Raspberry Pi two degrees of freedom camera use tutorial

1.You need to connect camera to Raspberry Pi board.

2.You must to install a new operating system before use camera, which can can identify if the camera module is connected. The simplest method is download Raspbain system from Raspberry Pi website, and install it to new SD card.

Regardless of the version of the Raspbian system you are using, I recommend that you update the system with the following command:

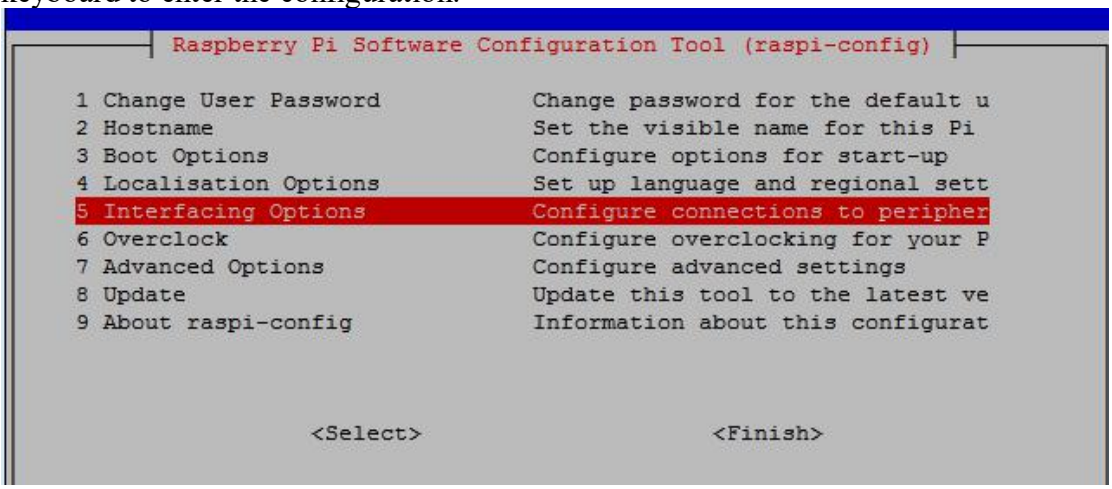
sudo apt-get update

sudo apt-get upgrade

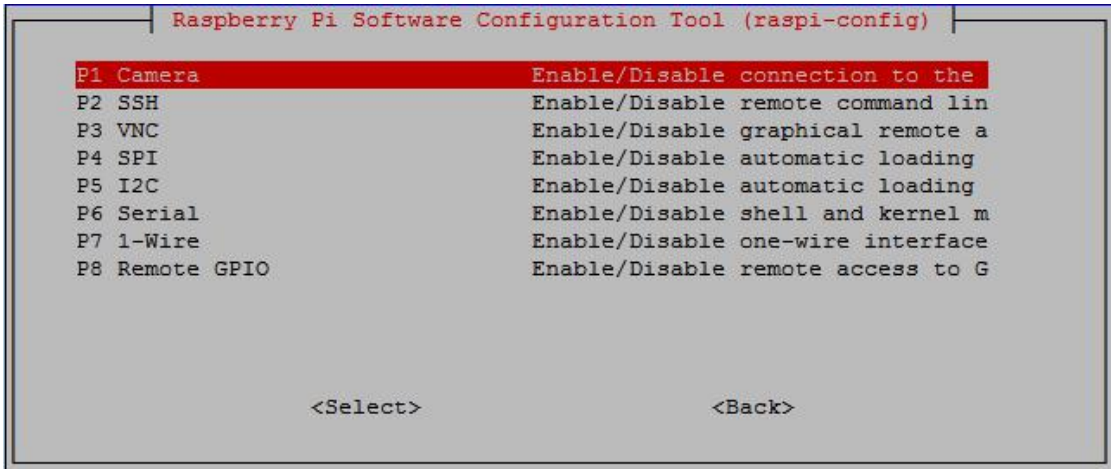
3.Enable camera options

3.1)You need to input: **sudo raspi-config** to enter the following interface:

