

ROS产品开发



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内容提要

产品开发

Bulldog机器人特点

3D建图与导航

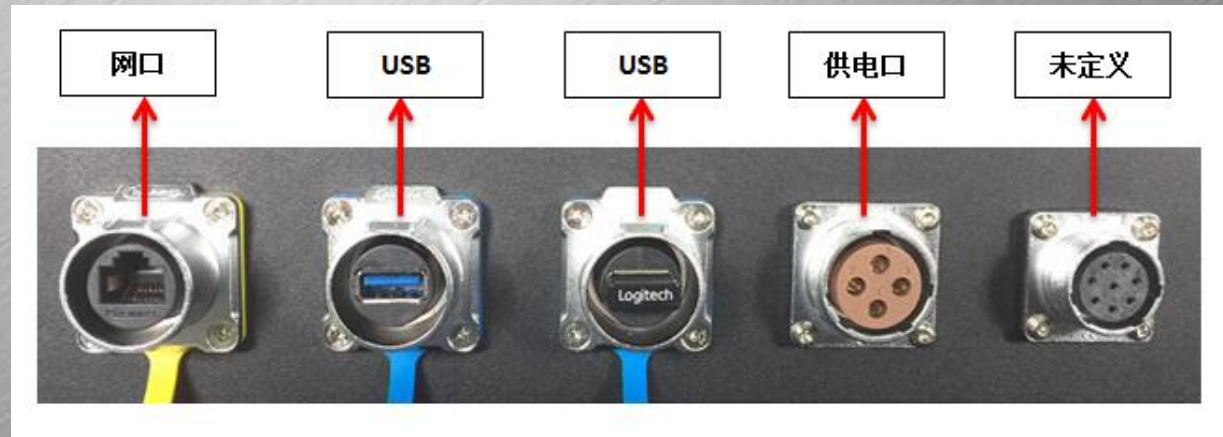
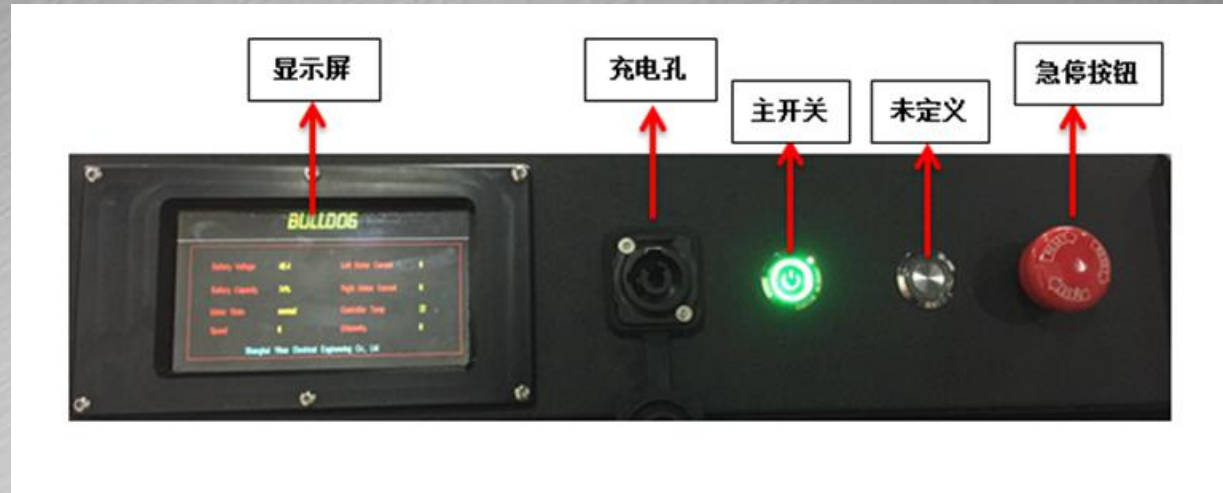
移动抓取

无人驾驶

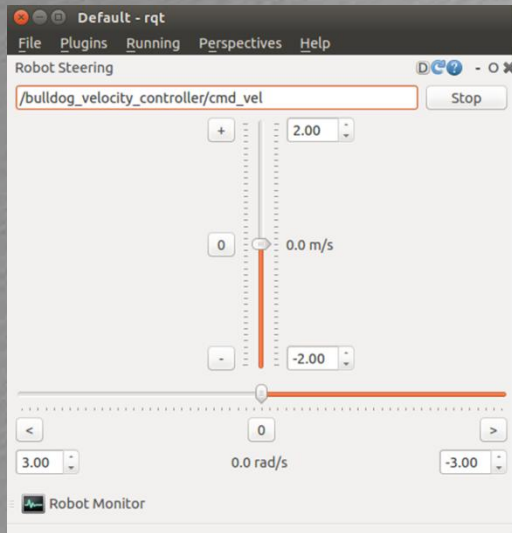
多机协同

设备特点

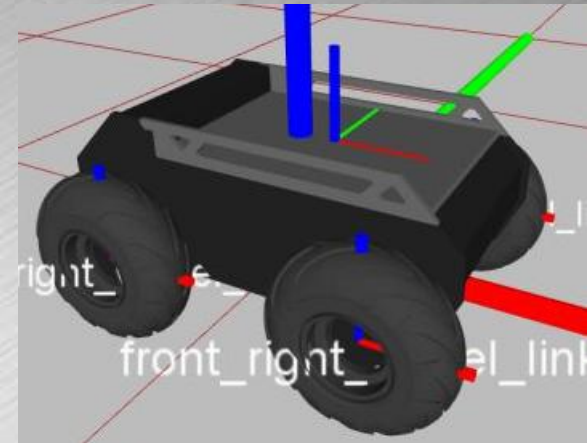
- IP67防水
- 大功率Maxon电机
- 温度、电流保护
- 对外供电与通讯



