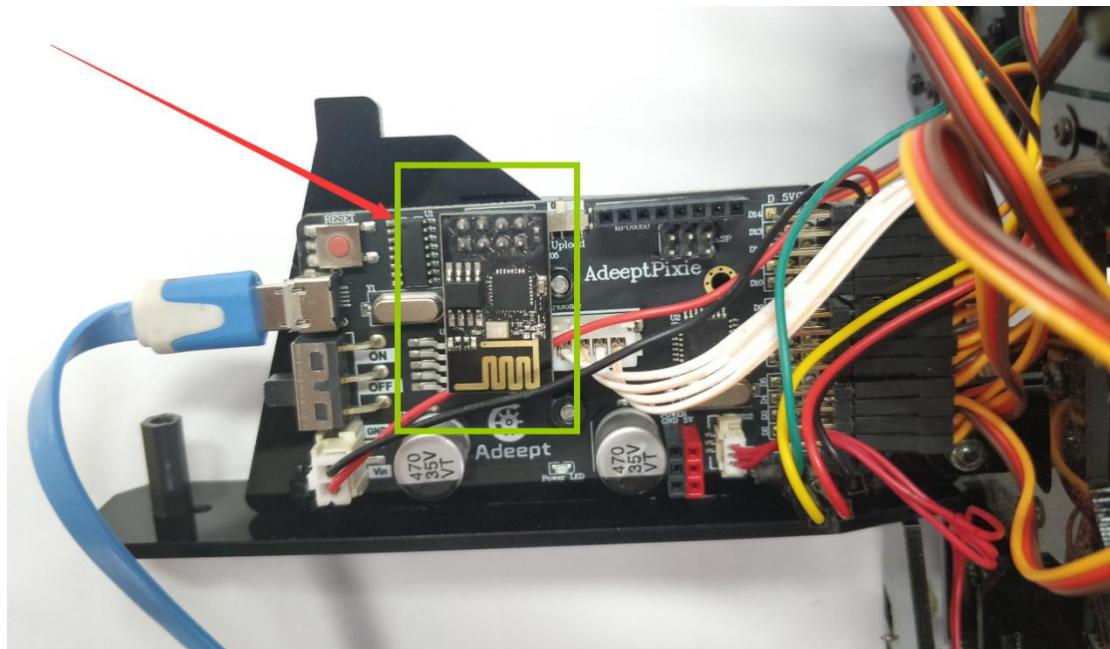


Lesson 12 Remotely Controlling the Robot via GUI

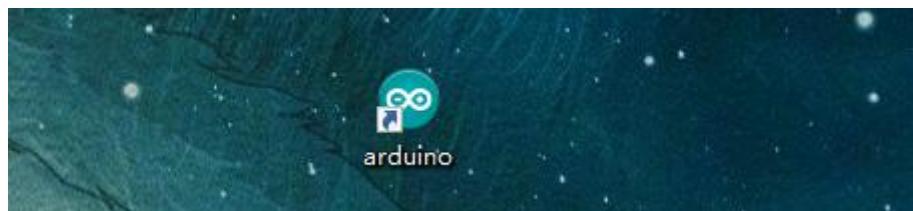
In this lesson, you will learn how to control the movement of the robotic arm with the GUI interface. You need to install Python according to the tutorial in "Lesson 11 Servo Neutral Debugging".

12.1 Setting up WIFI connection

1. You need to connect the ESP8266 module to the wifi interface on the AdeepPixie driver board, as shown in the figure below, and you need to power the robot.

