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概述

使用PIBOT系列机器人，一般下面几个步骤

- 1. 需要通过ssh工具连接小车，启动相关建图与导航程序
- 2. 安装ubuntu主机或者虚拟机，在虚拟机启动Rviz界面观察建图情况和下发命令 这里我们想只使用Android设备完成上面2不操作

ssh连接

- 安装ssh工具juicessh 网盘提供了链接
- 连接网络 Andoid设备连接跟小车主机路由器(树莓派自动启动热点可以直接连接树莓派释放的热点 pibot_ap)
- ssh连接
 - 点击连接，新建一个连接



-
- 插件**
通过第三方插件扩展 JuiceSSH 的功能 
- 解锁高级版功能**
详细了解高级版功能 
- 设置**
定制会话 
- 帮助** 

- 选择机器人的IP，新建一个认证

上午9:57 HD 20%

← **新建连接** ✓

基本设置

昵称: apollo

类型: **SSH** ▼

地址: 100.160.10.1

2 / 17

地址：192.100.12.1

认证：选择一个... ▼

高级设置 新建...

端口：22

连接方式： (可选) ▼

运行代码片段： (可选) ▼

Backspace 模式： 默认发送 (DEL) ▼

连接组

添加到组

- 通过用户名密码认证



认证信息

昵称: (可选)

用户名: `pibot`

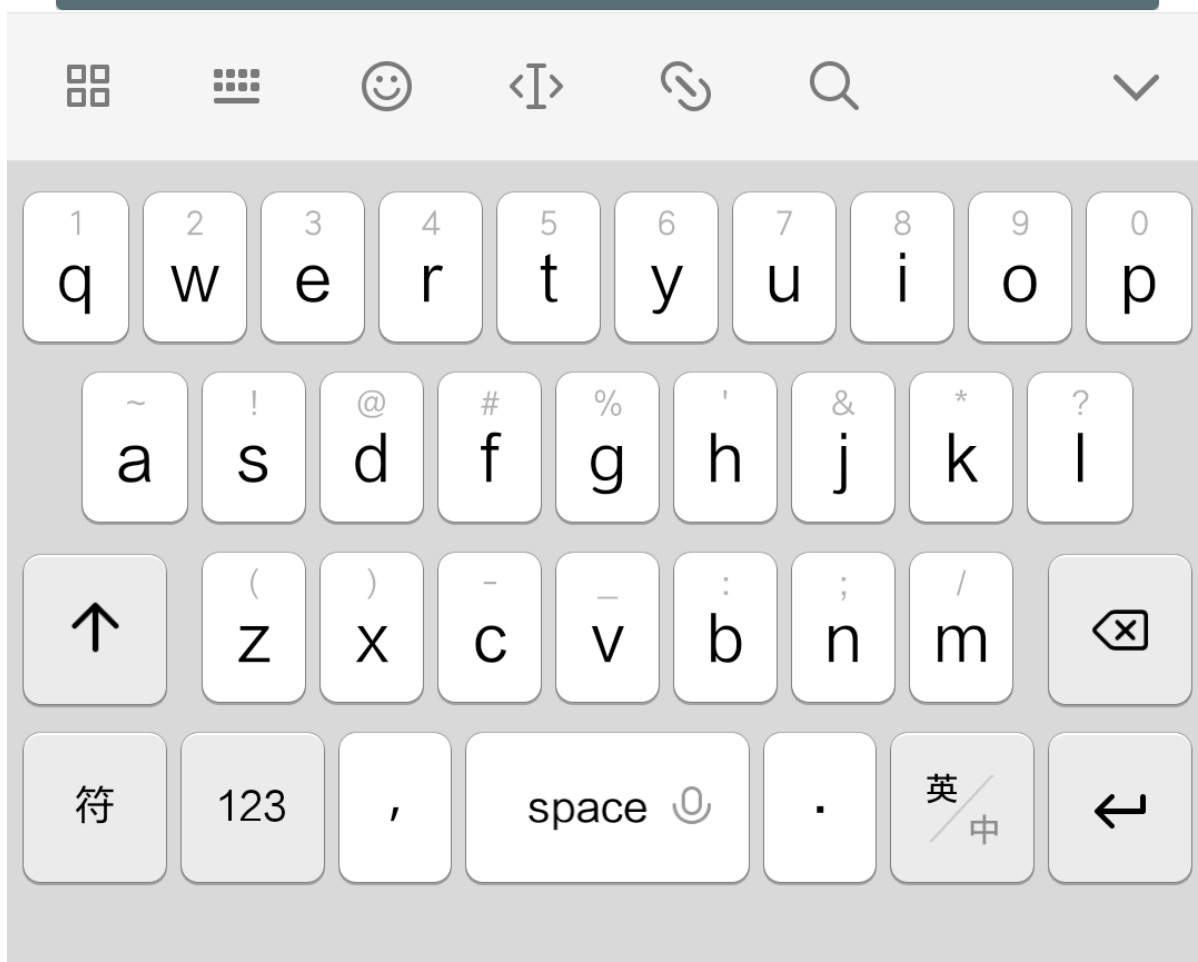
密码: 设置 (可选)

