

2.3 Software Setting

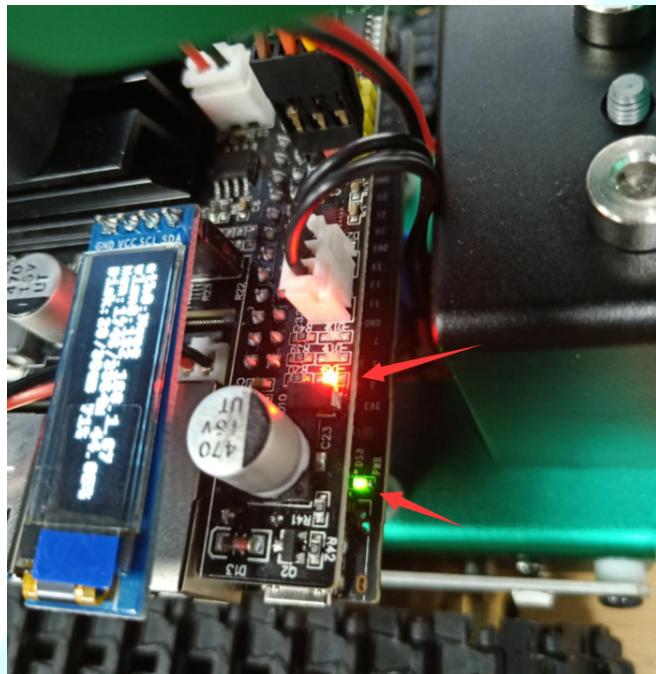
1. Connecting to Jetbot by headless (head-free) mode

In this mode, your Jetson Nano Developer Kit connects directly to your computer via a USB cable. No need network connection on the Jetbot and the need to determine the IP address on the network.

It is always in this mode 192.168.55.1:8888. This means you can't connect your monitor directly to the Jetson Nano Developer Kit. This approach saves memory resources on the Jetson Nano and eliminates the need for additional hardware (monitors, keyboards, and mice).

Steps of headless mode

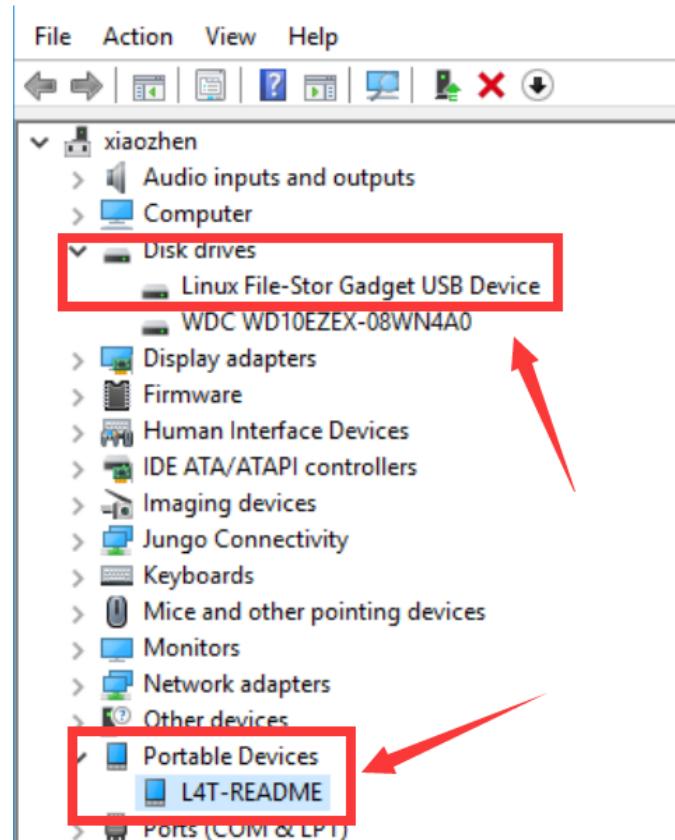
- ① You need to open the power switch of robot car. You will see the cooling fan will rotate, and you will see some LED light on the Jetson NANO or expansion board, as shown below.



- ② Connect robot car to your computer by USB cable, as shown below.



③Wait patiently for a while. After the system is successfully booted, the PC will appear with the following device and a drive for communication between the two parties - **Linux File-Stor Gadget USB Device**.