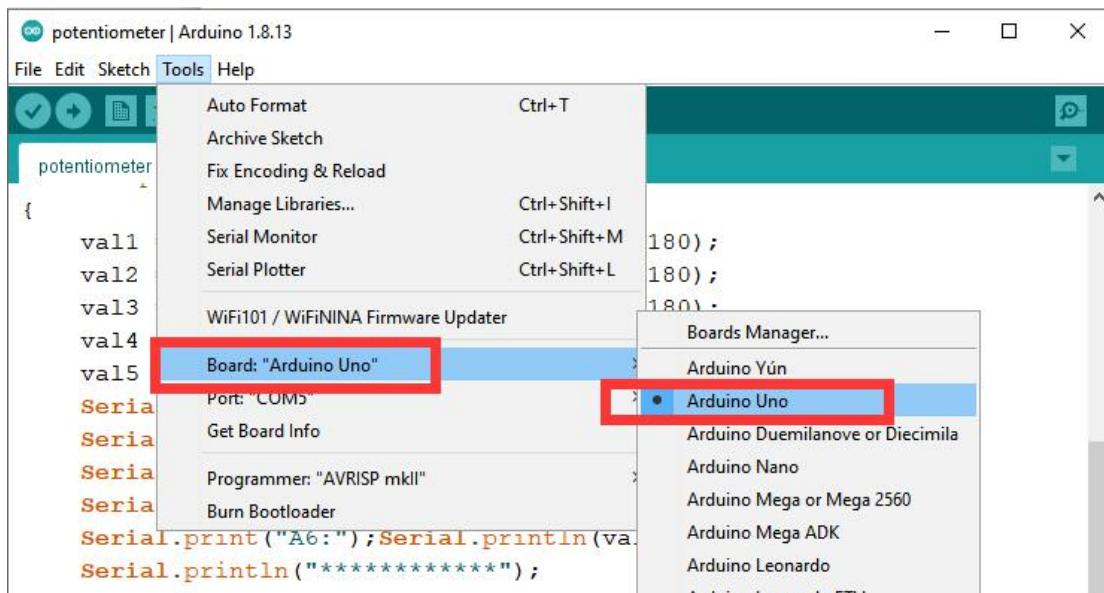


2. First, open the Arduino IDE software, as shown below:

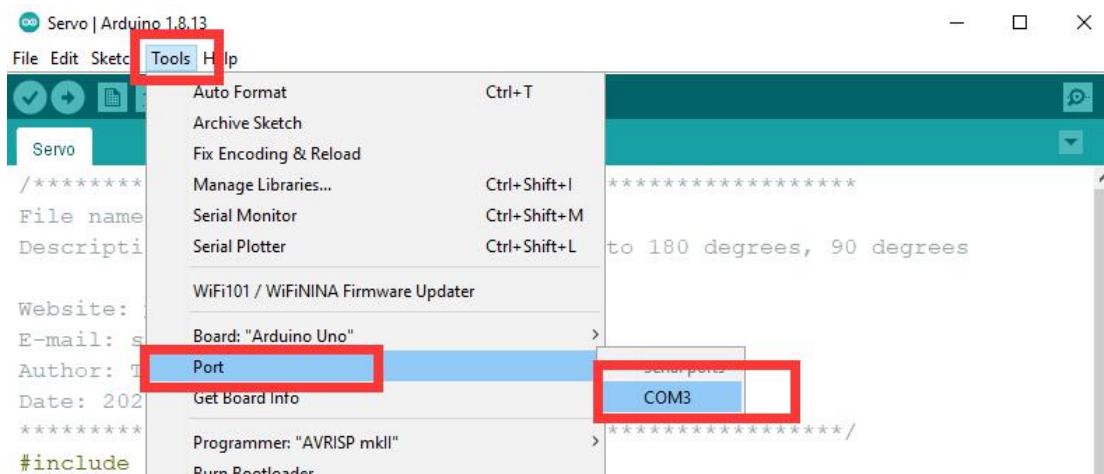


3. In the Tools toolbar, find Board and select Arduino Uno, as shown below:

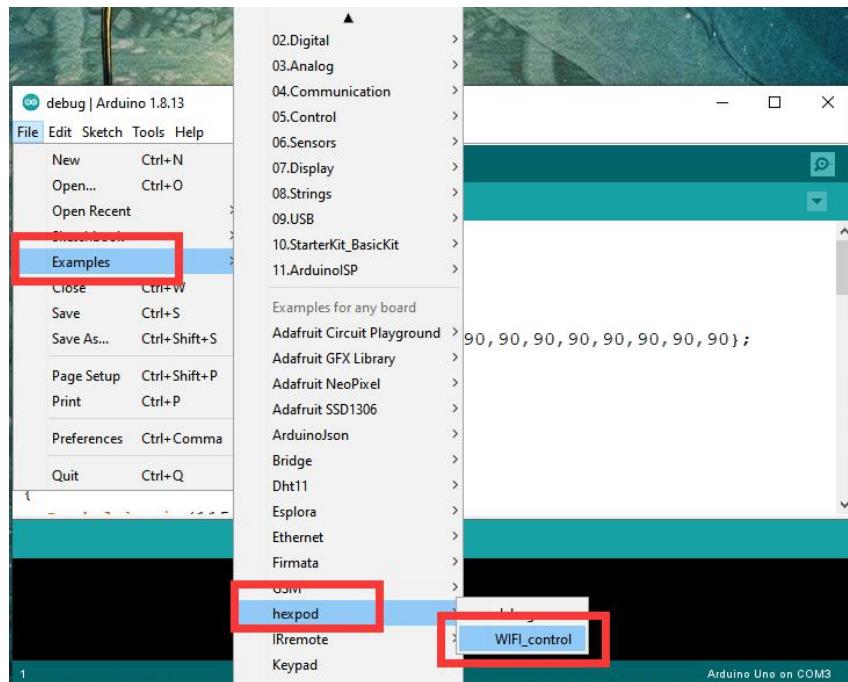