私钥: 设置 (可选)

代码片段

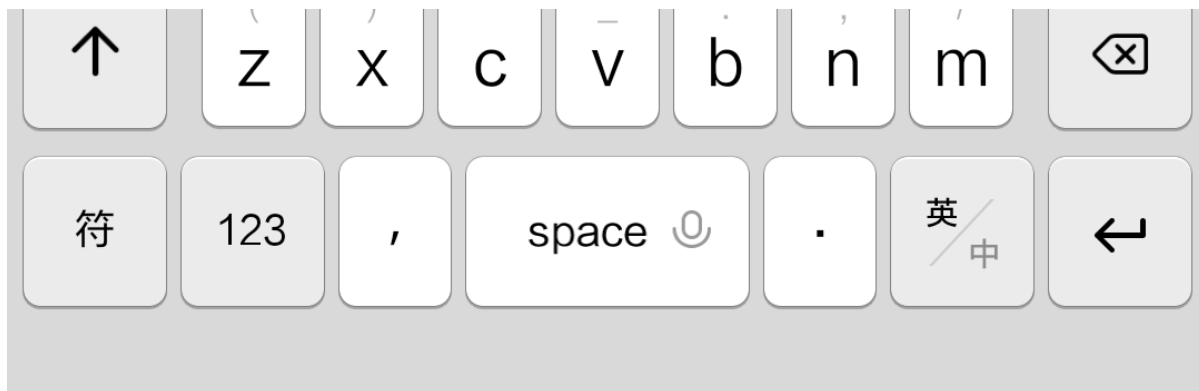
JuiceSSH 高级版用户可以自动创建一个代码片段, 该代码可用于添加公钥到服务器上的 `~/.ssh/authorized_keys` 文件并设置正确的权限。

生成代码片段



- 确认选择





认证信息

昵称: (可选)

用户名: pibot

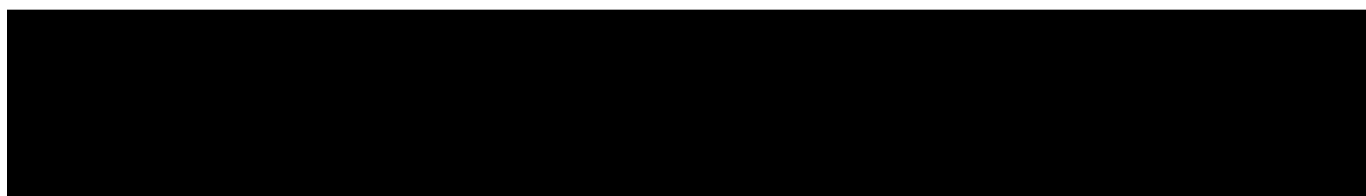
密码: 更新 / 清除

私钥: 设置 (可选)

代码片段

JuiceSSH 高级版用户可以自动创建一个代码片段, 该代码可用于添加公钥到服务器上的 `~/.ssh/authorized_keys` 文件并设置正确的权限。

