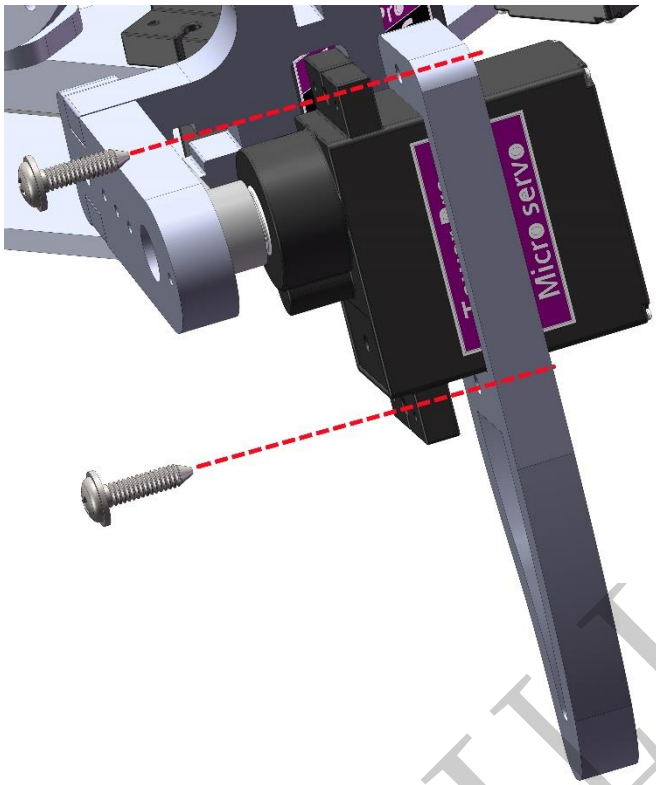


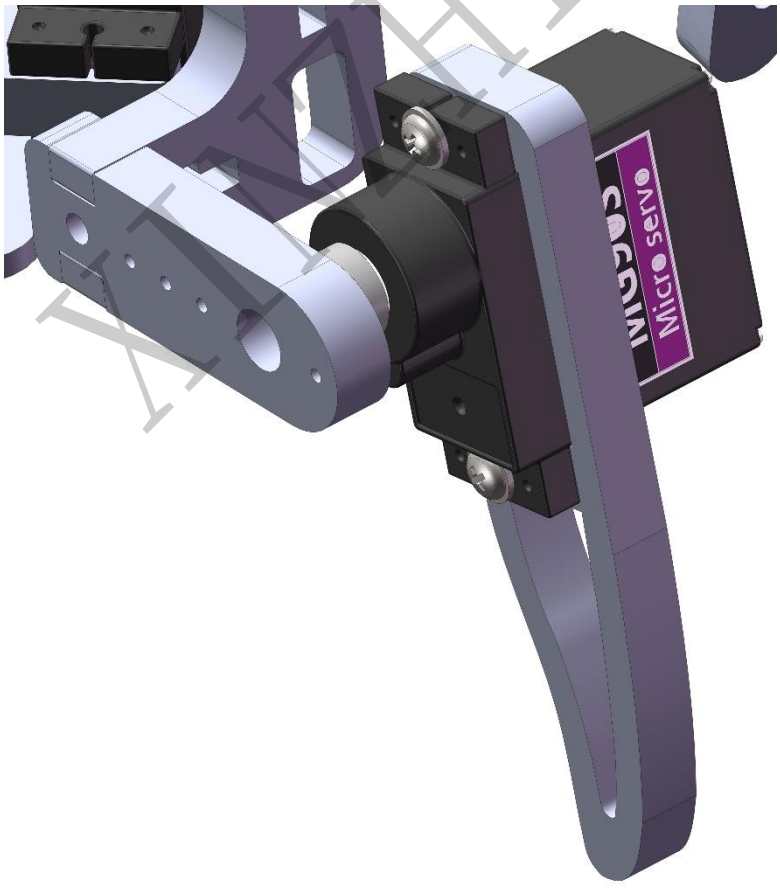
The appearance after installation is shown as below picture