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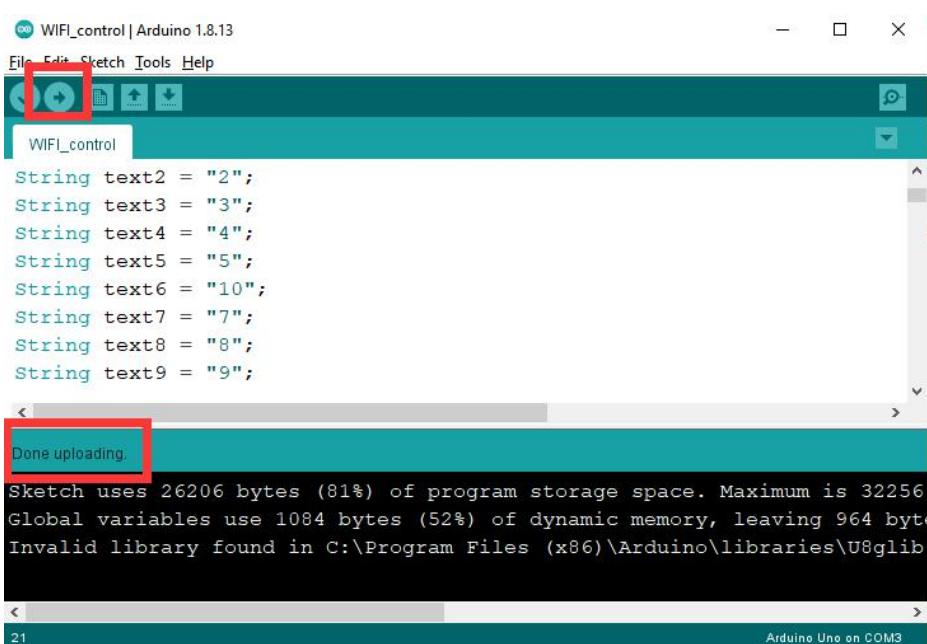
4. Click "Tools" and select the port number of the connected AdeeptPixie Drive Board in "Port", as shown in the figure below:



5. Click Examples->hexpod->WIFI_control under the File drop-down menu:



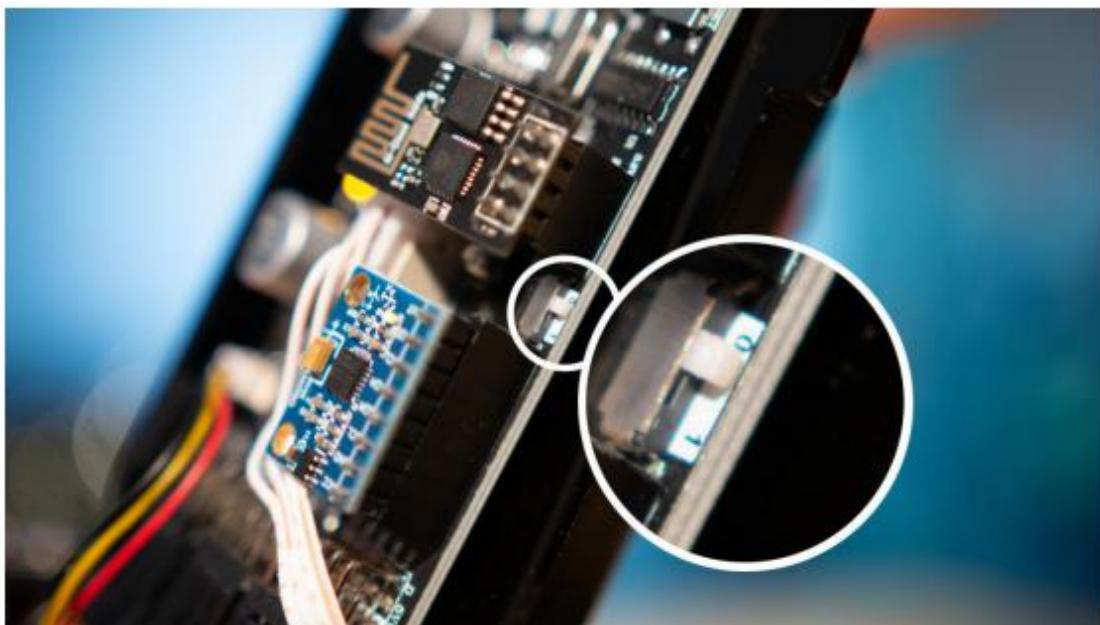
6. Then a WIFI_control program will be opened. Your AdeeptPixie driver board has already installed the ESP8266 module, then you need to turn the "Upload 0 RUN 1" switch on the AdeeptPixie driver board to the 0 position. You need to click  to upload the code program to the driver board. After the upload is successful, a text prompt appears in the lower left corner: Done uploading.



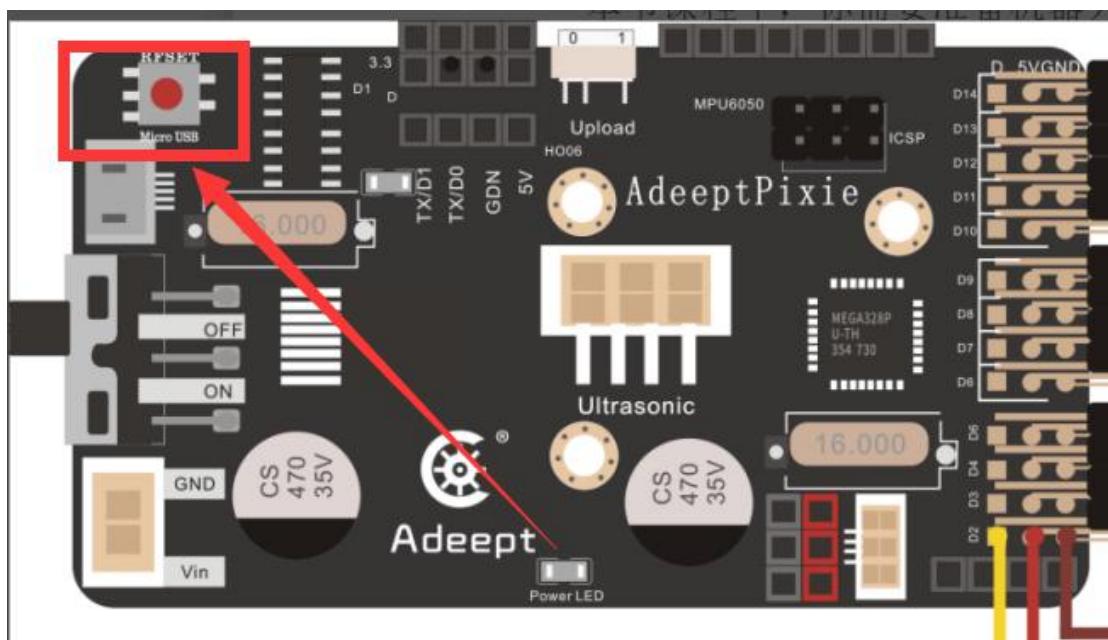
【Pay attention】

If you have already installed the ESP8266 module on your AdeeptPixie driver

board when you proceed to step 5, then you need to flip the "Upload 0 RUN 1" switch on the AdeeptPixie driver board to the 0 position, as shown in the figure below. When you upload the program successfully, you must turn the switch to the 1 position.