生成代码片段



新建好一个名为apollo的连接，连接的用户名密码均为pibot

上午9:58 HD 20%

← **新建连接** ✓

基本设置

昵称: apollo

类型: **SSH** ▼

地址: 192.168.12.1

认证: **pibot** ▼

高级设置

端口: 22

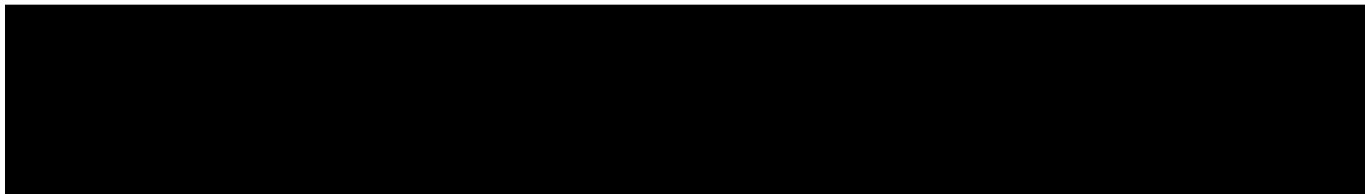
连接方式: (可选) ▼

运行代码片段: (可选) ▼

Backspace 模式: 默认发送 (DEL) ▼

连接组

添加到组



端口转发 **连接** 认证

^ **全部**
未共享

 **apollo**
pibot






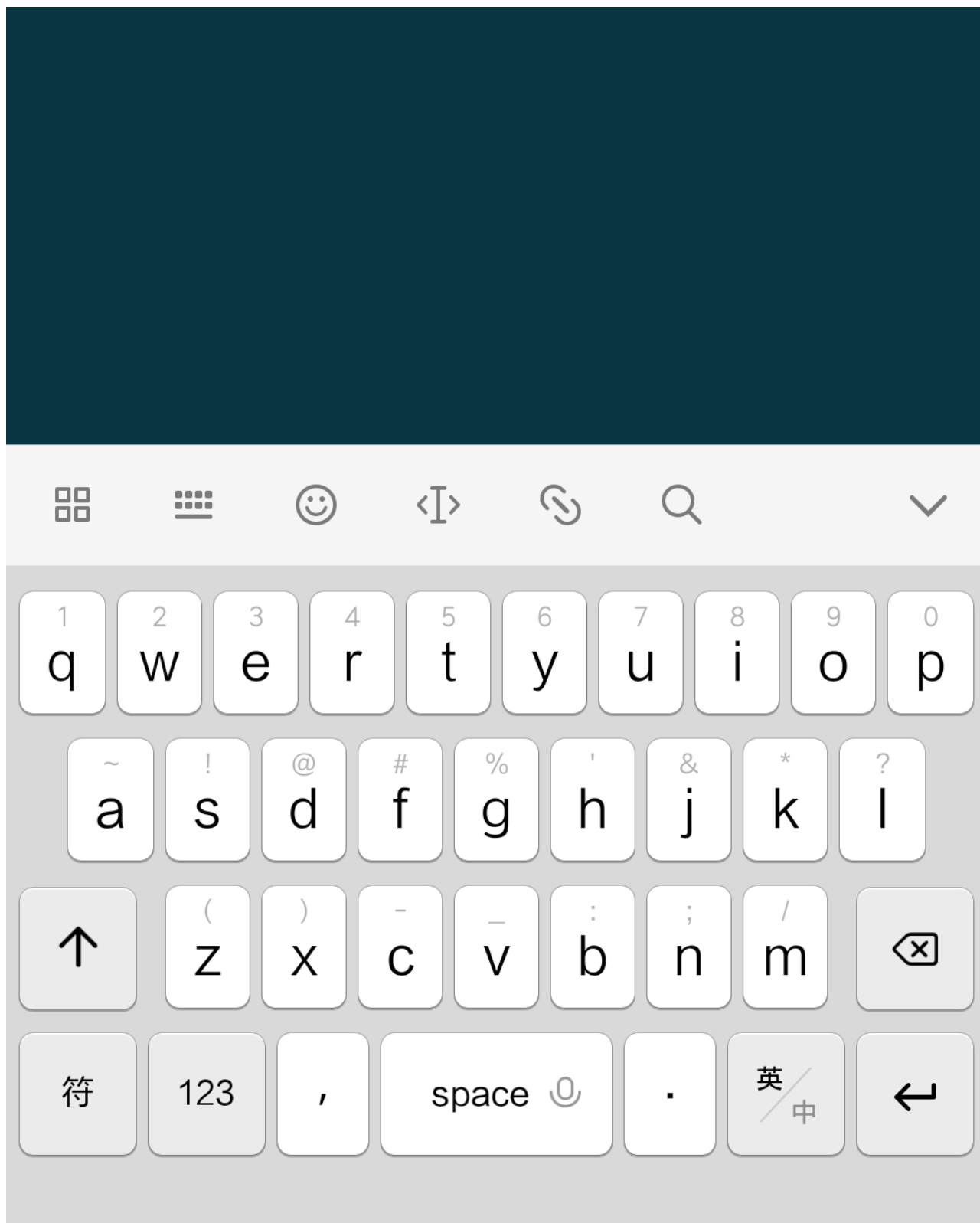
- 下面通过该链接连接至小车

```
上午9:58 HD    20%  
Welcome to Ubuntu 16.04.2 LTS (GNU/Linux 4.4.38-v7+ armv7l)  
  
* Documentation: https://help.ubuntu.com  
* Management:   https://landscape.canonical.com  
* Support:      https://ubuntu.com/advantage  
  
668 packages can be updated.  
268 updates are security updates.  
  
New release '18.04.1 LTS' available.  
Run 'do-release-upgrade' to upgrade to it.  
  
Last login: Mon Oct 1 20:55:19 2018 from 192.168.12.194  
pibot@pibot-desktop:~$ █
```