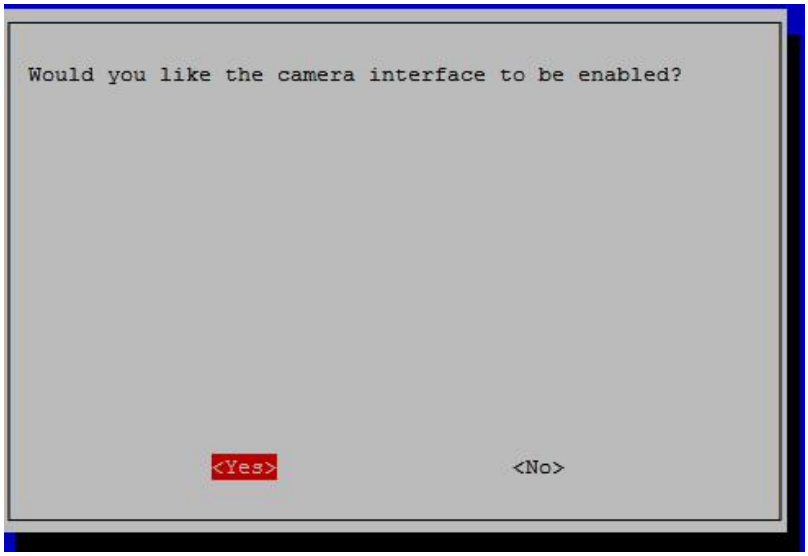
3.2)You need to choose “Interfacing Options”, press the “Enter” key of your keyboard to enter the configuration.



3.3)You need to choose “P1 Camera”, press the “Enter” key of your keyboard to start camera functions.



3.4) You need to choose “Yes”.



After the above steps, the camera function of Raspberry Pi has been turned on.

4.Use camera

You can transfer the video which captured by the Raspberry Pi to the web page.

4.1) You need to log into Raspberry Pi system and give home folder permissions to copy drive folders to this directory. This operation can only be performed by root users.

4.2) You should input: #su

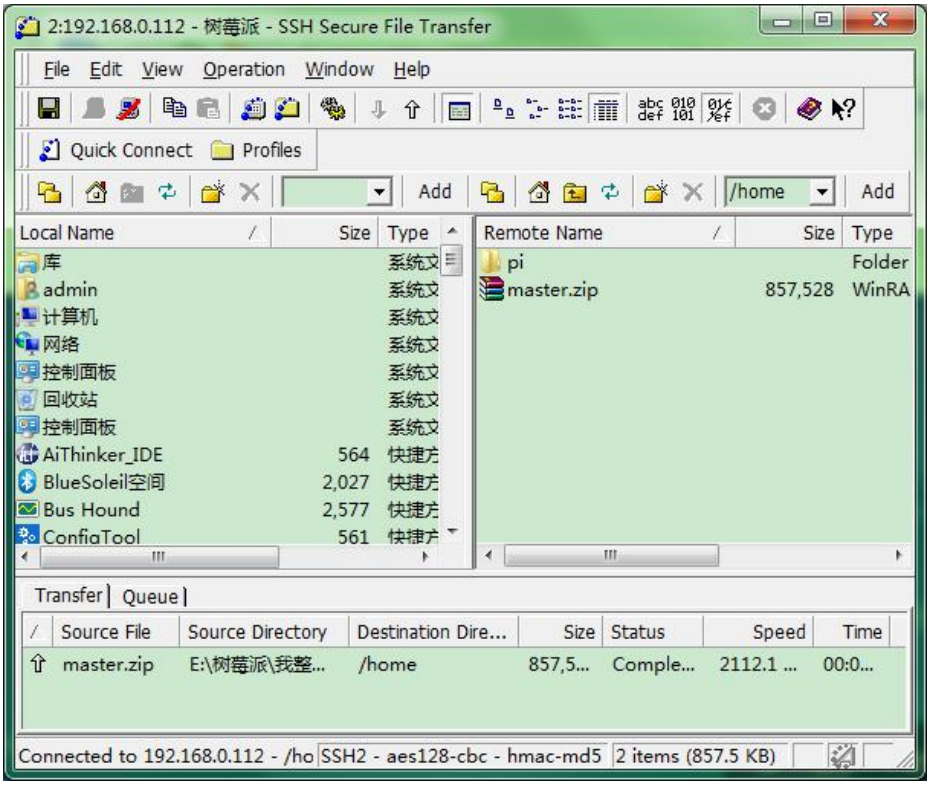
(This command to make you enter root user)