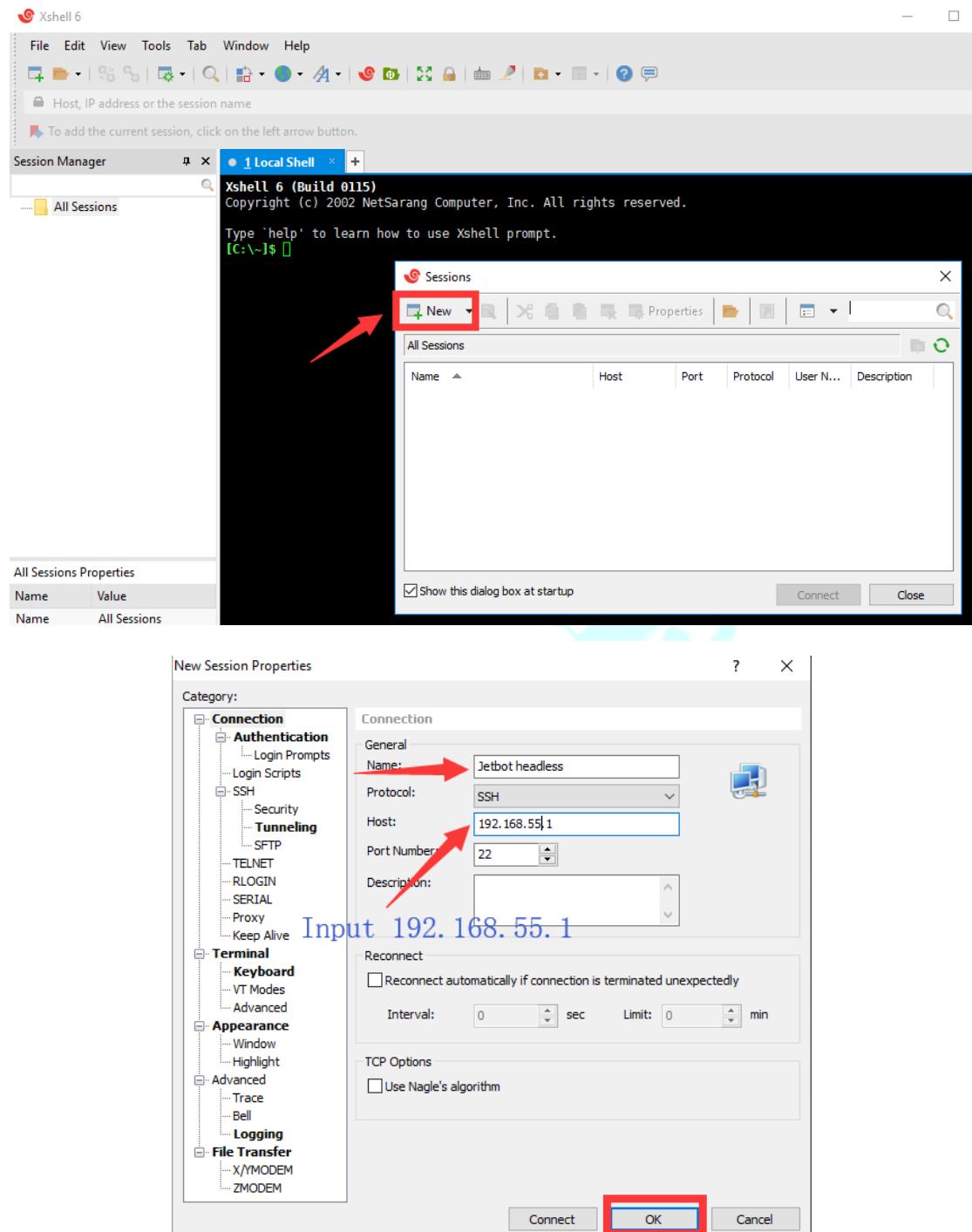


Note: You must first turn on the power switch of car, then connect to your computer by USB cable.