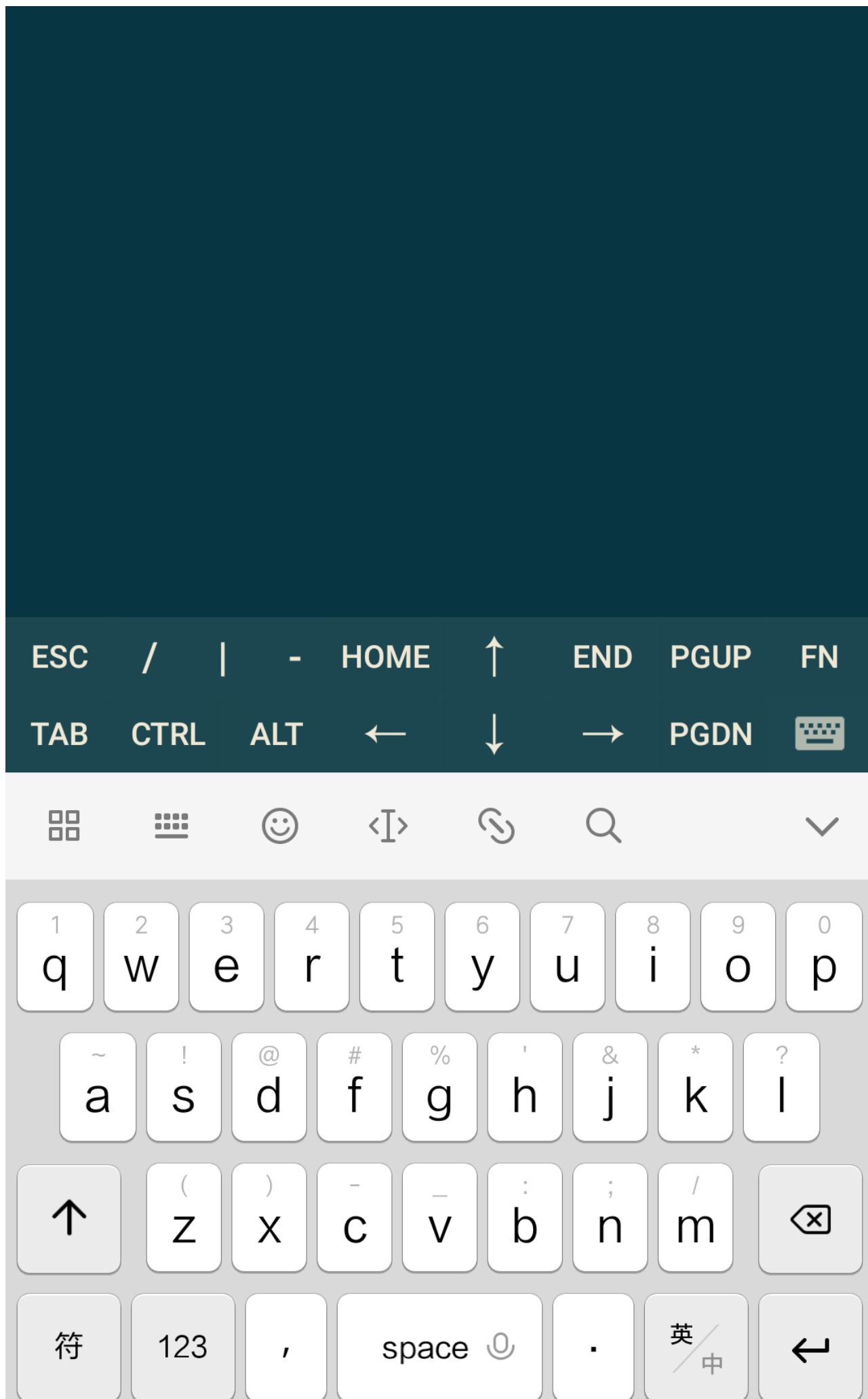
- 连接成功，我们可以输入命令测试usb设备连接情况了

```
上午9:59 ... HD    20%  
piBOT@piBOT-desktop:~$ ls /dev/piBOT /dev/rplidar  
/dev/piBOT /dev/rplidar  
piBOT@piBOT-desktop:~$ █
```