ROS支持

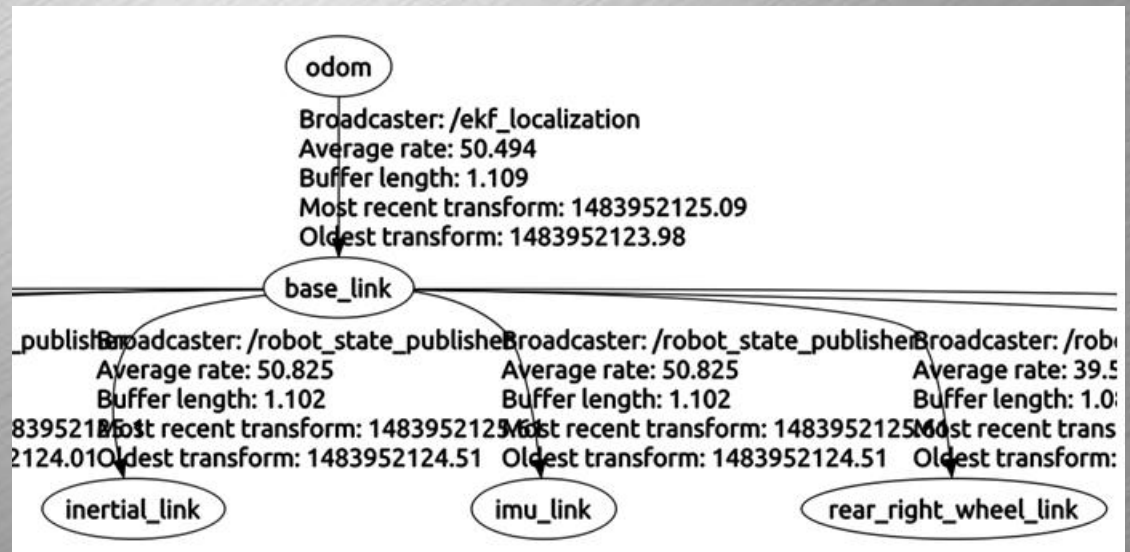


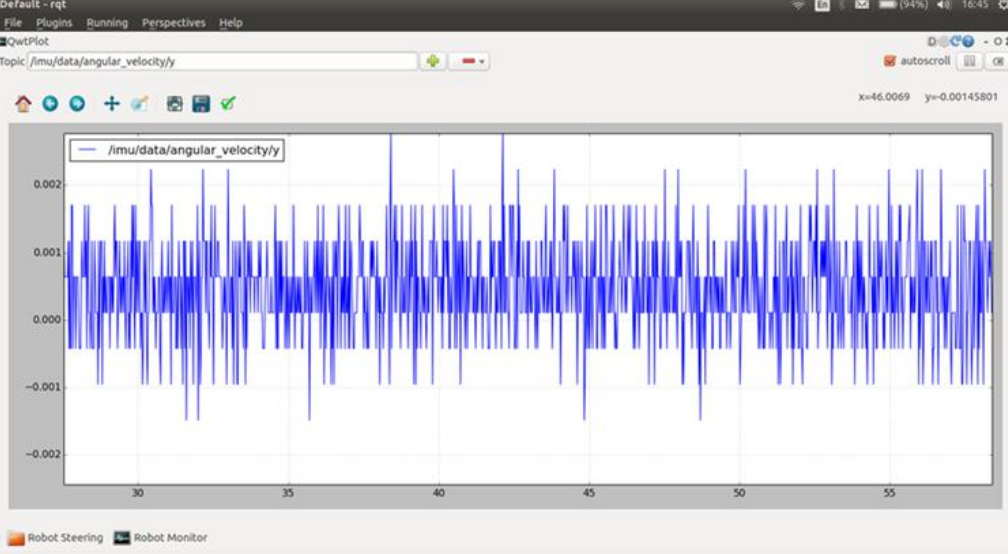
- ros control
- URDF
- IMU
- TF



```

frog@frog-e460: ~
/home/frog/test_ws/s * frog@frog-e460: ~ * frog@frog-e460: ~
frog@frog-e460:~$ rostopic echo /imu/data
header:
  seq: 864
  stamp:
    secs: 1483951389
    nsecs: 9867906
  frame id: imu_link
orientation:
  x: 0.00334275937691
  y: 0.00617266100401
  z: 0.50744936372
  w: 0.859694012663
orientation_covariance: [1e-06, 0.0, 0.0, 0.0,
angular_velocity:
  x: 0.000798168737639
  y: -0.000957802485166
  z: 0.0
angular_velocity_covariance: [0.02, 0.0, 0.0,
linear_acceleration:
  x: -0.057386736
  y: 0.111186801
  z: 9.762918462
    
```





- rqt
- diagnostic

Warned Device	Message
All devices	
▼ Bulldog	OK
✓ Battery Status	OK
✓ Controller Status	OK
⚠ Motor Status	OK
✓ Robot Status	OK
▼ Other	OK
✓ ekf_localization: Filter diagnostic updater	The ro
✓ ekf_localization: odometry filtered topic status	Desire

/Bulldog/Motor Status

Full Name: /Bulldog/Motor Status
 Component: Motor Status
 Hardware ID: Bulldog
 Level: OK
 Message: OK

Left Motor Current (A): 0
 Right Motor Current (A): 0
 Left Motor Encoder Counts: 0
 Right Motor Encoder Counts: 0
 Left Motor Temperature (C): 21.0182
 Right Motor Temperature (C): 19.8929