Step 12. Install the four legs

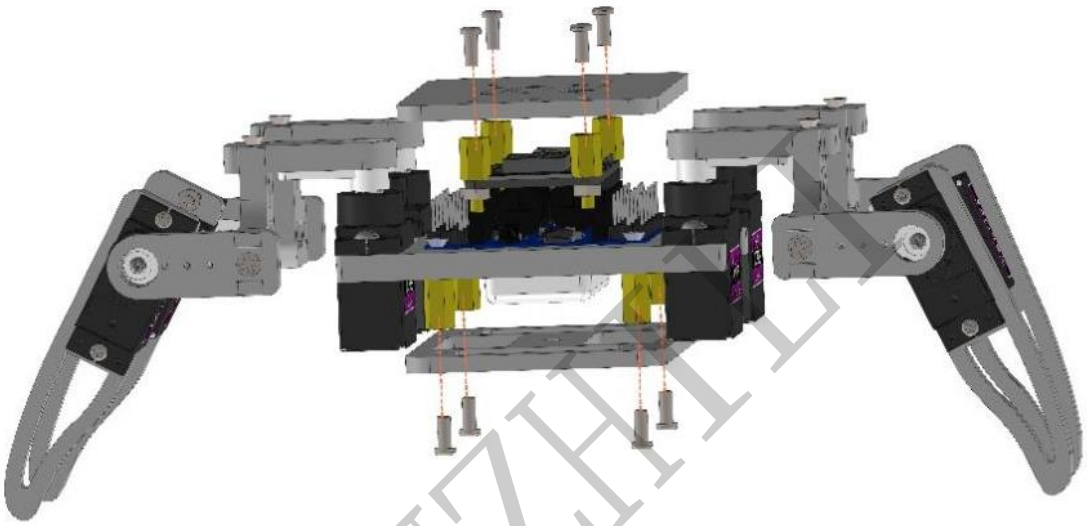
Install the structural Tibia with pointed screws from the servo bag, for example, shown as below picture