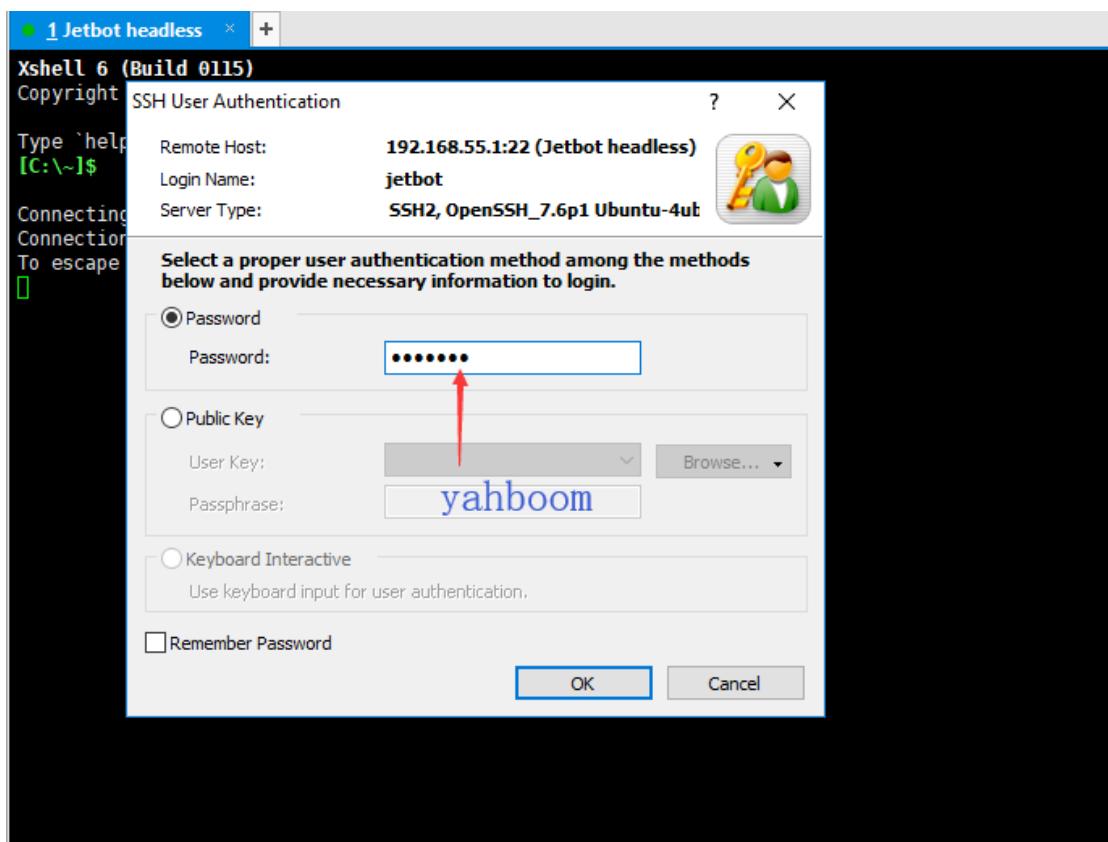
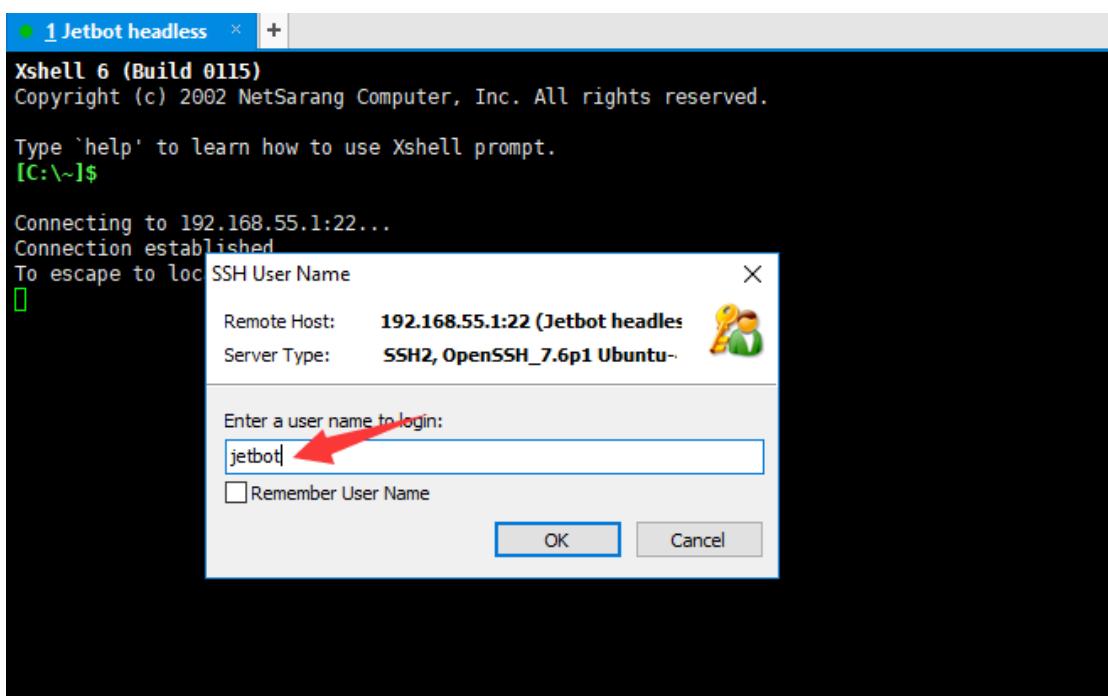
After the above device appears on the PC, we can connect to Jetbot through Xshell/Putty without connecting to the network. The host number is fixed IP address **192.168.55.1**.

You can log in normally by entering the corresponding username and password of Jetbot.