- 同样我们可以输入命令启动建图





- 可以看到**odom received**表示建图程序已经启动了

```

上午9:59
... HD 20%

* /slam_gmapping/ymax: 1.0
* /slam_gmapping/ymin: -1.0
* /use_sim_time: False

NODES
/
  joint_state_publisher (joint_state_publisher/joint_state_publisher)
  move_base (move_base/move_base)
  pibot_driver (pibot_bringup/pibot_driver)
  robot_state_publisher (robot_state_publisher/state_publisher)
  rplidarNode (rplidar_ros/rplidarNode)
  slam_gmapping (gmapping/slam_gmapping)

auto-starting new master
process[master]: started with pid [2843]
ROS_MASTER_URI=http://192.168.12.1:11311

setting /run_id to 1e8ba8ca-c579-11e8-a0fe-b827ebab2b32
process[rosout-1]: started with pid [2884]
started core service [/rosout]
process[pibot_driver-2]: started with pid [2903]
process[joint_state_publisher-3]: started with pid [2904]
process[robot_state_publisher-4]: started with pid [2905]
process[rplidarNode-5]: started with pid [2913]
process[move_base-6]: started with pid [2927]
process[slam_gmapping-7]: started with pid [2942]
[ INFO] [1538398470.995343302]: RPLIDAR running on ROS package rplidar_ros. SDK Ver
sion:1.9.0
[ INFO] [1538398471.037820020]: port:/dev/pibot buadrate:115200
[ INFO] [1538398471.214241322]: out_pid_debug_enable:0
[ INFO] [1538398471.293336270]: BaseDriver startup
[ INFO] [1538398471.304387833]: connected to main board