new →

← old

Pause

Snapshot

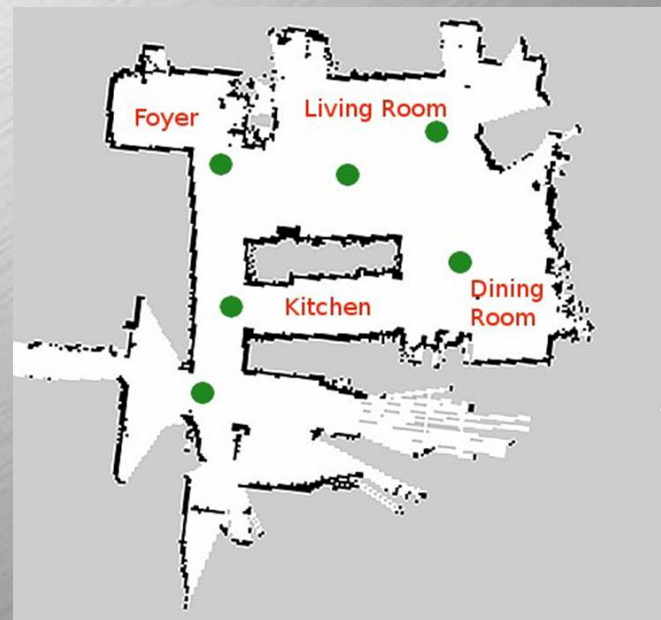
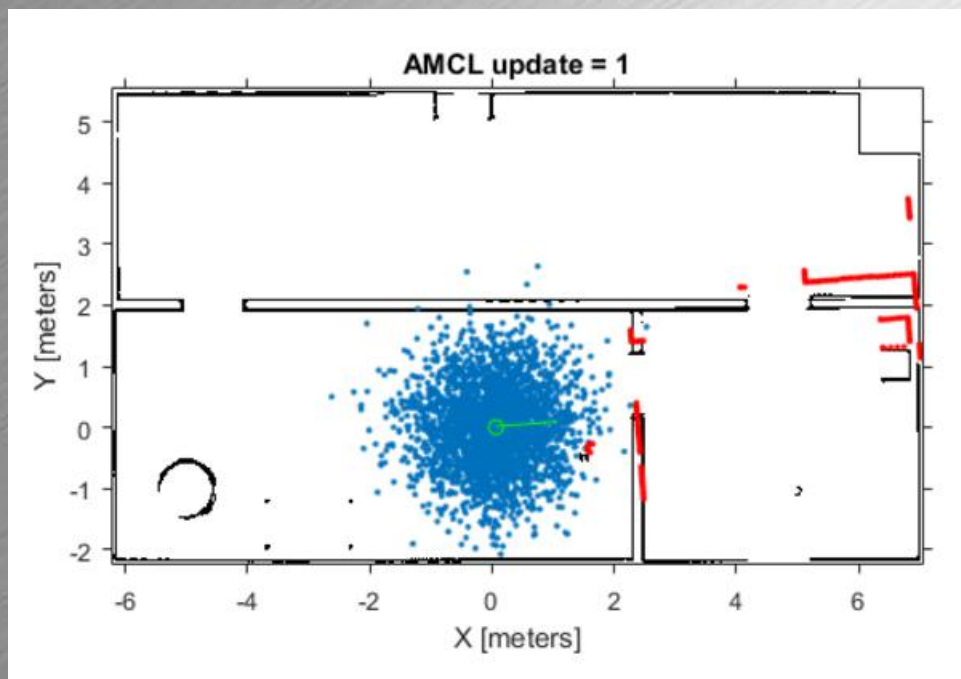
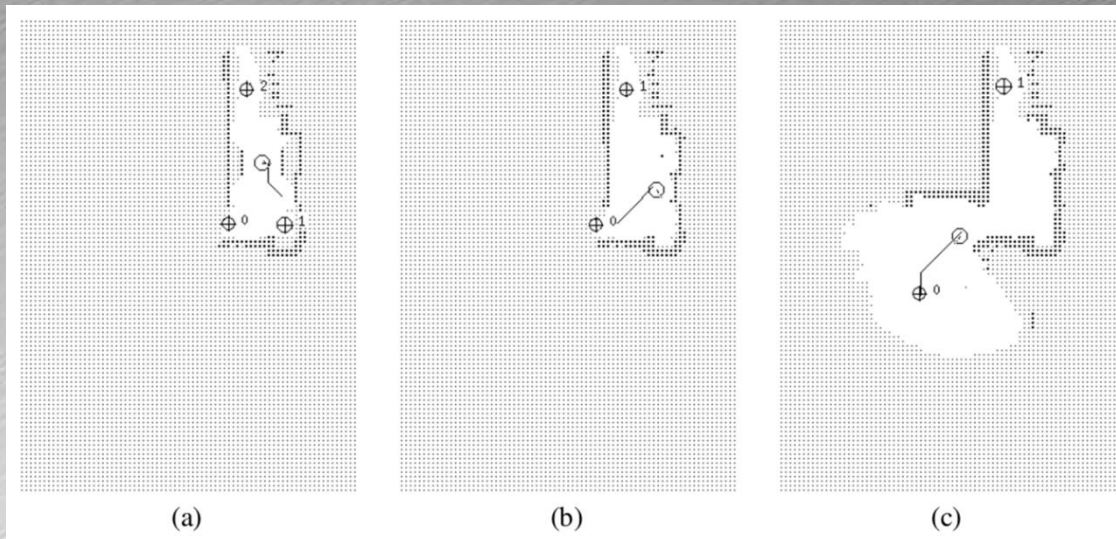
3D建图与导航