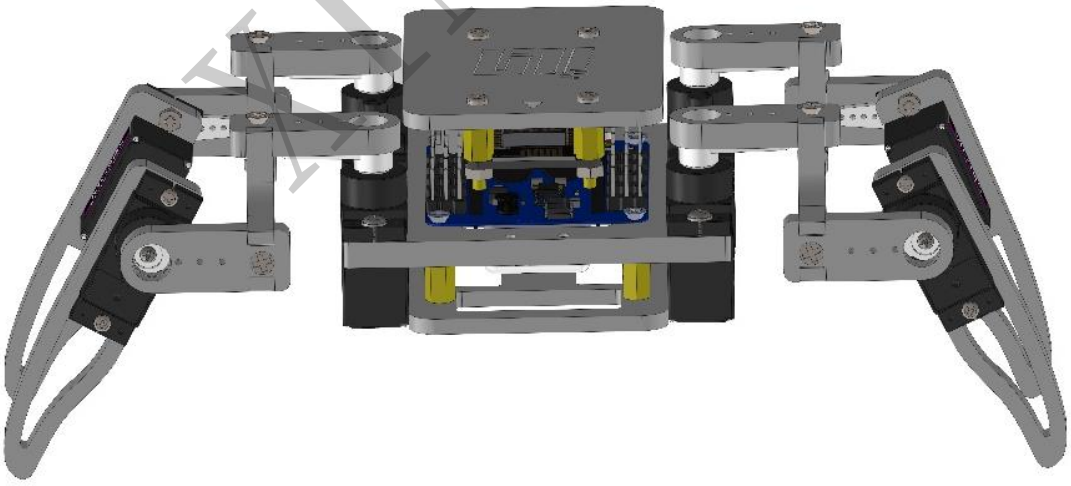


Step 13. Install the Body Top and Body Bottom

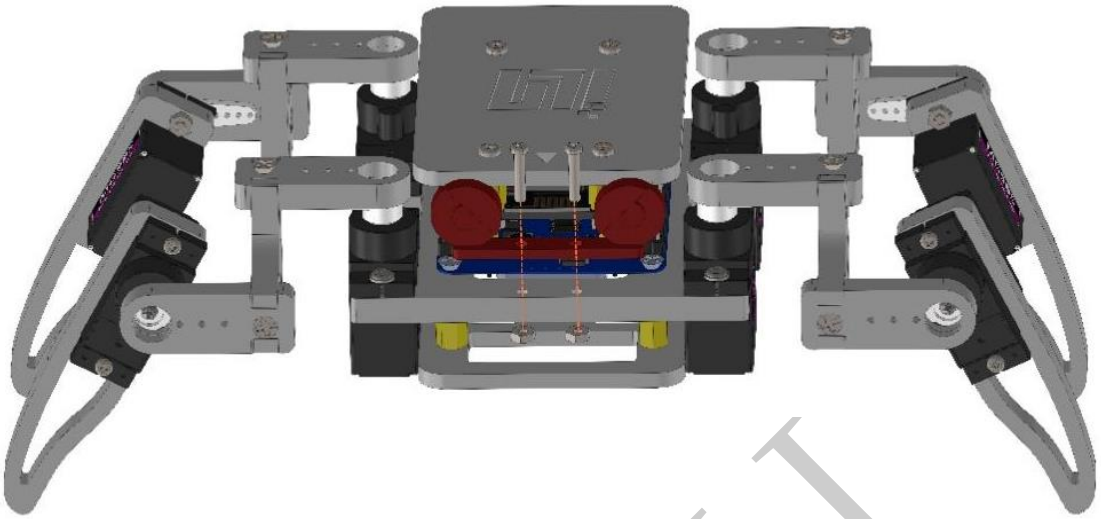
Arrange the cables and install the structural Body Top and Body Bottom, shown as below picture



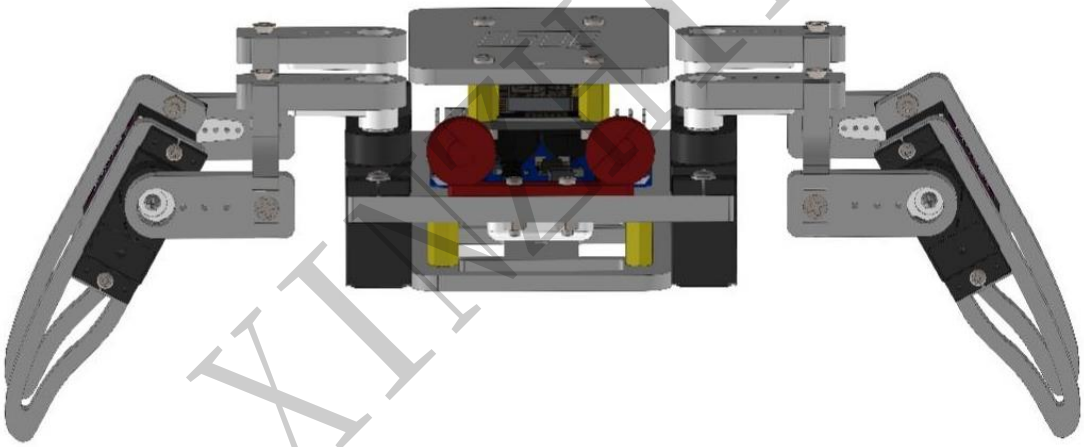
The appearance after installation is shown as below picture



Step 14. Install the eyes



The appearance after installation is shown as below picture



Finally congratulate that you finish installing the quadruped robot

3 Control experience

Fully charge the battery. Turn on the switch. If you use

the iPhone to control, it is only supported use the web app to control temporarily, we will update the ios app as soon as possible; If you use an Android phone, you can use both web page and APP to control.