Transport main read/write started
[ INFO] [1538398473.304943457]: end sleep
[ INFO] [1538398473.311528718]: robot version:v1.1.1 build time:20180801-m3e0
[ INFO] [1538398473.315710488]: subscribe cmd topic on [cmd_vel]
[ INFO] [1538398473.354830488]: advertise odom topic on [odom]
[ INFO] [1538398473.373424447]: Robot Parameters: 65 175 1980 10 250 2500 0 10 250 4
0 0 200 69
RPLIDAR S/N: BCB39DF1C3E39AC4C3E698F94C64340D
[ INFO] [1538398473.519532103]: Firmware Ver: 1.24
[ INFO] [1538398473.519729238]: Hardware Rev: 5
[ INFO] [1538398473.523615488]: RPLidar health status : 0
[ INFO] [1538398473.532867936]: Using plugin "static_layer"
[ INFO] [1538398473.687638249]: Requesting the map...
[ INFO] [1538398474.122255801]: current scan mode: Express, max_distance: 12.0 m, P
oint number: 4.0K , angle_compensate: 1
[ INFO] [1538398474.892624602]: Laser is mounted upwards.
-maxUrange 7 -maxUrange 8 -sigma 0.05 -kernelSize 3 -lstep 0.05 -lobsGain 3 -a
step 0.05
-srr 0.01 -srt 0.02 -str 0.01 -stt 0.02
-linearUpdate 0.05 -angularUpdate 0.0436 -resampleThreshold 0.5
-xmin -1 -xmax 1 -ymin -1 -ymax 1 -delta 0.05 -particles 8
[ INFO] [1538398474.908551269]: Initialization complete
update frame 0
update ld=0 ad=0
Laser Pose= 0 0 0.00872684
m_count 0
Registering First Scan

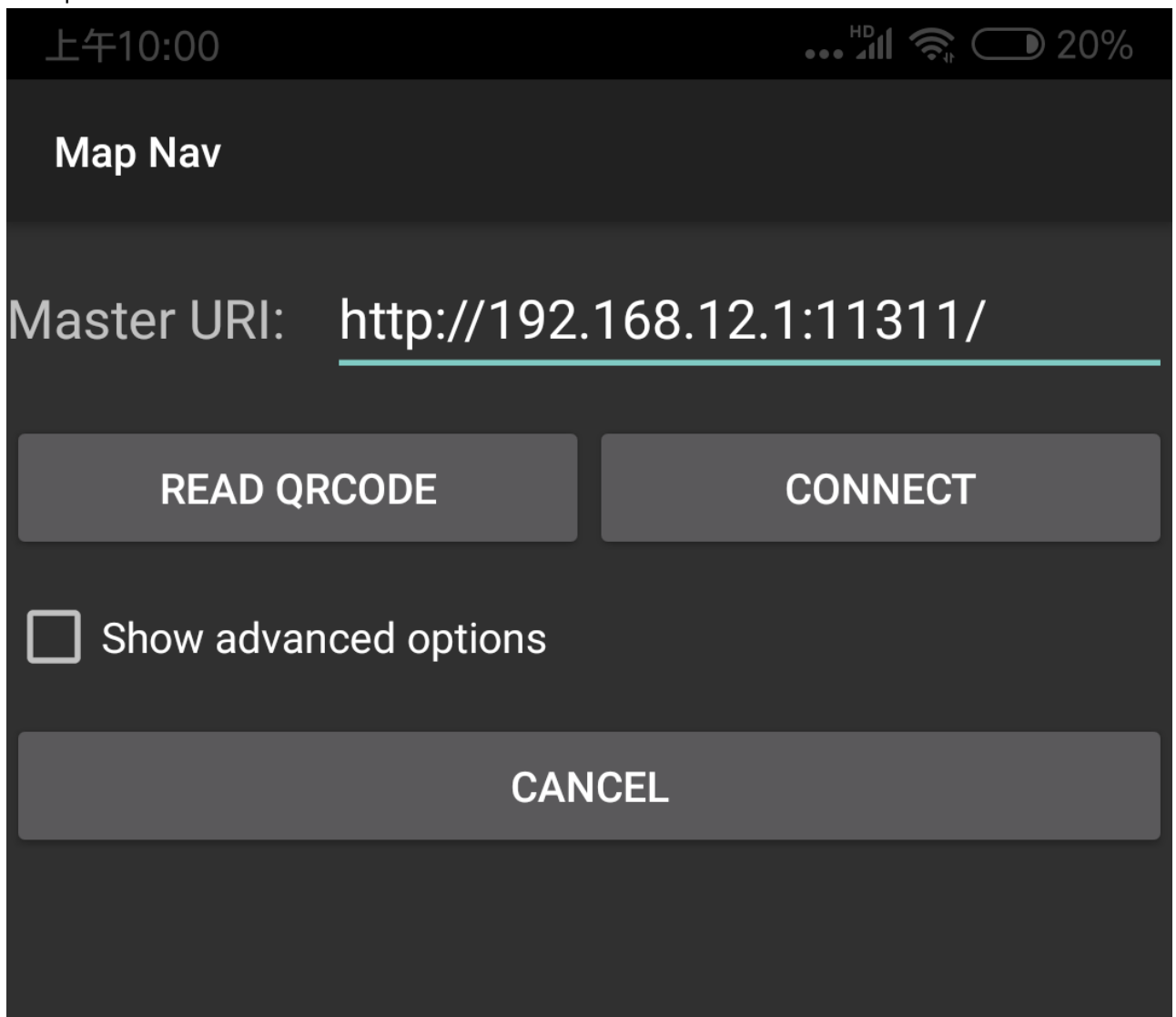
```