- 差分GPS
- 9 Dof IMU
- 16/32线激光雷达
- 工业相机

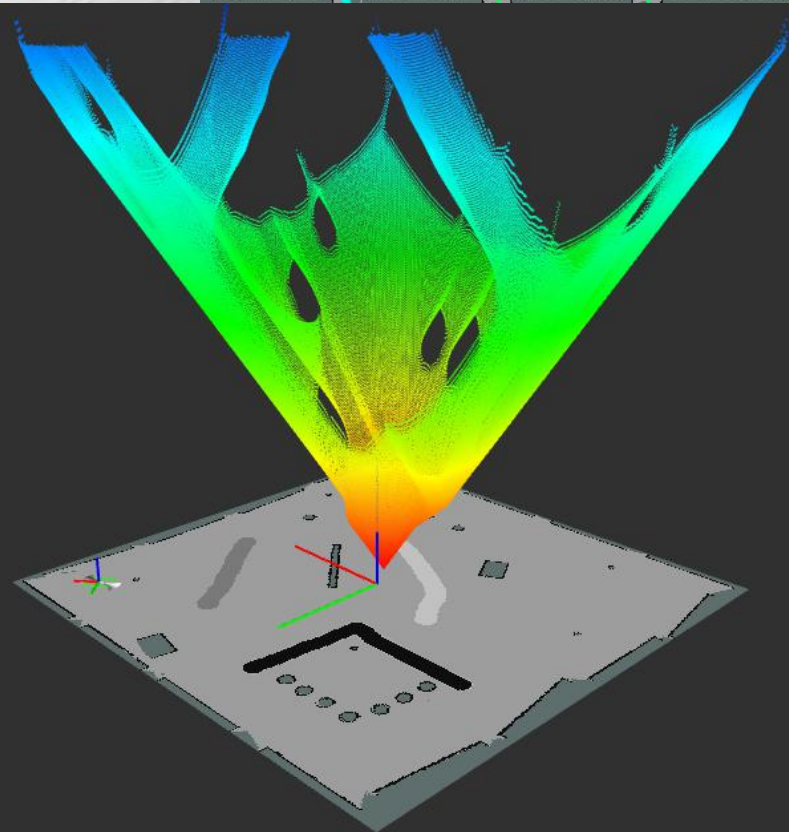
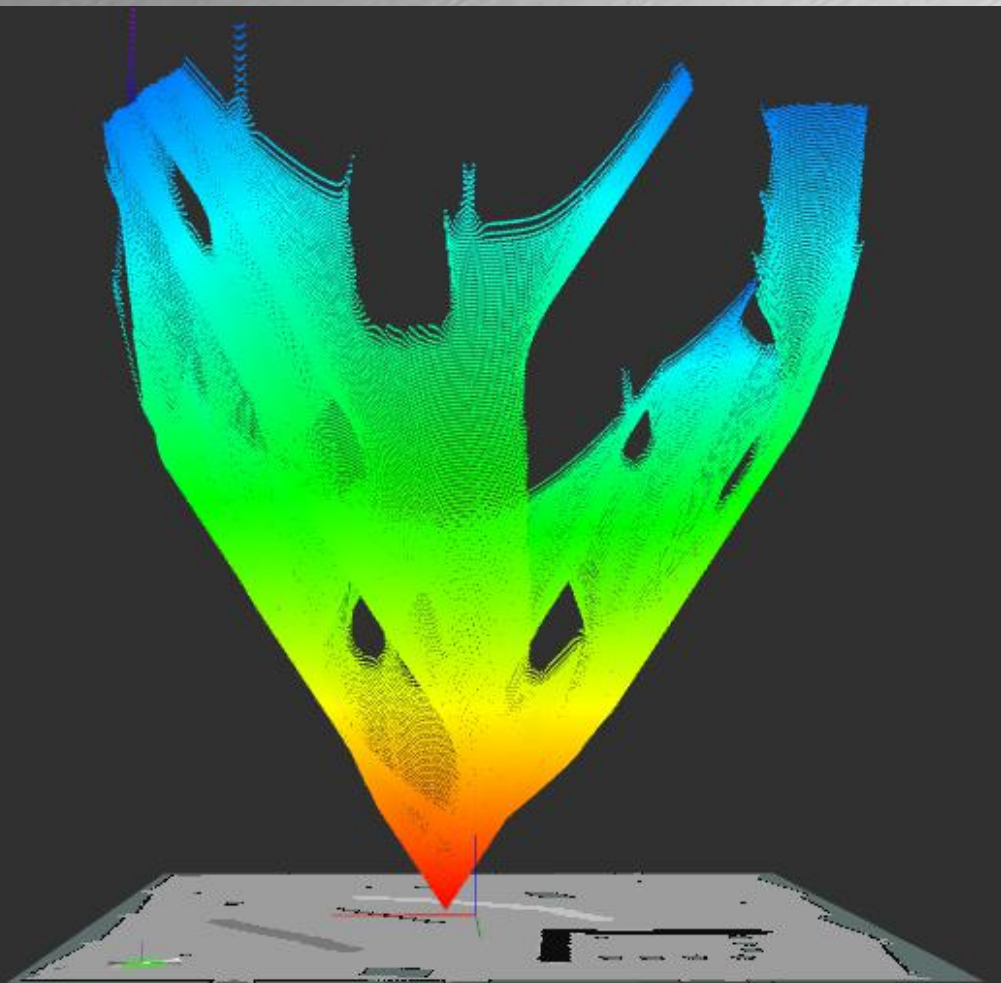
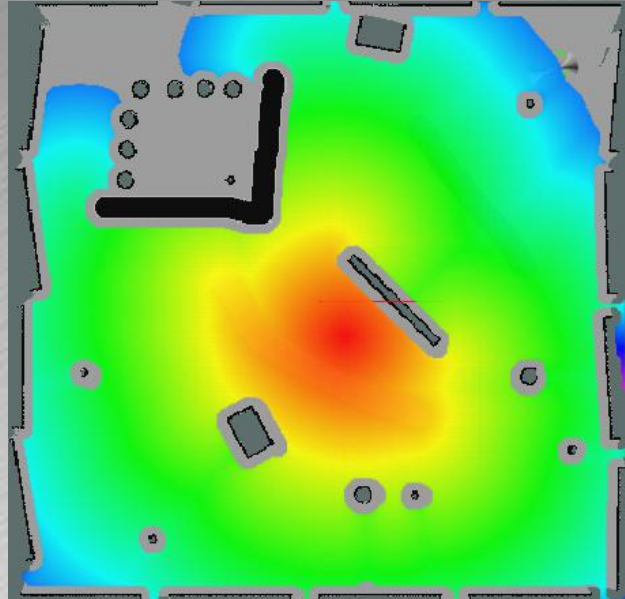


SLAM

- Gmapping
- AMCL
- Frontier Exploration

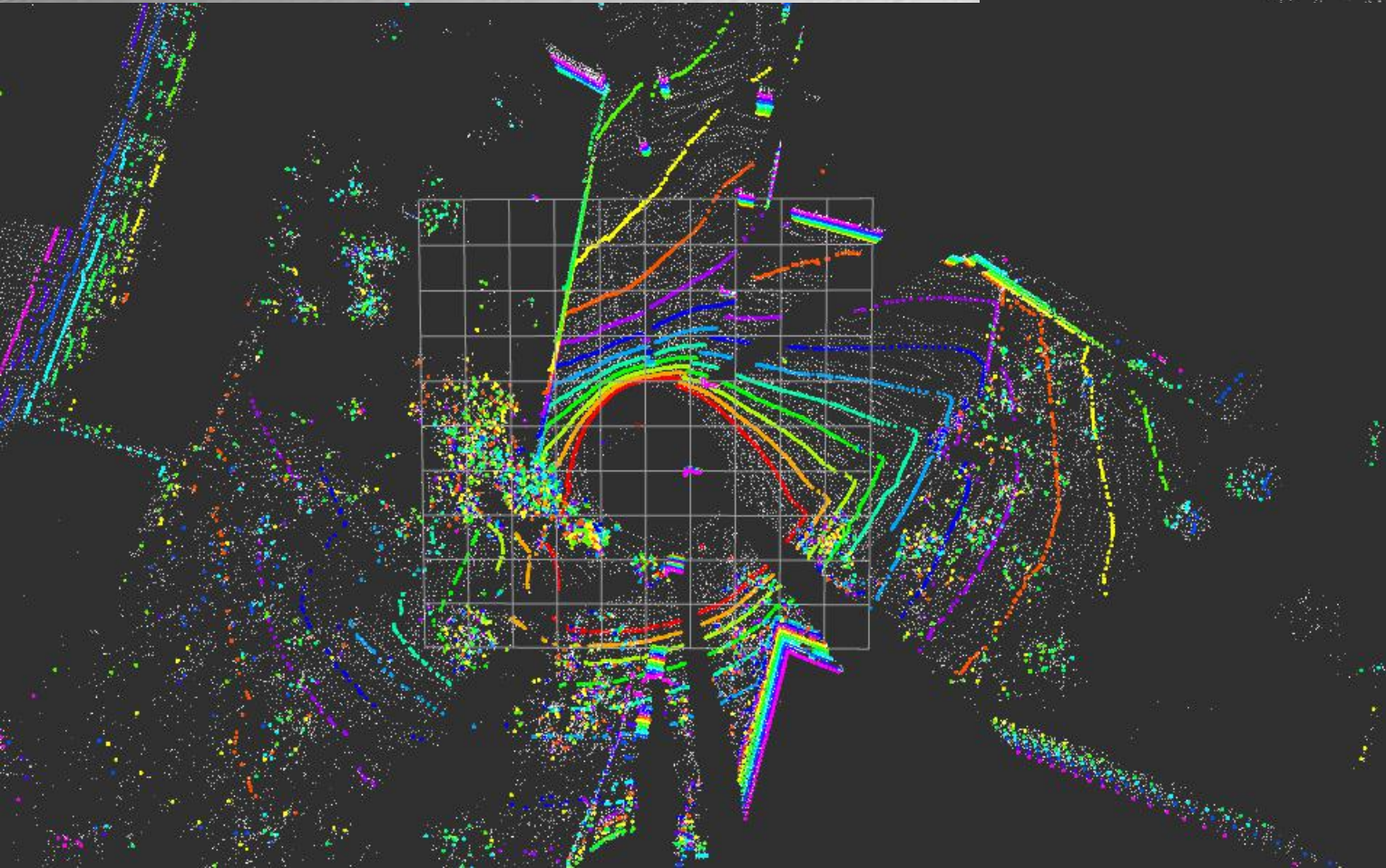
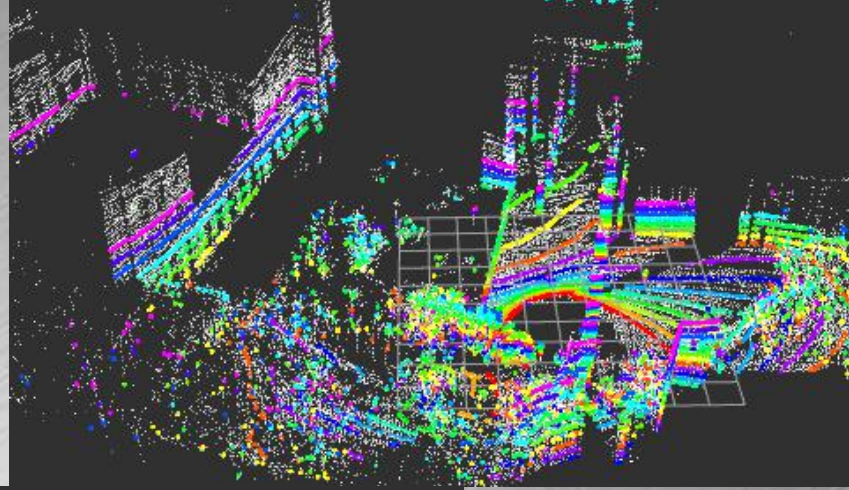


