# Land Explorer

Robot operation manual for quick guide

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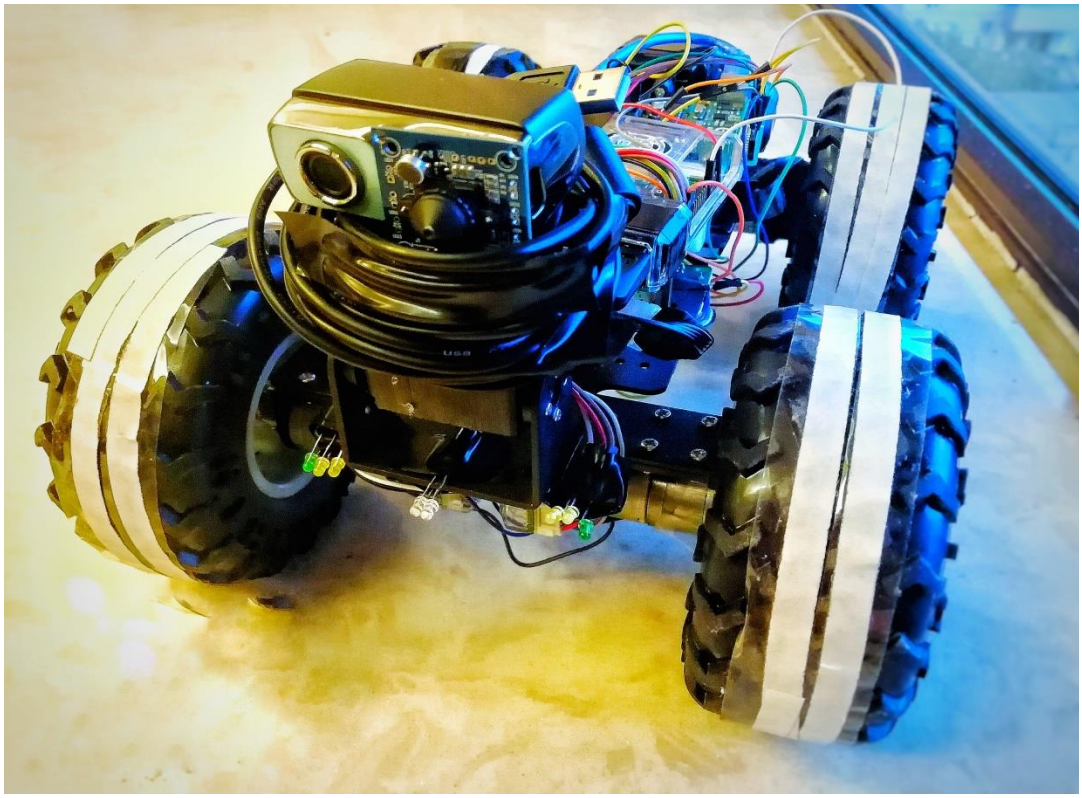
# Introduction

This robot named as “Land Explorer” is used for remote image transmission. It supports several application scenarios, including observation in dynamic, search and rescue in earthquake site, detection in narrow and small space and so on.

The robot is remote controlled by a PS-2 gamepad via 2.4G communication protocol. The gamepad is connected directly to an Arduino, which is connected to an Mbed to control motors.

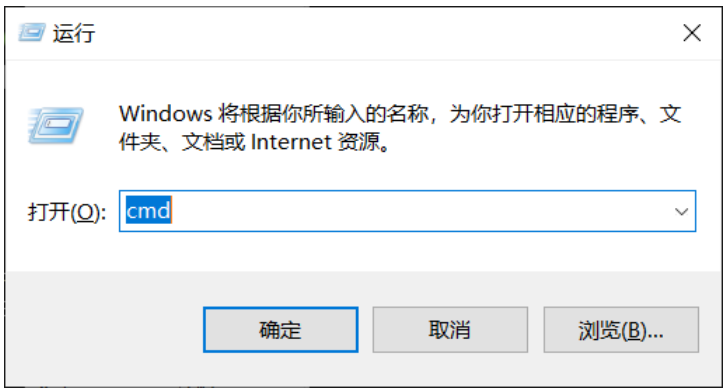
The image is captured by the camera at the front of the robot, and then transmitted to a RaspberryPi. To display the image, a screen might be required to connect to this RaspberryPi wirelessly.



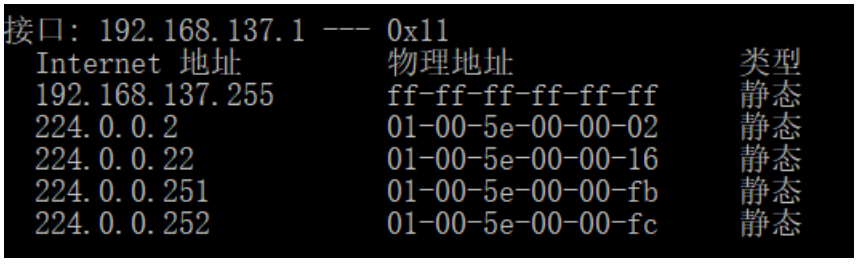
# Image Transmission

To display the image, it is recommended to connect the RaspberryPi to a computer to view the graphical operation interface and then activate the camera. The specific steps are as follows:

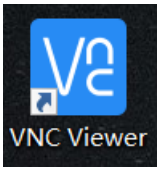
1. To start the RaspberryPi, connect the micro USB port , which is at the right side of the RaspberryPi, to the power bank in the rear end of ‘Land Exporer’.
2. Connect the RaspberryPi to a computer via a reticle. Then, press Win+R and type in ’cmd’ to open command window.




3. In the command window, input ‘arp -a’ to check IP addresses, and find out the one for user’s RaspberryPi.



4. Connect to user's RaspberryPi through "Xshell6" 

5. To use graphical operation interface, log in user's RaspberryPi via "VNC viewer". 

6. Now the RaspberryPi is connected to the computer via wires, while wireless connection is required. Use graphical operation interface to connect user's RaspberryPi to the same network as user's computer, for example a WIFI.
7. Repeat steps 4&5 to log in the RaspberryPi again, but with network IP this time, rather than a reticle.
8. Open "DETECT" folder in terminal and input "sudo ./camera" to execute "camera.exe".
9. Now the camera of "Land Explorer" is in normal operation to transmit image remotely.

# Gamepad Operation

Switch on the gamepad, and then press the start button on Arduino. The gamepad connects to the signal receiver on Arduino automatically.


(Operation instruction graph)

# Appendix

**Power Ratings:**

| | |
|---|---|
| Lithium polymer battery | 12V |
| Power bank | 5V |
| Arduino Power | 5V |
| Mbed Power | 4~9V |
| RaspberryPi Power | 5V |
| L298N Driver Module | 12V |

**Motor PWM：**

| Navigation Mode： | | |
|---|---|---|
| Moving Forward | +0.6 | +0.6 |
| Turning L/R | +0.6 | -0.1 |
| Spot Turning L/R | +0.7 | -0.5 |
| Moving Backward | -0.4 | -0.4 |

(If any problems, please contact my QQ Email：490077929@qq.com)