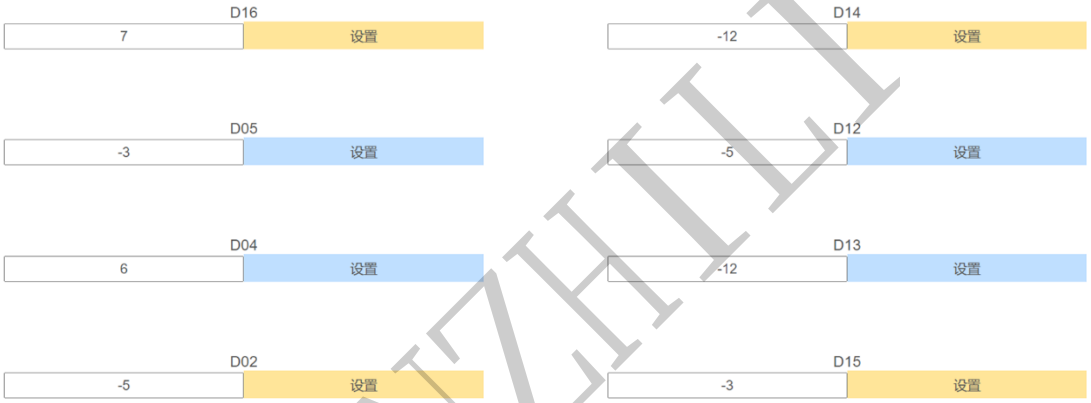
3.1 Use web page control

Use the mobile phone or computer scans WIFI (turn off shared networks such as GPRS and make sure that WIFI is the only network used), connects the wifi hotspot named “Robot XXX”, the password is 12345678, shown as below picture


WLAN
WLAN
WLAN+
提升网络智能连接体验
已开启
可用 WLAN 列表
HUAWEI
已连接 (网络质量好)
Robot - 3ECE
加密
wangjiahao
加密
yao
加密
CU_rBkS
加密
CU_YcEE
加密
ganggang
加密
扫描
WLAN 直连
配置
更多

3.1.1 Calibration

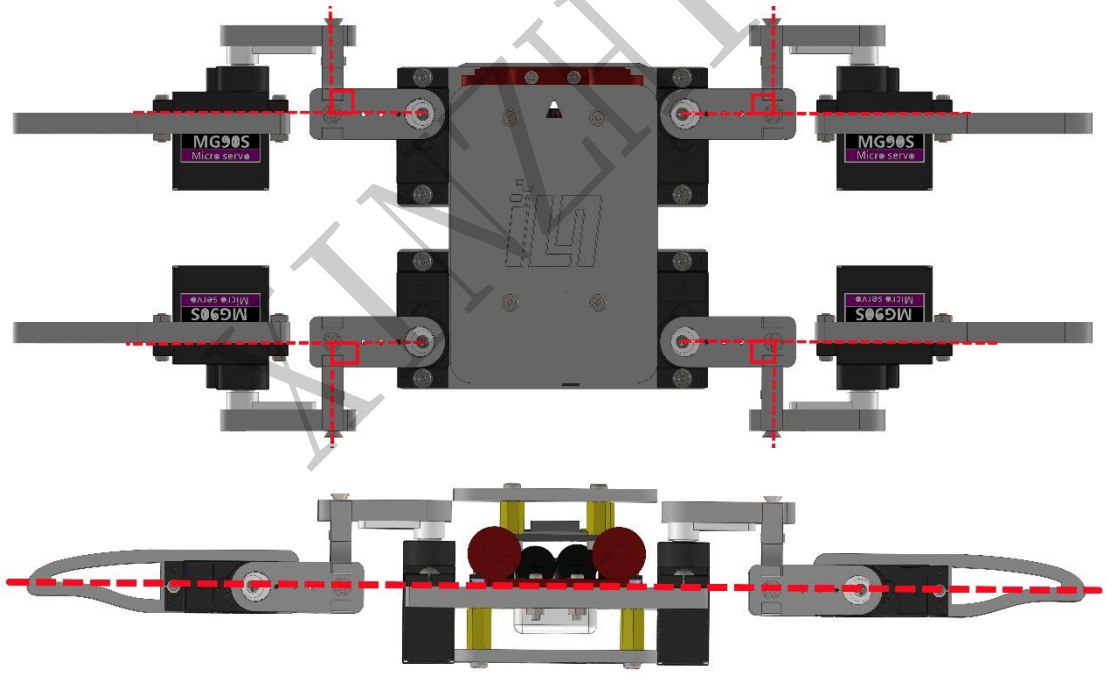
After connecting successfully, open the mobile phone or computer's web browser (finishing this step by computer is recommended), and enter the website http://192.168.4.1/setting ,And the interface as shown in below picture



Open another page at the same time and enter the website address http://192.168.4.1/zero , the interface as shown in below picture

Forward the robot head, for example with the servo motors calibration in the upper left, the other servo motorss are the same.