地图势场

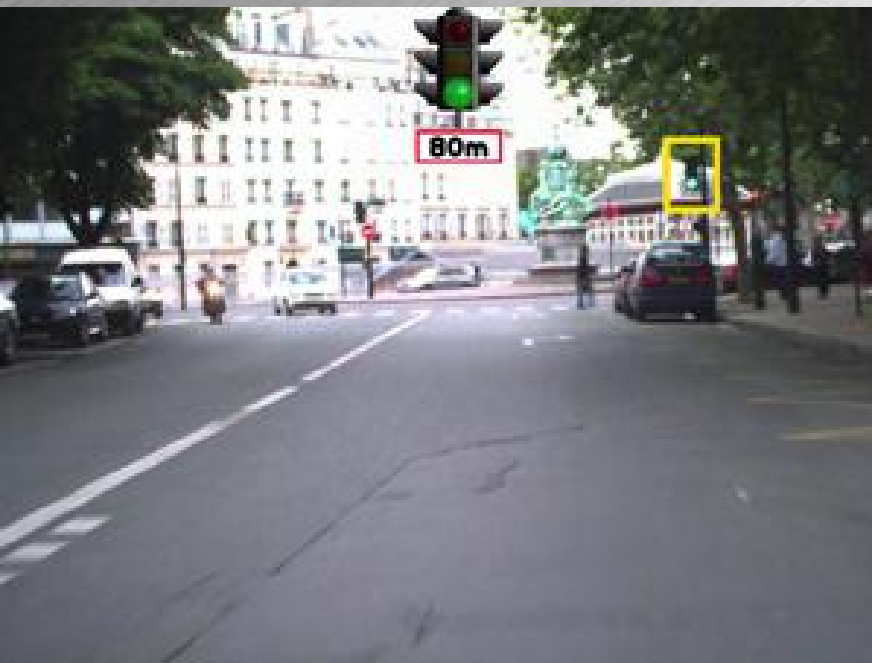
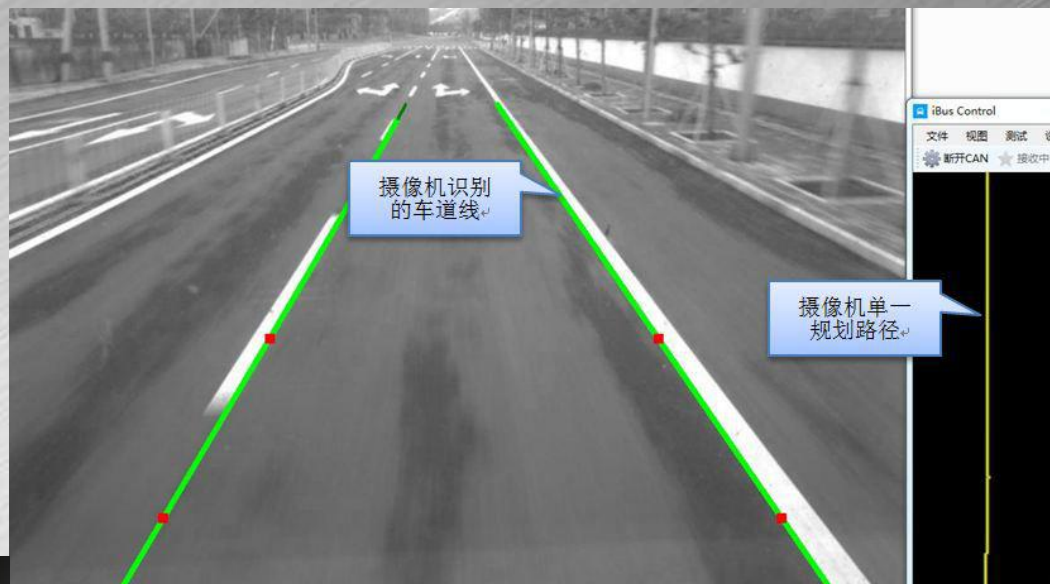