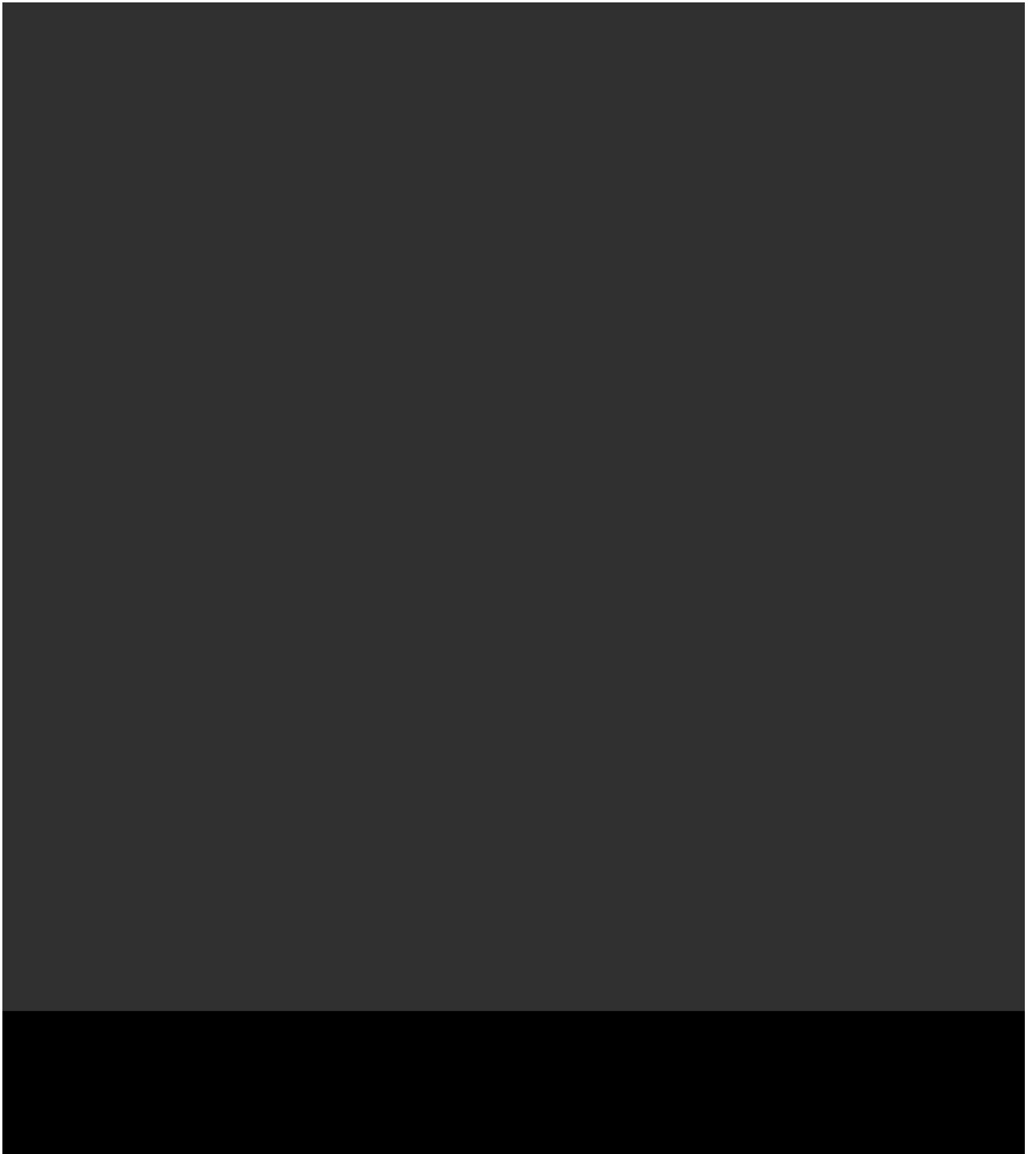
```
[ INFO] [1538398475.027453561]: Resizing costmap to 480 X 576 at 0.050000 m/pix
[ INFO] [1538398475.123128769]: Received a 480 X 576 map at 0.050000 m/pix
[ INFO] [1538398475.165993873]: Using plugin "obstacle_layer"
[ INFO] [1538398475.196626529]:     Subscribed to Topics: scan
[ INFO] [1538398475.577308092]: Using plugin "inflation_layer"
[ INFO] [1538398476.434336320]: Using plugin "obstacle_layer"
[ INFO] [1538398476.463857466]:     Subscribed to Topics: scan
[ INFO] [1538398476.842267987]: Using plugin "inflation_layer"
[ INFO] [1538398477.417371581]: Created local_planner dwa_local_planner/DWAPlanerR
OS
[ INFO] [1538398477.460401320]: Sim period is set to 0.20
[ INFO] [1538398479.304330174]: Recovery behavior will clear layer obstacles
[ INFO] [1538398479.368967517]: Recovery behavior will clear layer obstacles
[ INFO] [1538398479.817992465]: odom received!
```