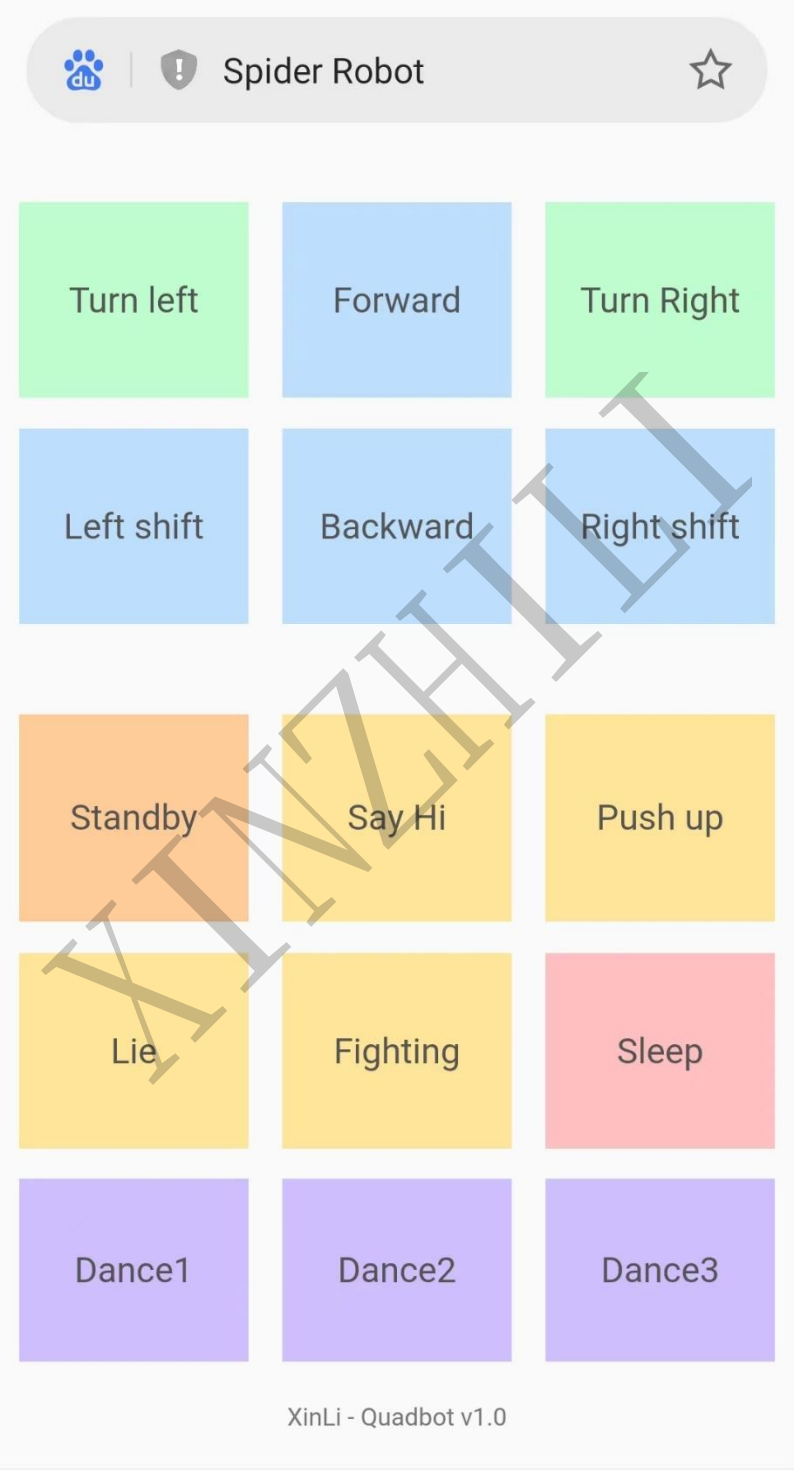
Enter a number in the D16 input box, (it can support both positive and negative, they are represent turn around to positive or negative). Then click the "Setting" button, and switch web to http://192.168.4.1/zero, click D16 and you can see the vision adjusted . By analogy, calibrate the other 7 servo motorss, the final calibration is shown as below picture



3.1.2 Key remote control

Enter the control page address:192.168.4.1in the mobile

phone or computer web browser, and the following interface will appear if it is correct



At this time, you can control the robot according to the text prompts on the page.