三维点云地图

- ICP & NDT
- LOAM

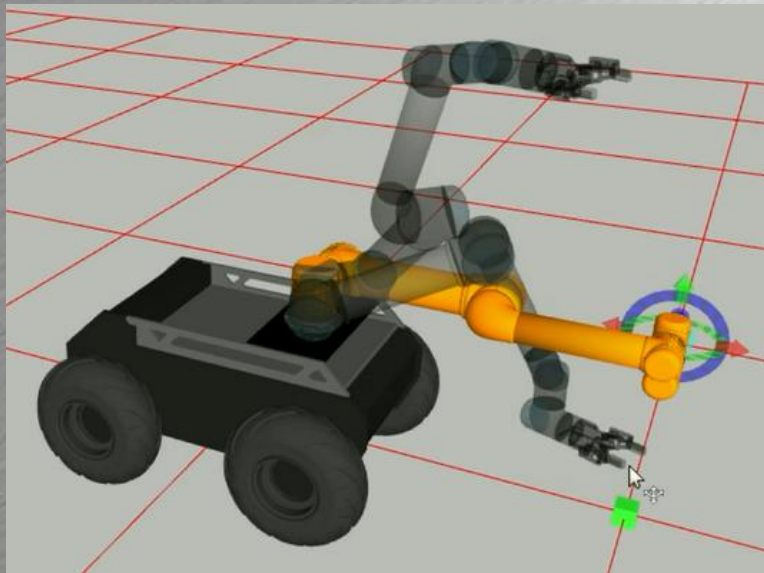


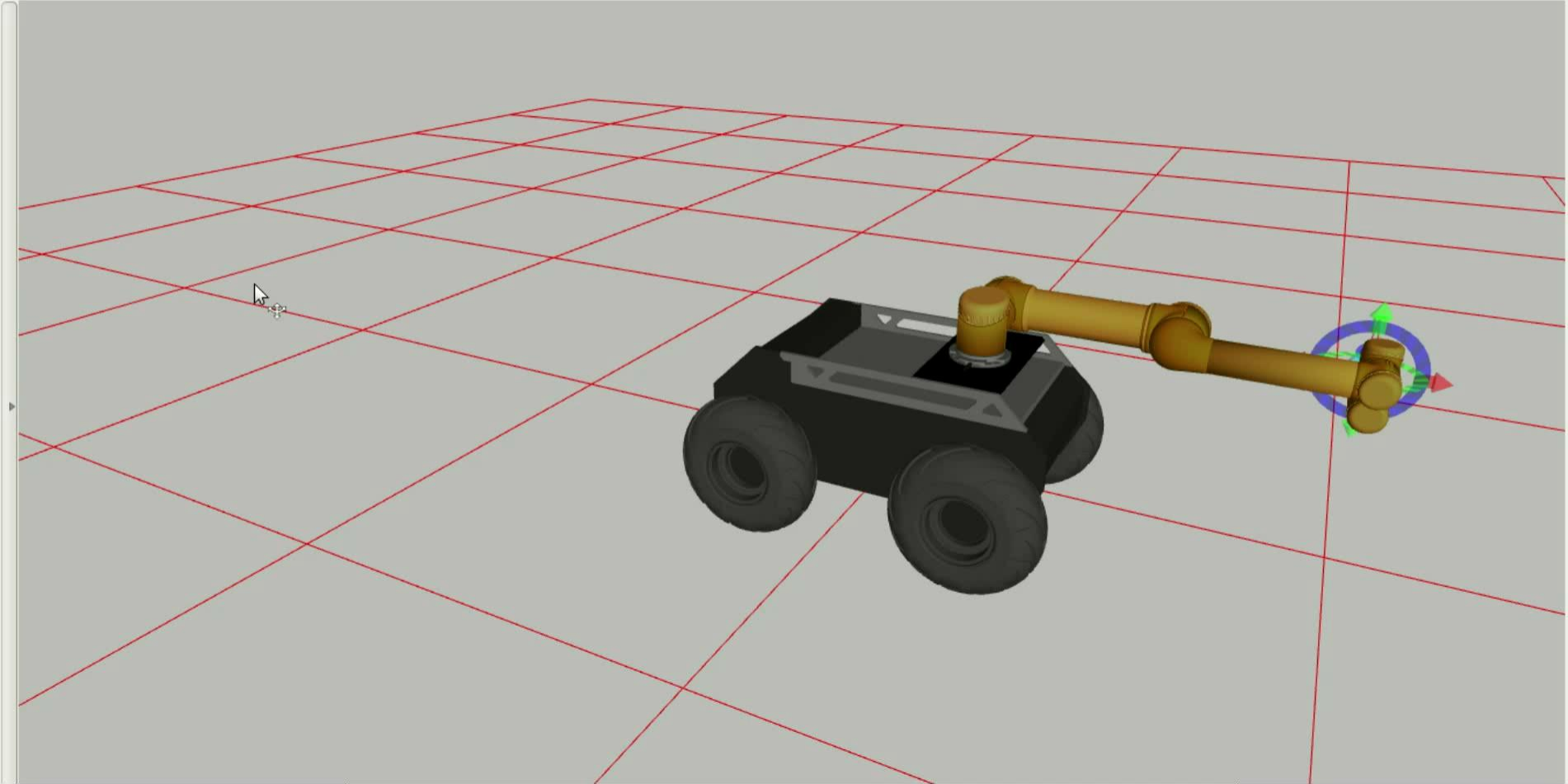
信号灯识别与车道保持



ICRA移动抓取2017

- RGBD 传感器
- 2指夹持器
- UR5机械臂