Press the reset button again. At this time, the USB cable does not need to be connected to the robot.



(2) If the following error message appears when you upload the "WIFI_control" program, the reason for this error message is that you did not toggle the "Upload 0 RUN 1" switch on the AdeeptPixie driver board before uploading the "WIFI_control"

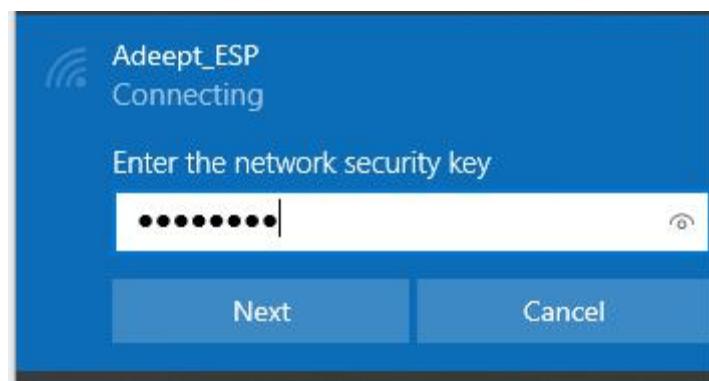
program to the 0 position, so you need to check again whether the "Upload 0 RUN 1" switch is in the 0 position.

```
An error occurred while uploading the sketch
Sketch uses 26206 bytes (81%) of program storage space. Maximum is 32256 bytes.
Global variables use 1084 bytes (52%) of dynamic memory, leaving 964 bytes for local variables
An error occurred while uploading the sketch
avrduude: stk500_getsync() attempt 1 of 10: not in sync: resp=0x41
avrduude: stk500_getsync() attempt 2 of 10: not in sync: resp=0x54
avrduude: stk500_getsync() attempt 3 of 10: not in sync: resp=0x2b
avrduude: stk500_getsync() attempt 4 of 10: not in sync: resp=0x43
avrduude: stk500_getsync() attempt 5 of 10: not in sync: resp=0x57
avrduude: stk500_getsync() attempt 6 of 10: not in sync: resp=0x4d
avrduude: stk500_getsync() attempt 7 of 10: not in sync: resp=0x4f
avrduude: stk500_getsync() attempt 8 of 10: not in sync: resp=0x44
avrduude: stk500_getsync() attempt 9 of 10: not in sync: resp=0x45
avrduude: stk500_getsync() attempt 10 of 10: not in sync: resp=0x3d
Invalid library found in C:\Program Files (x86)\Arduino\libraries\U8glib: no headers files (.h)
Invalid library found in C:\Program Files (x86)\Arduino\libraries\U8glib: no headers files (.h)
```

7. After the upload is successful, the ESP8266 module will generate a Wifi hotspot by default. You can check the name with "ESP" in the WIFI list. This hotspot is generated by ESP8266. In the next section, we will teach you how to connect to this hotspot via GUI.



8. Now you need to connect to the WIFI hotspot generated by the ESP8266 module with your computer. The initial password of this hotspot is 12345678.



【Pay attention】

- If you are using a desktop computer, you need to purchase an additional USB wireless network card device. With this device, the desktop computer can be connected to the WIFI hotspot of the ESP8266 module.