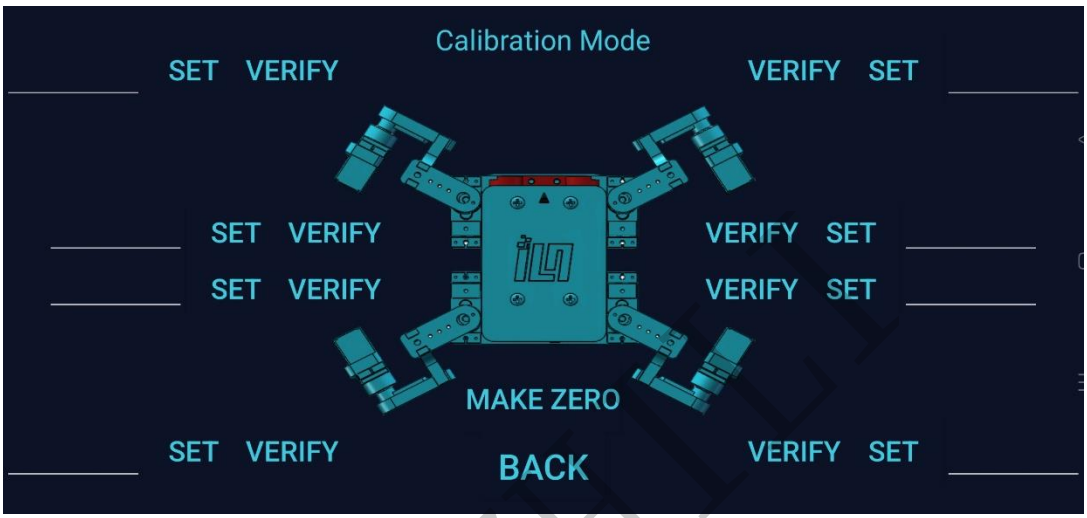
3.2 Control with Android APP

If you need to experience the voice control function, please search and install XunfeiYuJi or iFLYTEK Voice+in the application market, after setting. locate the APP directory in the tutorials and install QuanBot-E.apk. The interface shown as below picture

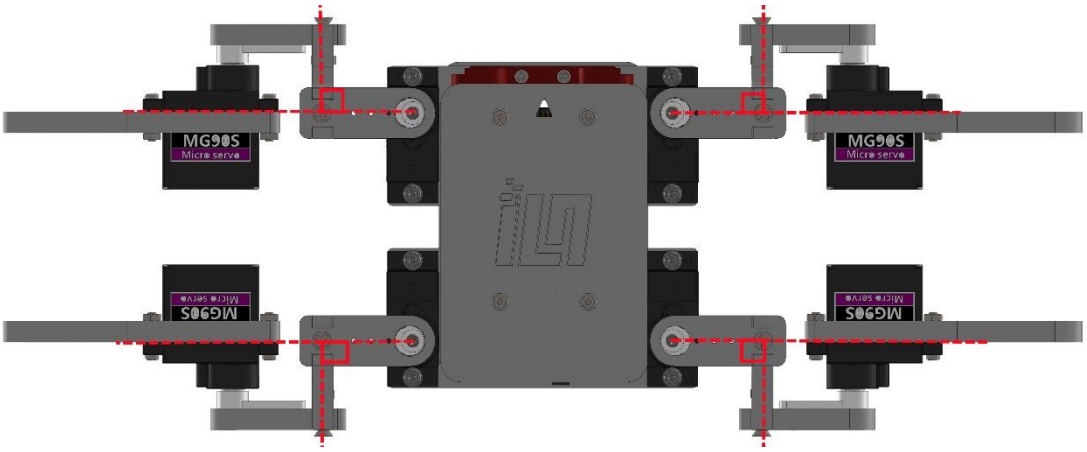
The mobile phone or computer wireless network scans WIFI (turn off shared networks such as GPRS and make sure that WIFI is the only network used), connects the wifi hotspot named “Robot XXX”, and the password is 12345678, shown as below picture→