4.3) Then input your password of root permissions

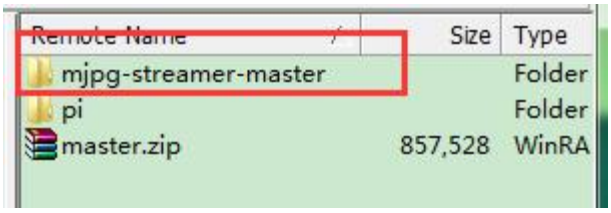
4.4) You should input: #chmod 777 /home

(This command to give home folder permissions to RWX.)

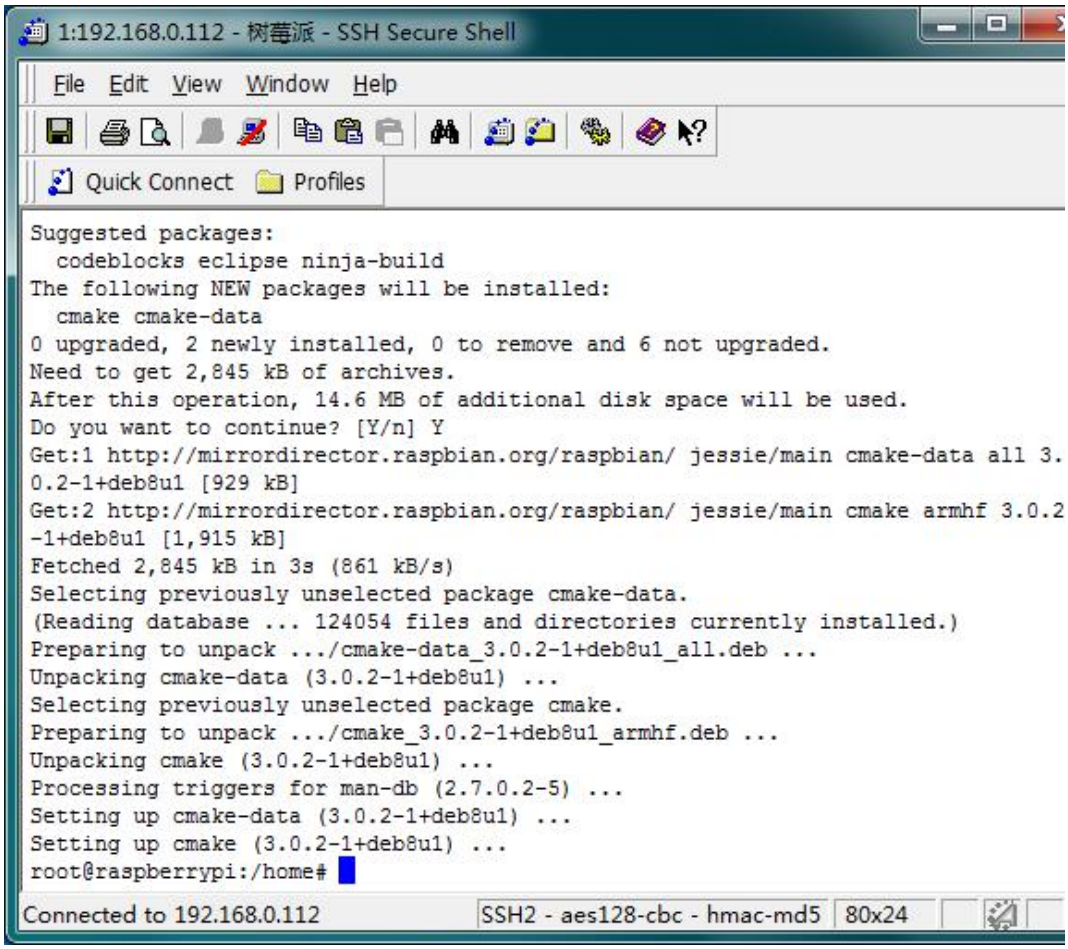
4.5) You need to copy **"master.zip"** to home directory. As shown in the figure below.