As shown below(by Xshell):



**User name :jetbot
Password: yahboom**



```
Xshell 6 (Build 0115)
Copyright (c) 2002 NetSarang Computer, Inc. All rights reserved.

Type `help' to learn how to use Xshell prompt.
[D:\~]$ 

Connecting to 192.168.1.67:22...
Connection established.
To escape to local shell, press 'Ctrl+Alt+]'.

Welcome to Ubuntu 18.04.2 LTS (GNU/Linux 4.9.140-tegra aarch64)

 * Documentation: https://help.ubuntu.com
 * Management: https://landscape.canonical.com
 * Support: https://ubuntu.com/advantage

This system has been minimized by removing packages and content that are
not required on a system that users do not log into.

To restore this content, you can run the 'unminimize' command.

0 个可升级软件包。
0 个安全更新。

Last login: Tue Sep  3 11:04:52 2019 from 192.168.1.132
jetbot@jetbot:~$ |
```

2. Jetbot connect WIFI

2.1 Method 1:

Connect to the PC using the "headless mode" to configure the connection by command line.

Follow the steps to connect Jetbot to the WIFI network using the following command:

```
nmcli dev wifi
```

IN-USE	SSID	MODE	CHAN	RATE	SIGNAL	BARS	SECURITY
	Yahboom1_2.4G	红外	11	270 Mbit/s	100	██████	WPA1 WPA2
	Yahboom_warehouse	红外	11	405 Mbit/s	89	██████	WPA1 WPA2
	TPGuest_2101	红外	11	405 Mbit/s	87	██████	WPA1 WPA2
	Yahboom1_5G	红外	161	270 Mbit/s	70	██████	WPA1 WPA2
	Yahboom_WIFI	红外	2	65 Mbit/s	69	██████	--
	Yahboom	红外	1	405 Mbit/s	64	██████	WPA1 WPA2
	ChinaNet-jDzS	红外	1	270 Mbit/s	64	██████	WPA1 WPA2
	XXX	红外	1	130 Mbit/s	64	██████	WPA2
	dct	红外	11	195 Mbit/s	64	██████	WPA1 WPA2
	ChinaNet-mjSn	红外	5	130 Mbit/s	62	██████	WPA1 WPA2
	ChinaNet-pcJz	红外	9	130 Mbit/s	62	██████	WPA1 WPA2
	Yahboom_warehouse	红外	161	405 Mbit/s	62	██████	WPA1 WPA2
	--	红外	6	270 Mbit/s	59	██████	WPA2
	DIRECT-05-HP DeskJet 2600 series	红外	11	65 Mbit/s	59	██████	WPA2
	--	红外	4	130 Mbit/s	57	██████	WPA1 WPA2
	hahahahah	红外	153	405 Mbit/s	57	██████	WPA1 WPA2
	Xiaomi_9EE1	红外	8	130 Mbit/s	52	██████	WPA1 WPA2
	hahahahah	红外	6	405 Mbit/s	50	██████	WPA1 WPA2
	MERCURY_8D1C	红外	6	270 Mbit/s	50	██████	WPA1 WPA2
	空白	红外	1	270 Mbit/s	49	██████	WPA2
	ChinaNet-dct	红外	1	130 Mbit/s	49	██████	WPA1 WPA2
	--	红外	6	270 Mbit/s	49	██████	WPA2
	406-5G	红外	36	270 Mbit/s	47	██████	WPA1 WPA2
	Piano	红外	157	270 Mbit/s	47	██████	WPA2
	--	红外	1	270 Mbit/s	45	██████	WPA2
	FAST_6AFC08	红外	1	135 Mbit/s	45	██████	WPA1 WPA2
	HUAWEI mate20_5G	红外	1	270 Mbit/s	44	██████	WPA1 WPA2
	704	红外	1	135 Mbit/s	44	██████	WPA1 WPA2
	ChinaNet-SFcY	红外	1	130 Mbit/s	44	██████	WPA1 WPA2
	JUYIYING	红外	6	270 Mbit/s	44	██████	WPA2
	Yahboom5G	红外	149	405 Mbit/s	44	██████	WPA1 WPA2
	REX	红外	1	270 Mbit/s	42	██████	WPA1 WPA2
	TP-LINK_CC58	红外	149	270 Mbit/s	42	██████	WPA1 WPA2
	5016	红外	1	270 Mbit/s	40	██████	WPA1 WPA2
	--	红外	9	270 Mbit/s	37	██████	WPA2

Yahboom

Input following command to connect WIFI:

```
sudo nmcli dev wifi connect wifi_name password 12345678
```

```
[sudo] jetbot 的密码:  
成功用 'wlan0' 激活了设备 '612a9c73-8e52-4be7-86ea-c237b7d6e4c9'。  
jetbot@jetbot:~$
```