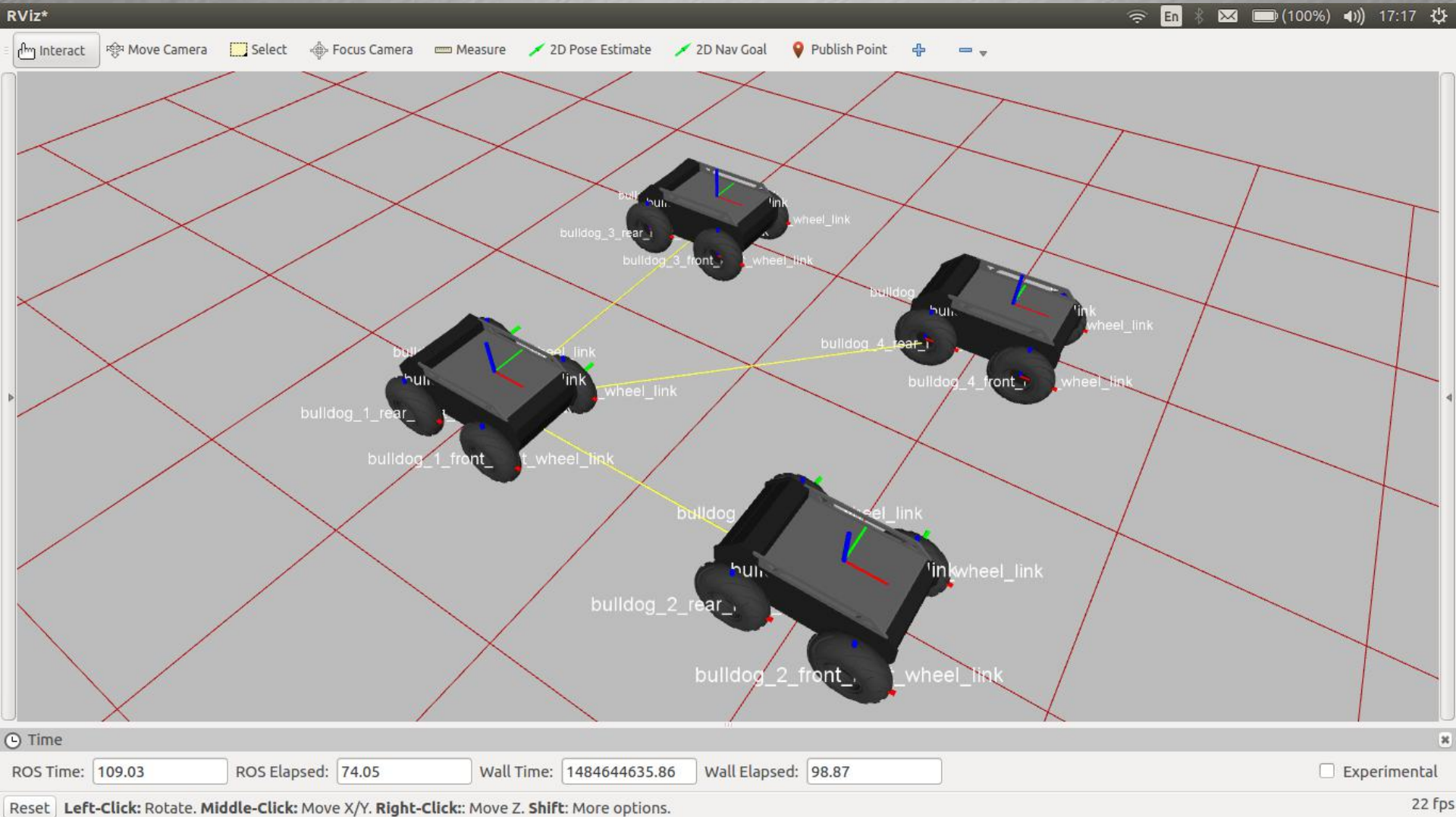




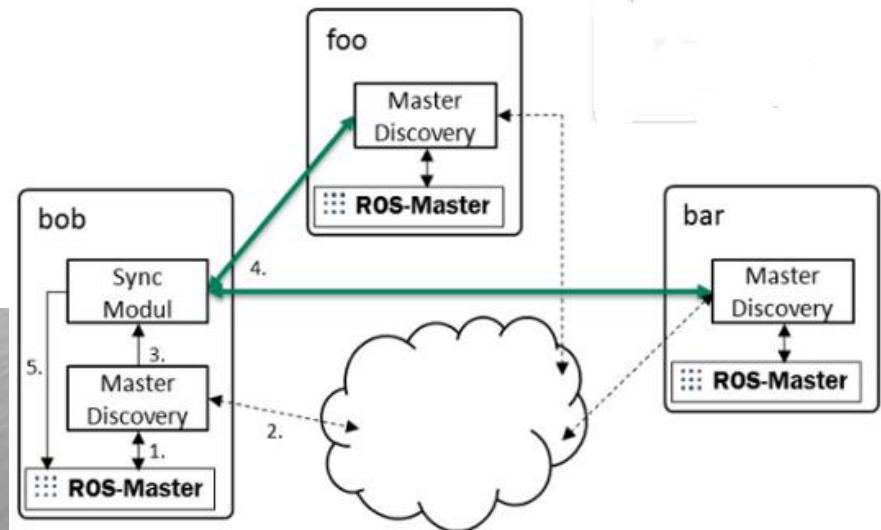
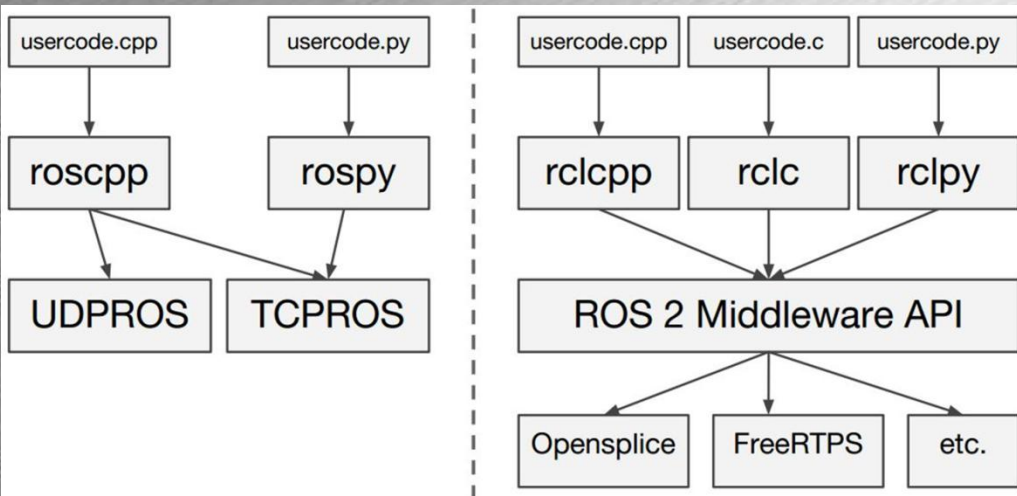
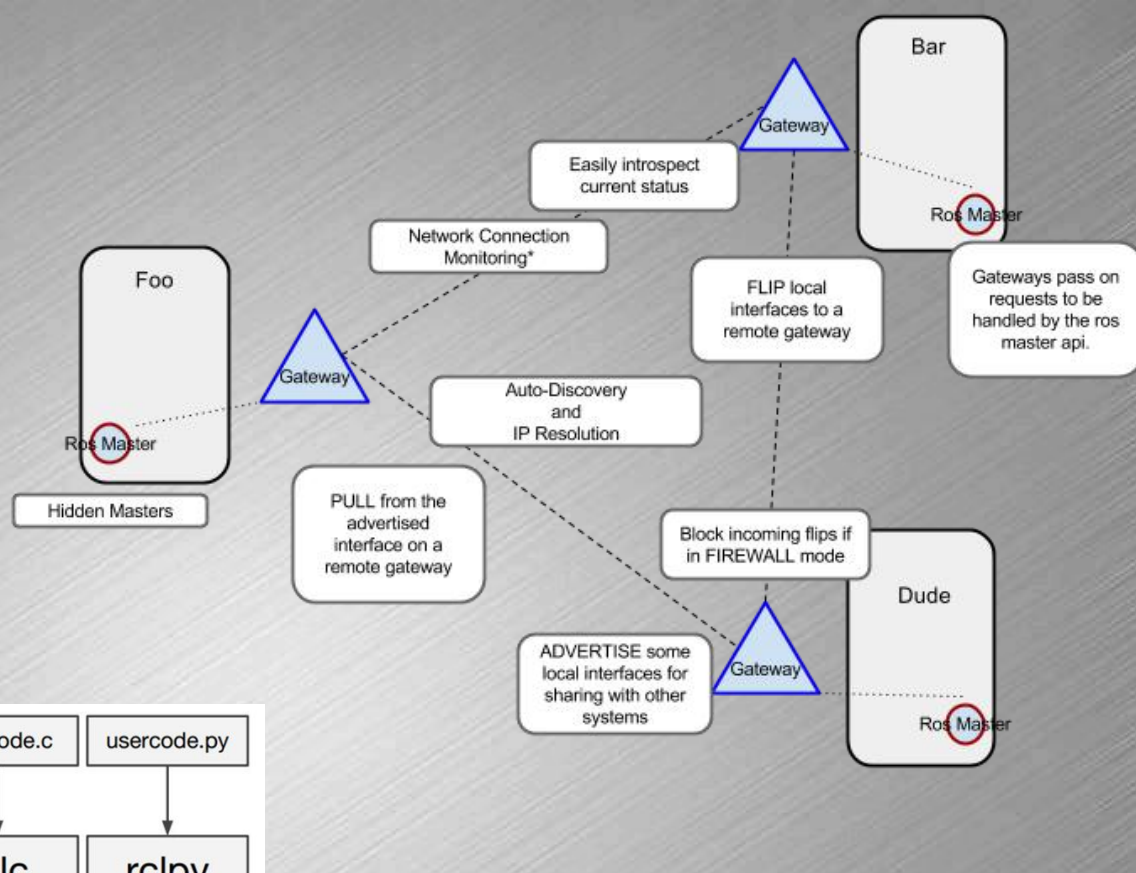