4.6) You should input: #unzip master.zip
(This command to unzip mater.zip)
After complete unzip, you can see **migp-streamer-master** folder. As shown in the figure below.



4.7) Compiling this project requires cmake: perform the following command to install download.
(apt-get is a networked installation, so you need make Raspberry Pi successfully connect to the network.)
You should input:
#sudo apt-get install cmake
A prompt will appear when installing, you need to enter Y.
After completion, As shown in the figure below.



5. You need to install library
You should input:
#sudo apt-get install libjpeg8-dev
After completion, As shown in the figure below.

```
root@raspberrypi:/home# sudo apt-get install libjpeg8-dev
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following NEW packages will be installed:
  libjpeg8-dev
0 upgraded, 1 newly installed, 0 to remove and 6 not upgraded.
Need to get 205 kB of archives.
After this operation, 436 kB of additional disk space will be used.
Get:1 http://mirrordirector.raspbian.org/raspbian/ jessie/main libjpeg8-dev a
f 8d1-2 [205 kB]
Fetched 205 kB in 1s (150 kB/s)
Selecting previously unselected package libjpeg8-dev:armhf.
(Reading database ... 125733 files and directories currently installed.)
Preparing to unpack .../libjpeg8-dev_8d1-2_armhf.deb ...
Unpacking libjpeg8-dev:armhf (8d1-2) ...
Setting up libjpeg8-dev:armhf (8d1-2) ...
root@raspberrypi:/home#
```

6.Compiling

Note: we possess two formats of camera (JPEG/YUYV)

6.1) 2-degree-of-freedom camera: **YUYV/JPEG**

If we want to change to the YUYV format, we need to modify the relevant files and compile:

Specific steps as shown below:

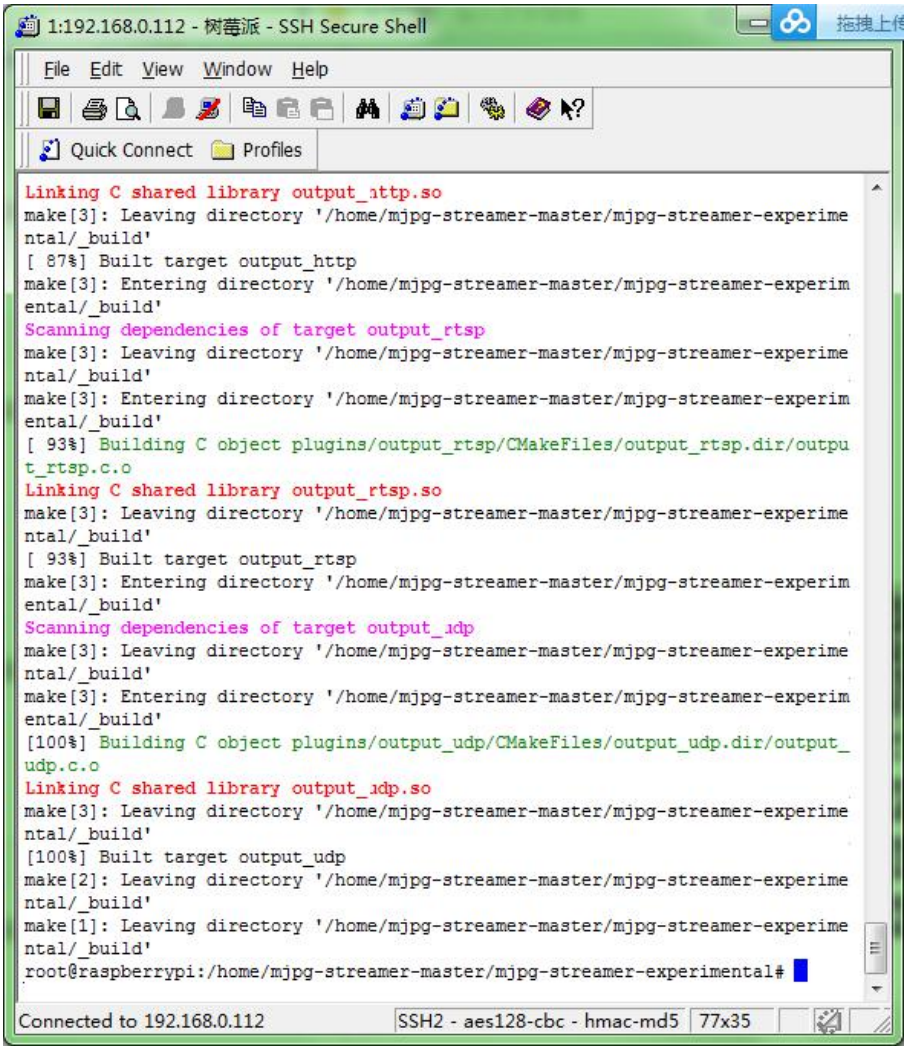
You should enter the **input_uvc.c** file in the **/home/pi/mjpg-streamer-master/mjpg-streamer-experimental/plugins/input_uvc/** directory.