Yahboom

View the IP address after connecting to WIFI:

```
ifconfig
```

```
lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536  
    inet 127.0.0.1 netmask 255.0.0.0  
        inet6 ::1 prefixlen 128 scopeid 0x10<host>  
        loop txqueuelen 1  
        RX packets 419 bytes 29517 (29.5 KB)  
        RX errors 0 dropped 0 overruns 0 frame 0  
        TX packets 419 bytes 29517 (29.5 KB)  
        TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0  
  
rndis0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500  
    inet6 fe80::6f:73ff:fe5b:6ad5 prefixlen 64 scopeid 0x20<link>  
    ether 02:6f:73:5b:64:d5 txqueuelen 1000  
    RX packets 739 bytes 66313 (66.3 KB)  
    RX errors 0 dropped 4 overruns 0 frame 0  
    TX packets 276 bytes 57729 (57.7 KB)  
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0  
  
usb0: flags=4099<UP,BROADCAST,MULTICAST> mtu 1500  
    ether 02:6f:73:5b:64:d7 txqueuelen 1000  
    RX packets 0 bytes 0 (0.0 B)  
    RX errors 0 dropped 0 overruns 0 frame 0  
    TX packets 0 bytes 0 (0.0 B)  
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0  
  
wlan0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500  
    inet 192.168.1.196 brd 255.255.255.0 broadcast 192.168.1.255  
        inet6 fe80::f313:5280:109f:6f4d prefixlen 64 scopeid 0x20<link>  
        ether 34:13:e8:62:93:78 txqueuelen 1000  
        RX packets 2132 bytes 522738 (522.7 KB)  
        RX errors 0 dropped 0 overruns 0 frame 0  
        TX packets 396 bytes 89275 (89.2 KB)  
        TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0  
jetbot@jetbot:~$
```

IP address

Yahboom

Connect Jetbot by new IP address, Input the command on the PC to control it.:

```
ssh -p 22 jetbot@192.168.1.196
```

```
jetbot@jetbot:~$ ssh -p 22 jetbot@192.168.1.196  
The authenticity of host '192.168.1.196 (192.168.1.196)' can't be established.  
ECDSA key fingerprint is SHA256:f7YjHYsivWYKx+/YSzBP3MPeunhVVJZWGxHosxlhRU4.  
Are you sure you want to continue connecting (yes/no)? yes  
Warning: Permanently added '192.168.1.196' (ECDSA) to the list of known hosts.  
jetbot@192.168.1.196's password:  
Welcome to Ubuntu 18.04.2 LTS (GNU/Linux 4.9.140-tegra aarch64)
```

- * Documentation: <https://help.ubuntu.com>
- * Management: <https://landscape.canonical.com>
- * Support: <https://ubuntu.com/advantage>

This system has been minimized by removing packages and content that are not required on a system that users do not log into.

To restore this content, you can run the 'unminimize' command.

0 个可升级软件包。
0 个安全更新。

```
Last login: Tue Sep 17 11:51:57 2019 from 192.168.55.100  
jetbot@jetbot:~$ |
```

Yahboom

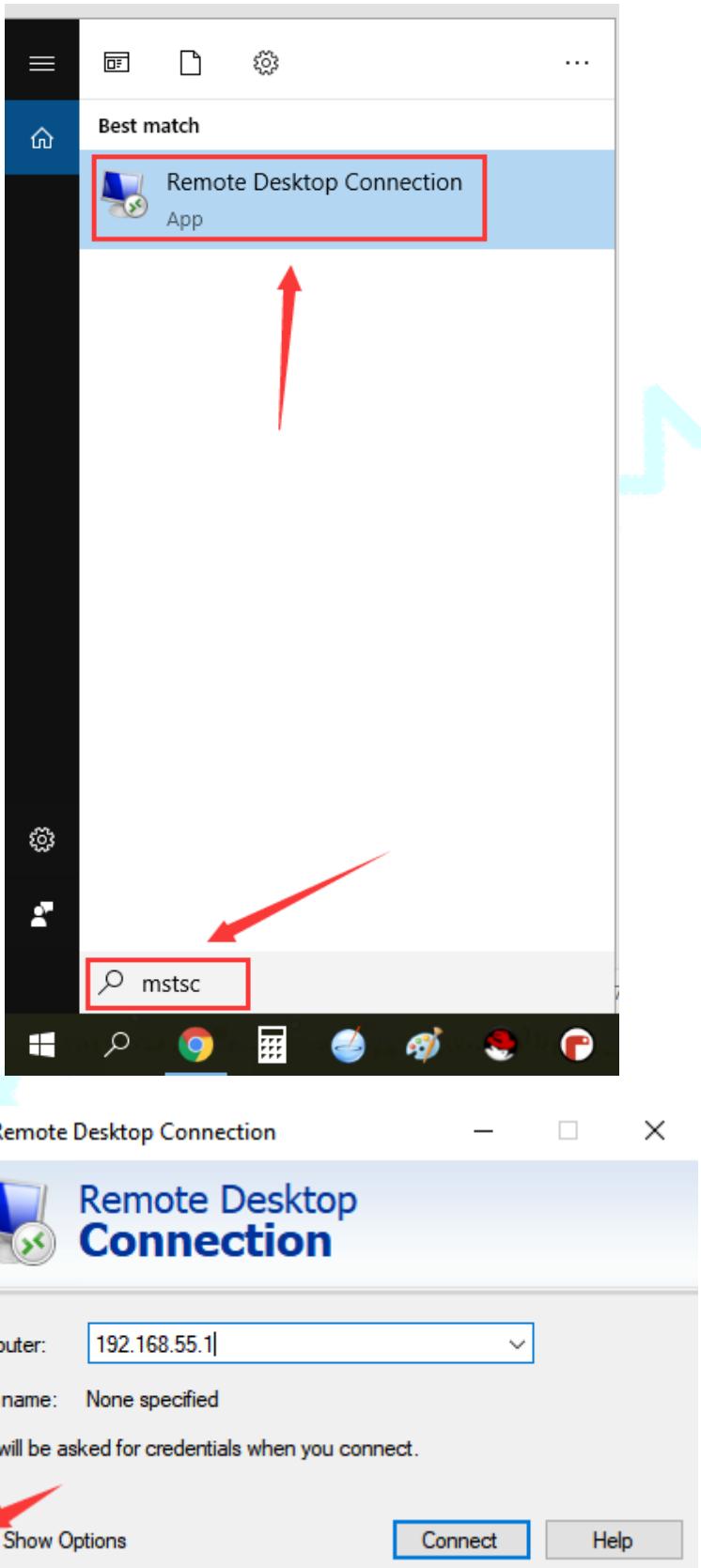
2.2 Method 2:

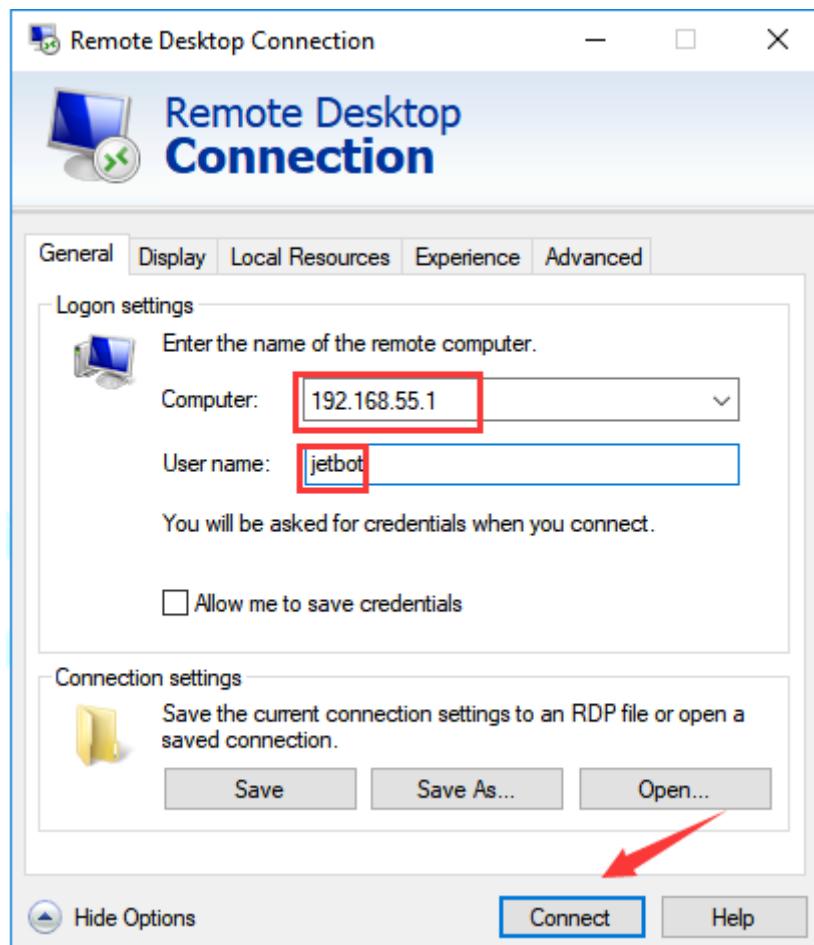
Connect Jetbot to the HDMI screen and configure it on the graphical interface using the mouse and keyboard.

2.3 Method 3:

Use Windows to log in to Remote Desktop/VNC Remote Desktop

- 1) We can connect PC by “headless mode” and find the remote login application in the PC.





2) Then, click "connect".

After a successful connection, we can see the interface shown below.