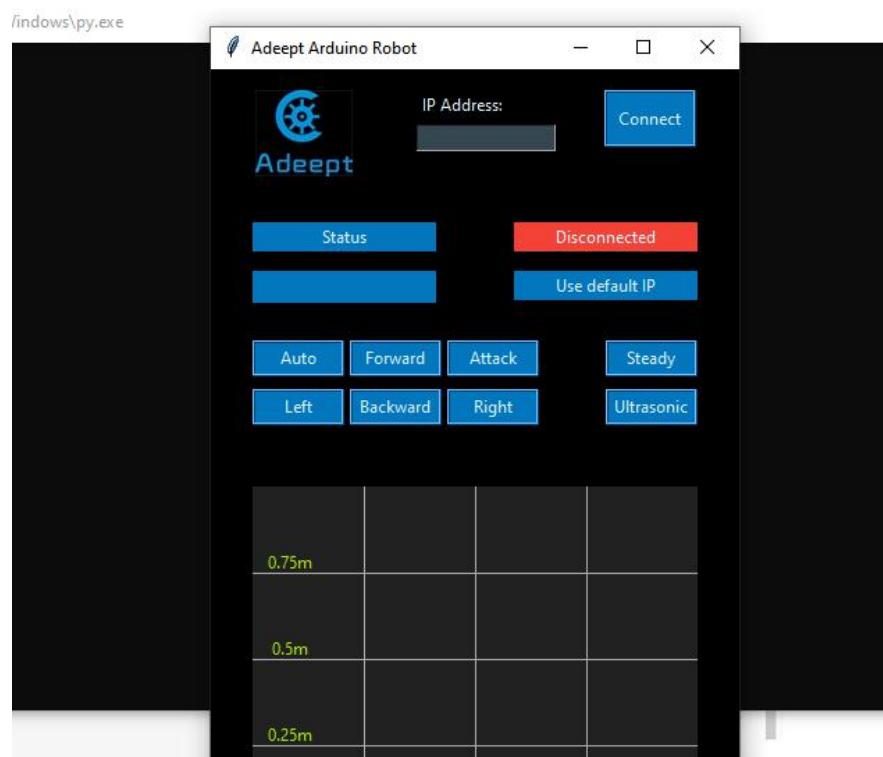
2. When the robot is turned on, the light above its head is white; when you connect to its WIFI hotspot, the light above its head changes to blue;

12.2 Connecting the robot wirelessly via GUI

1. Find the folder Hexapod 6 Legs Spider Robot Kit for Arduino\02Software installation package we provide for users, open the Arduino GUI folder, double-click to open the "GUI info v1.0.py" program (You must have the Python running environment installed on your computer before you can open it).

Name	Date modified	Type	Size
GUI info v1.0.py	8/25/2020 10:29 AM	Python File	14 KB
WIFI	8/25/2020 10:29 AM	Text Document	1 KB
logo.png	8/25/2020 10:29 AM	PNG 图片文件	8 KB

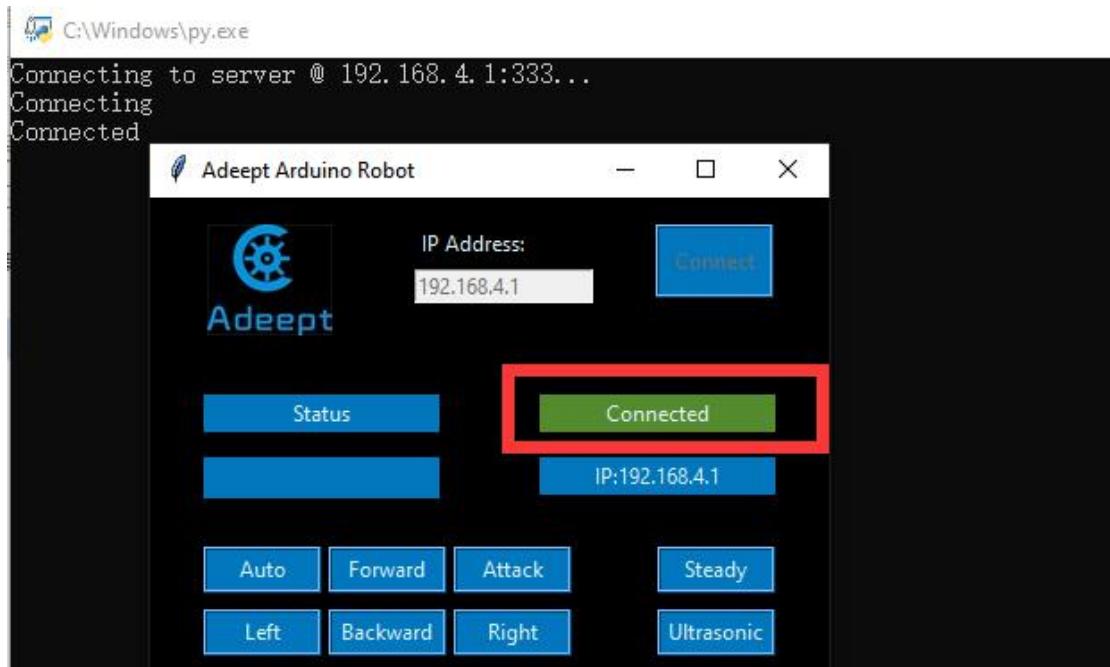
2. The GUI interface after opening is as follows:



3. You need to enter the default IP address of the ESP8266 module in the "IP Address" input field: 192.168.4.1, this IP address is universal in the world, and it is

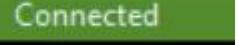
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generated by the ESP8266 module by default. Click the Connect button, after the connection is successful, the interface will display a green "Connect button".



【Pay attention】

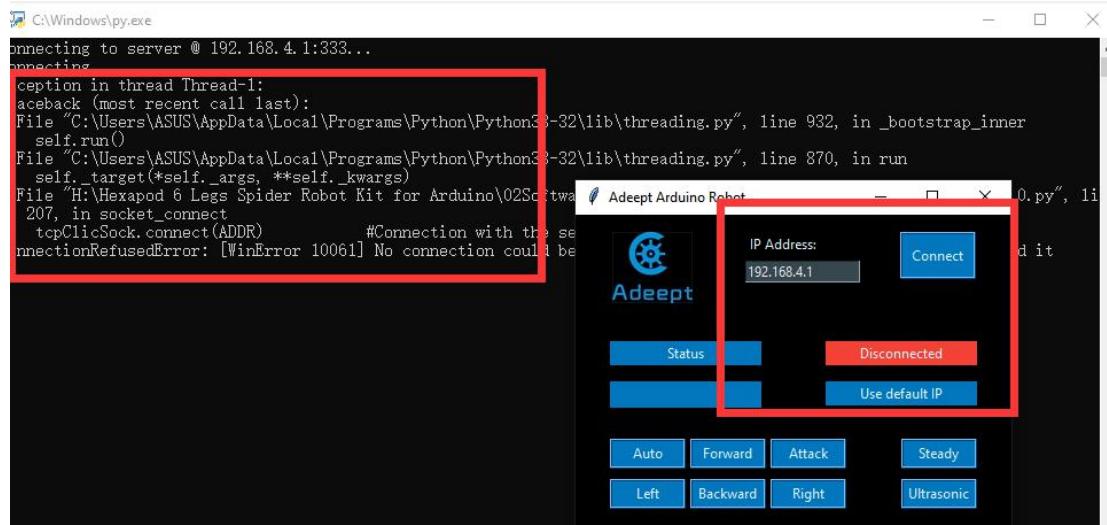
1. When performing this step, you need to make sure whether your computer has been connected to the WIFI hotspot of the ESP8266 module according to step 8 of 12.1.

2. After clicking the Connect button, there may be the following reminder that the connection cannot be made, and the button  does not turn into a green  button. We provide some solutions for your reference:

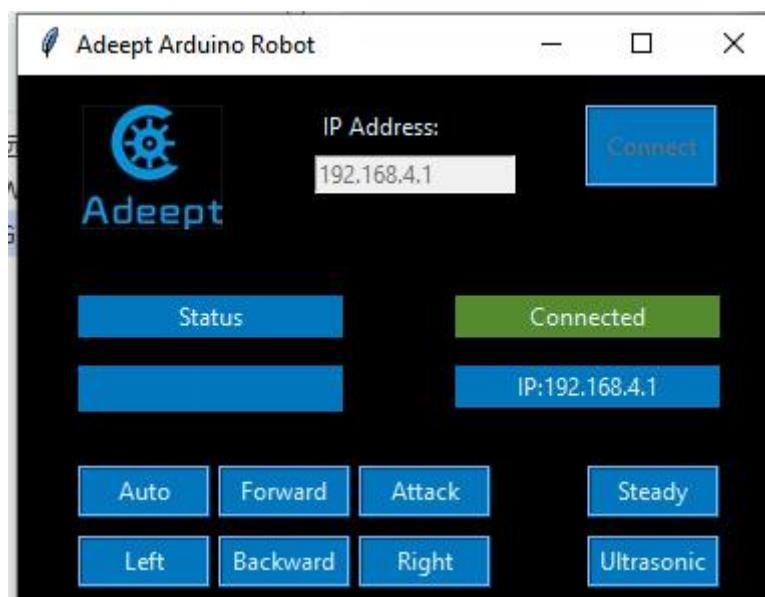
(1) First, you need to check whether the computer is connected to the WIFI hotspot of the ESP8266 module.

(2) In accordance with the operation steps of Section 12.1, have you turned the "Upload 0 RUN 1" switch on the AdeepPixie driver board to the 0 position when uploading the WIFI_control program, when you upload the program successfully, you must turn the switch to the 1 position, and then press the reset button to restart the robot. At this time, you reconnect the WIFI hotspot of the ESP8266 module, and then connect to the robot with the GUI application, and repeat the steps in 12.2.

(3) There is another situation. It may be that your robot's battery is insufficient and it will not be able to connect. You need to replace the battery with a sufficient battery to the robot, and then follow the steps in 12.1 and 12.2.



12.3 Introduction to the functions of GUI application interface



12.3.1 Controlling the robot by clicking the buttons on the GUI interface

【note】

When manipulating the robot, turn the "Upload 0 RUN 1" switch on the AdeeptPixie drive board to the 1 position.

【1】 :

This button can control the robot to move forward. At the same time, the overhead lights will change the corresponding colors.

【2】 :

This button can control the robot to go back.

【3】 :

This button can control the robot to turn left.

【4】 :

This button can control the robot to turn right.

【5】 :

This button can control the robot to start the attack mode.

【6】 :

This button can control the robot to start the self-stabilization mode. In this mode, if the power of the robot is insufficient, you may not be able to observe the phenomenon. You need to manually hold the robot in the air and be careful not to let its legs hurt you.

1. Note that when in self-stabilizing state, large range of motions is not recommended, and the angle of inclination is best not to exceed 30 degrees. Otherwise the processor will misjudge, resulting in incorrect data, if the processor misjudge,

don't worry about it , the processor can correct itself and return to normal

2.During the self-stabilization, if too large motion is exerted or it meets unexpected conditions, restart the robot.

【7】 : Ultrasonic

This button can control the robot to enter the automatic detection obstacle distance mode. When you click this button, the position and distance of the obstacle detected by the robot scanning will appear in the similar coordinate position below the GUI interface.

【Pay attention】

If the position and distance of the obstacle detected by the scan does not appear, it is recommended that you restart the robot. Establish the connection again.



Print out the distance in another command window:

```

C:\Windows\py.exe
14
15
20
22
25
24
20
19
21
26
23

```



This button can control the robot to start the automatic obstacle avoidance mode. If an obstacle is detected, the robot will automatically steer to avoid the obstacle.

【Invalid button】



is invalid buttons. It cannot control the robot and will not affect the use of the robot.

12.3.2 Controlling the robot by keyboard keys

When you open the GUI application interface, click the mouse on the GUI interface. Under the English input method, you can control the robot movement by pressing the letter direction keys W, S, A, D on the keyboard. W—forward, S—backward, A—turn left, D—turn right. Press different buttons, the lights on the robot head will change to different colors.

1. When you press the X button, the robot enters the automatic obstacle detection mode.
2. When you press the F button, the robot enters the self-stabilization mode.
3. When you press the E button, the robot enters the attack mode. At this time, when an object is close to the front of the robot, the robot detects that there is an object close, and it will switch to an attacking posture; when the object is far away from the robot, the robot resumes its standing state.
4. When you press the Q button, the robot enters the automatic obstacle avoidance mode. If an obstacle is detected, the robot will automatically steer to avoid the obstacle.