Just modify the format of 135 lines to **V4L2_PIX_FMT_YUYV**

If you want to change the resolution and frame rate of the USB camera, you can change it here.

Then return to **mjpg-streamer-experimental/** input :**make clean all** to complete the compilation.

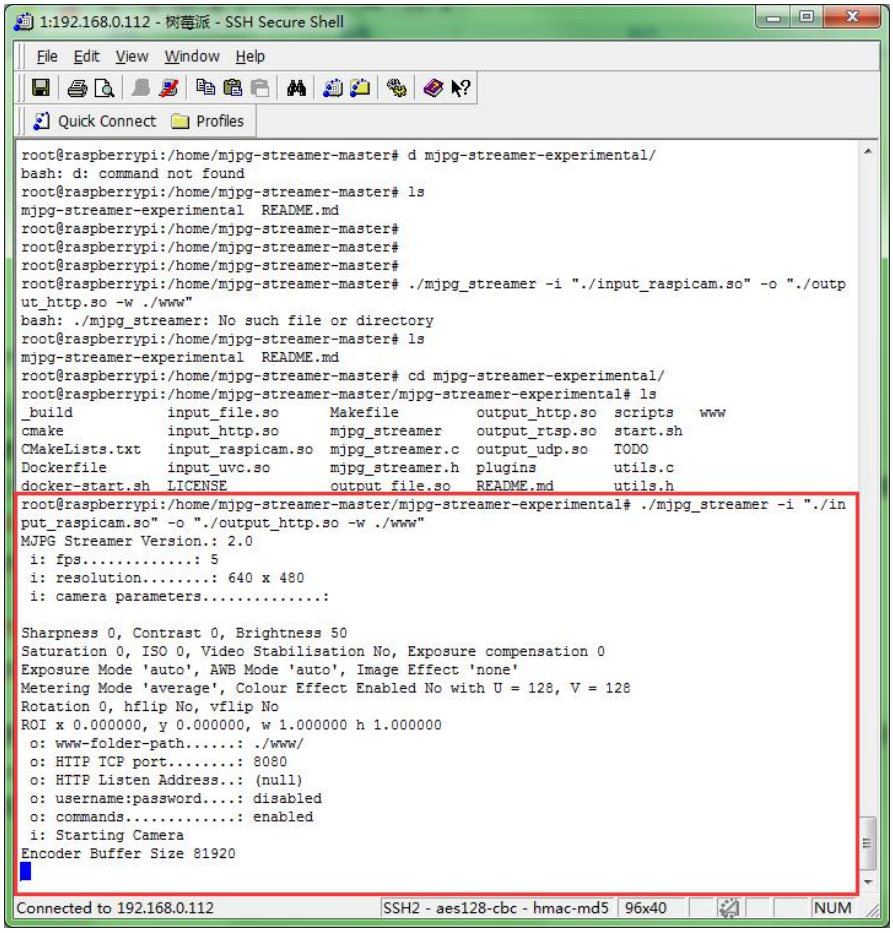
You can wait for the compilation to complete, you can see the interface shown below.