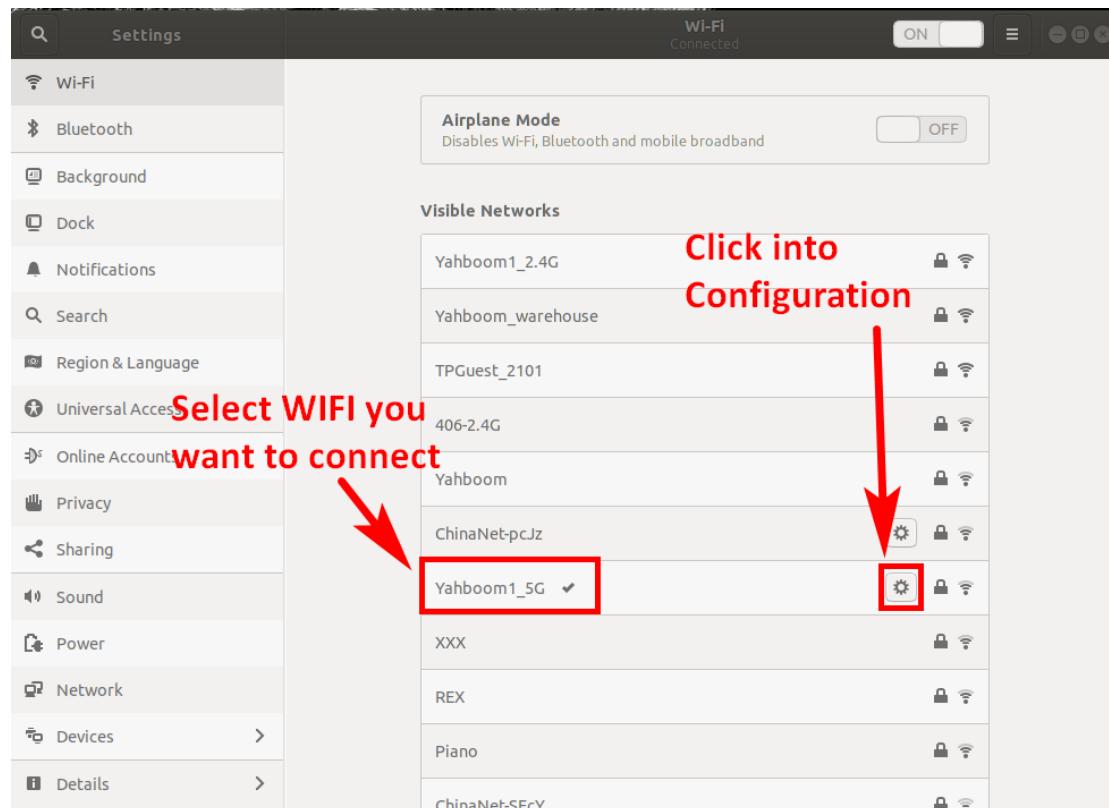
Because it is a third-party desktop, you need to enter a password when

operating key information such as wifi configuration.

3) After entering the password, we can go to the wifi icon in the upper right corner to configure the wifi.

Set static IP:

Enter the connected wifi to setting:



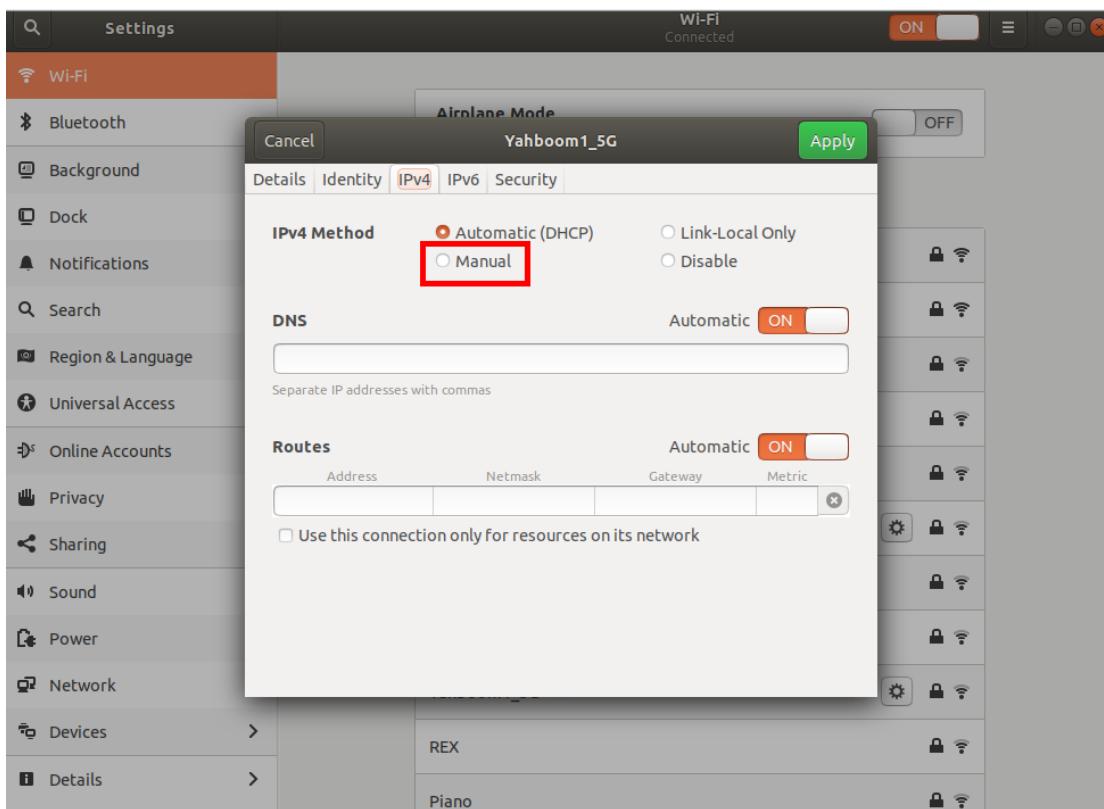
4) Set the IP address you need to set.