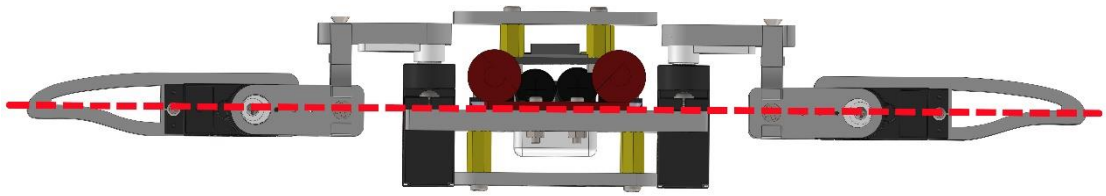
3.2.1 Calibration mode

Click the "Calibration Mode" button on the APP home page to enter the calibration page,



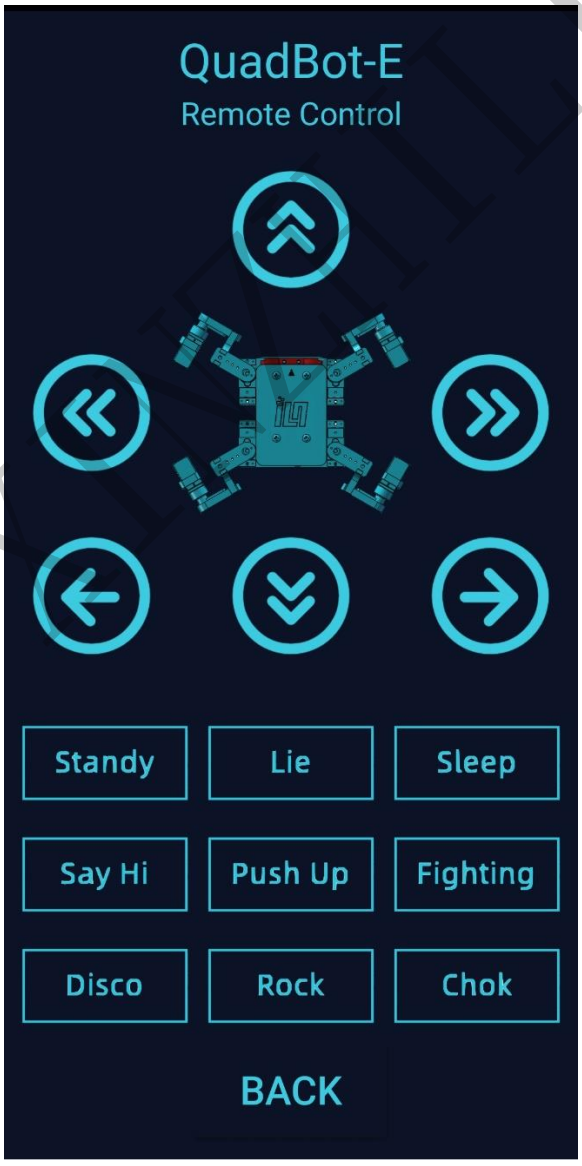
As shown in the figure, enter the calibration value in the horizontal box in front of the setting, which is generally within plus or minus 15. The symbol represents the direction. Then click Set, and then click Verify to see that the corresponding servo will be adjusted. The same action operates each servo until the robot's attitude is as shown below.