7. Restart system
You need to input: **reboot** to reboot system
Plug in the camera and restart the system.

8. After rebooting, enter the system.
You need to enter the **mjpg-streamer-experimental** directory by command. And use the following command to start the normal USB camera (for 2-DOF cameras):
#./mjpg_streamer -i "./input_uvc.so" -o "./output_http.so -w ./www"

Some cameras will report an error when executing this command. If they do not return to the command prompt and display "Starting Camera", it means success.
As shown in the figure below, the camera is successfully turned on:

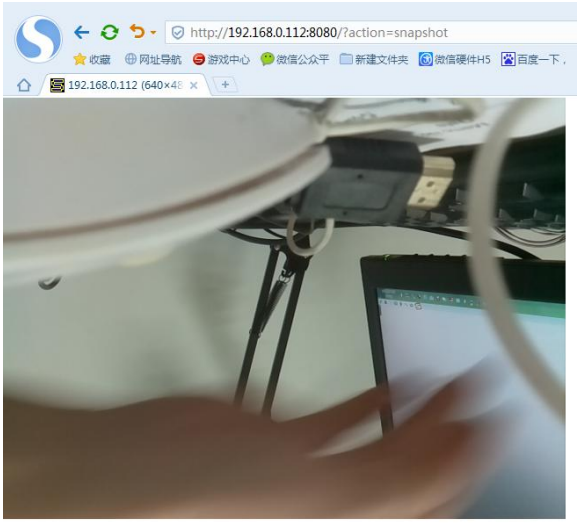


9. Test results

View the image, open the browser on the PC side, you need to enter the following URL to see the static screenshot:

http://<RaspberryPi IP>:8080/?action=snapshot

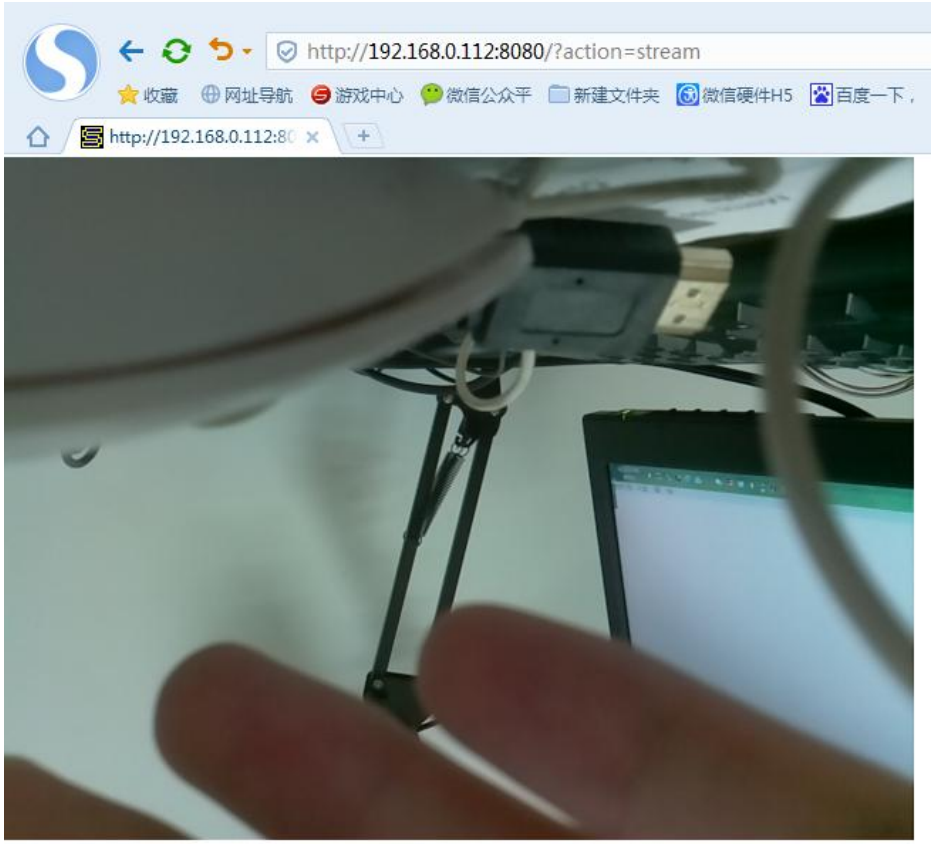
My URL is：http://192.168.0.112:8080/?action=snapshot



You should input the following URL to see the dynamic image:

http://<RaspberryPi IP>:8080/?action=stream

My URL is：http://192.168.0.112:8080/?action=stream



You can also use the following URL:
Http://<RaspberryPi IP>:8080/javascript_simple.html