!Note: This IP address should not be occupied by other devices.

5) Enter the subnet mask, the default is 255.255.255.0.

6) Enter the gateway, which is usually 192.168.1.1.

The above gateway and subnet mask are subject to your actual network environment, and only the reference is provided above.



2.4 Update software package

Input this command to update software source:

sudo apt-get update

Input this command to update software package installed:

sudo apt-get full-upgrade

2.5 Configuring power mode

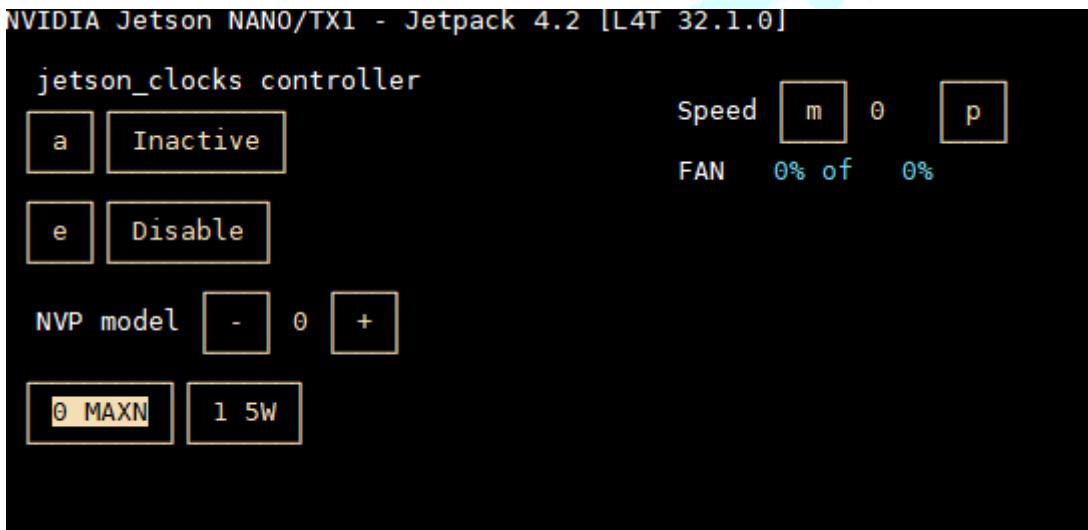
Jetbot has two power modes: 5W mode and MAXN mode.

We can see the current power mode in Jtop by the section 2.1:

The current power mode can be seen in the second interface --- GPU.



Or you can see the current power mode in the third interface -- CTRL.



The biggest difference between the two power modes is:

When in the m0-MAXN mode, the four cores CPU1, CPU2, CPU3, and CPU4 are all turned on; (**High-Performance mode**)

When in the m1-5W mode, only CPU1 and CPU2 of the four core CPU1, CPU2, CPU3, and CPU4 will run, and CPU3 and CPU4 will sleep. At this time, only the CPU performs data processing. (**Low power consumption mode**)

So when it is in 5W power mode, it will be much slower than m0-MAXN mode. If you don't pursue long battery life, it is recommended to use MAXN mode to enjoy the high performance brought by Jetbot.

We can also use the following command line to view the current power consumption mode.

`sudo nvpmode -q`

```
jetbot@jetbot:~$ sudo nvpmodel -q  
[sudo] jetbot 的密码:  
NV Power Mode: MAXN  
0  
jetbot@jetbot:~$ █
```

Input this command to switch mo-MAXN mode:

sudo nvpmodel -m0

Input this command to switch m1-5W mode:

sudo nvpmodel -m1

(Especially when we train the AI model, switching to high performance mode can improve computing performance.)