3.2.2 Key control mode

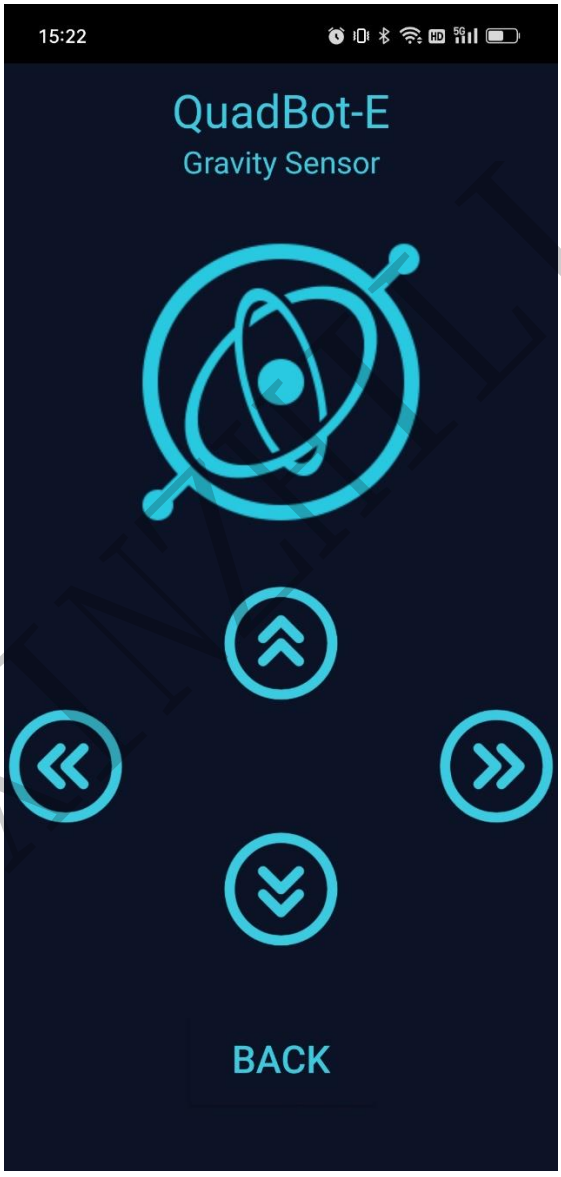
Click the "Key Control" button to enter the key control mode and get the following interface



Then you can control the robot according to the key prompts.

3.2.3 Gyro mode

Enter the homepage, click the "Gravity Control" button to enter the Gyro mode, and get the following interface

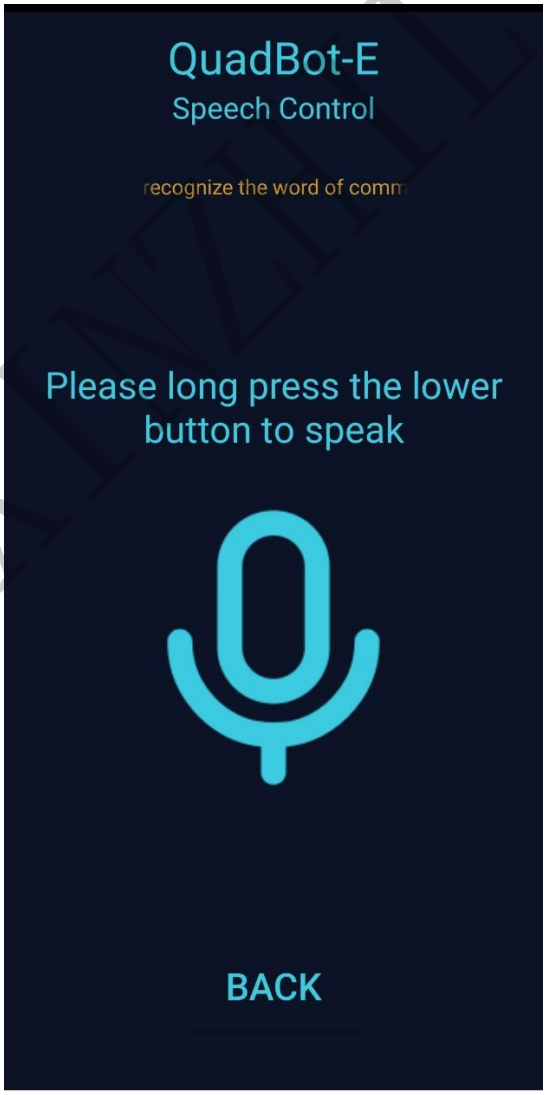


Rotate the mobile phone forward substantially, the robot moves forward; Rotating backward, and the robot backward; The mobile phone rotates to the left and the robot moves to

the left; The mobile phone rotates to the right and the robot moves to the right; Make the mobile phone Lay flat and rotate clockwise, the robot turn right, make the mobile phone Lay flat and rotate anti-clockwise, the robot turn left.

3.2.4 Voice control mode

Press to enter voice control mode. The following interface is obtained



Press the microphone, and speak the word "forward", "backward", "turn left", "turn right" and "standby" to the mobile phone. After releasing the button, the robot will act according to the instructions.

4 Graphic courses

The graphical course need using Mixly graphical programming. For details, please refer the tutorials "Mixly Playing QuadBot-E Quadruped Spider Robot.pdf" in the "Course" and "Graphical Programming"