多机协同

- Ad hoc
- multi master
- 救援
- 巡逻
- 故障冗余

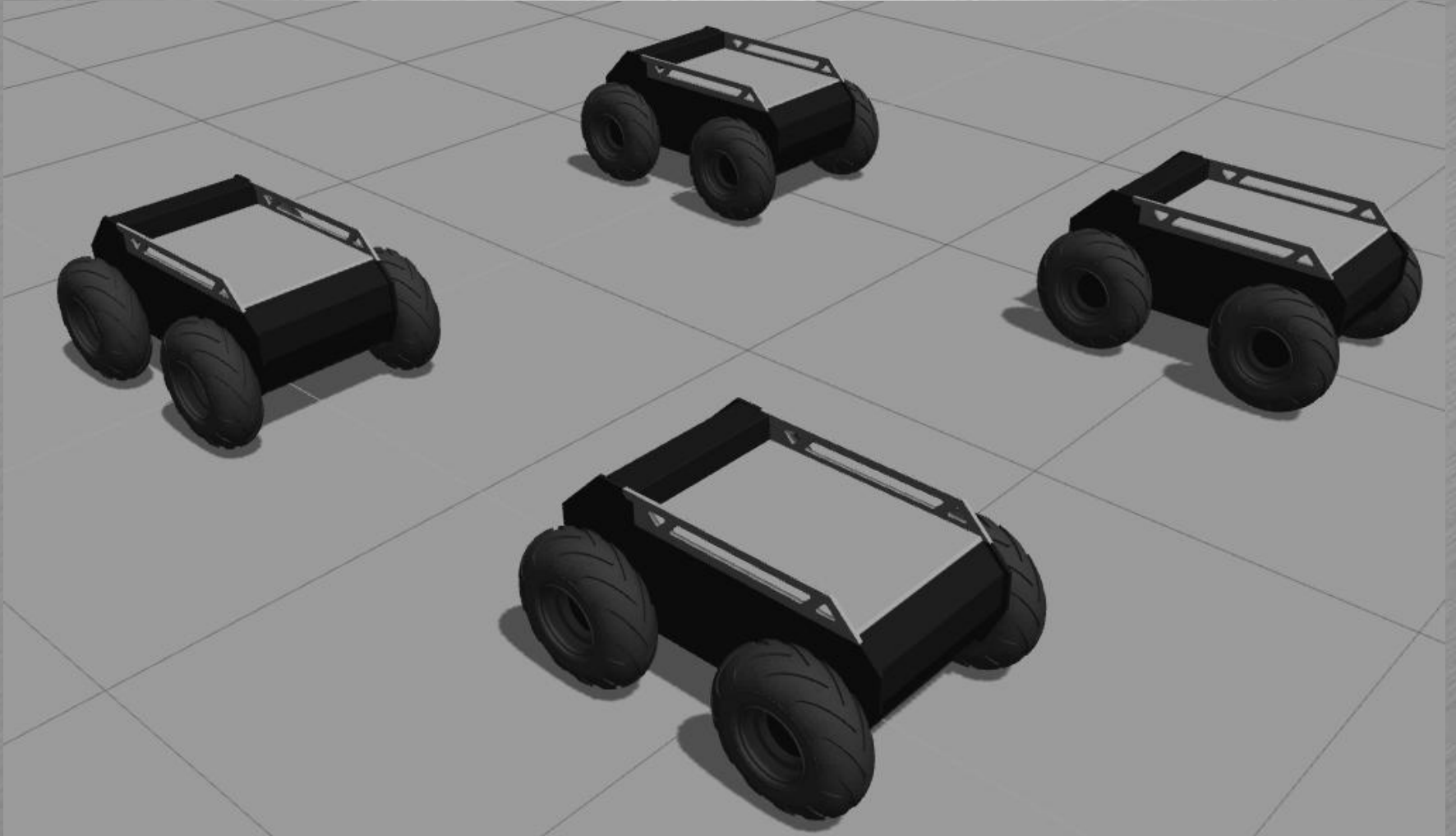


- rocon_multimaster
- multimaster_fkie
- ROS 2.0



Socket server

- 地图共享
- 指令队列



QUESTIONS?

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