地图显示与控制

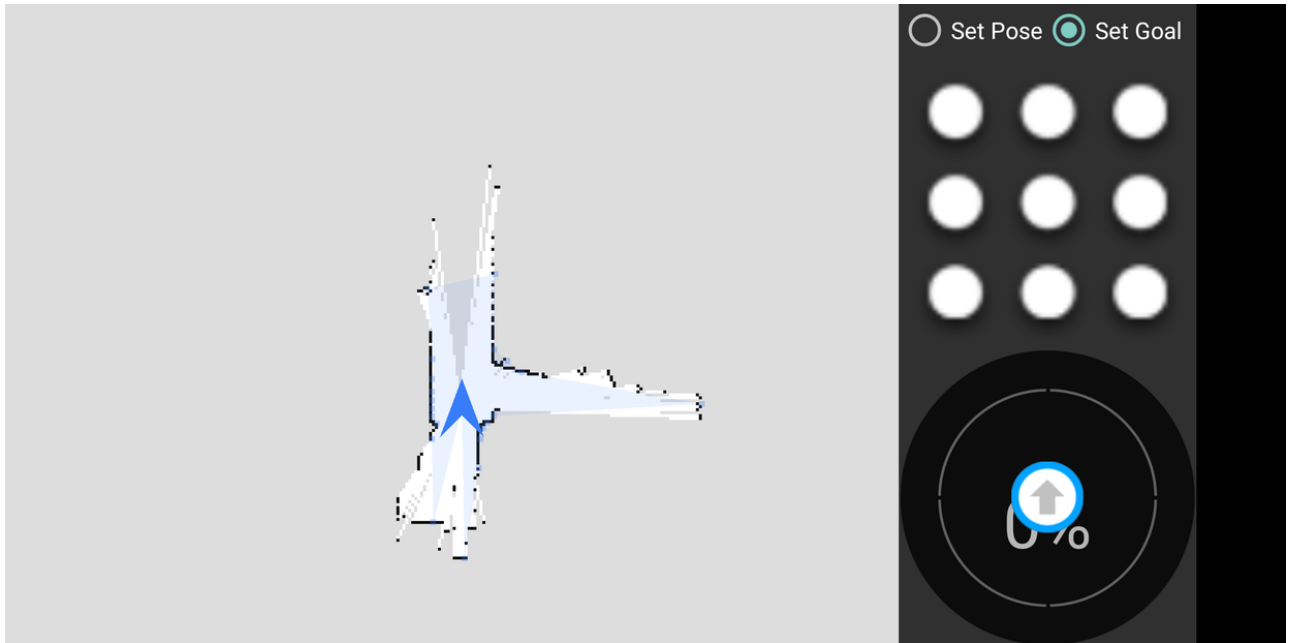
通过map_nav app我们可以显示地图

- 输入ip连接机器人





- 显示地图



- 控制行走或者设置目标点即可建图

