



서봇

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척척박사
20141118 - 전수현
20151095 - 김은영



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업무 처리 시간 감소 및
소비자들의 대기시간 감소

| 기획 설계



Created by Pham Duy Phuong Hung
from Noun Project



Created by Signs
from Noun Project



Created by iconcheese
from Noun Project



Created by Arjen Schen
from Noun Project



Created by Rose Alice Design
from Noun Project



Created by johanna
from Noun Project



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from Noun Project



Created by Arjen Schen
from Noun Project

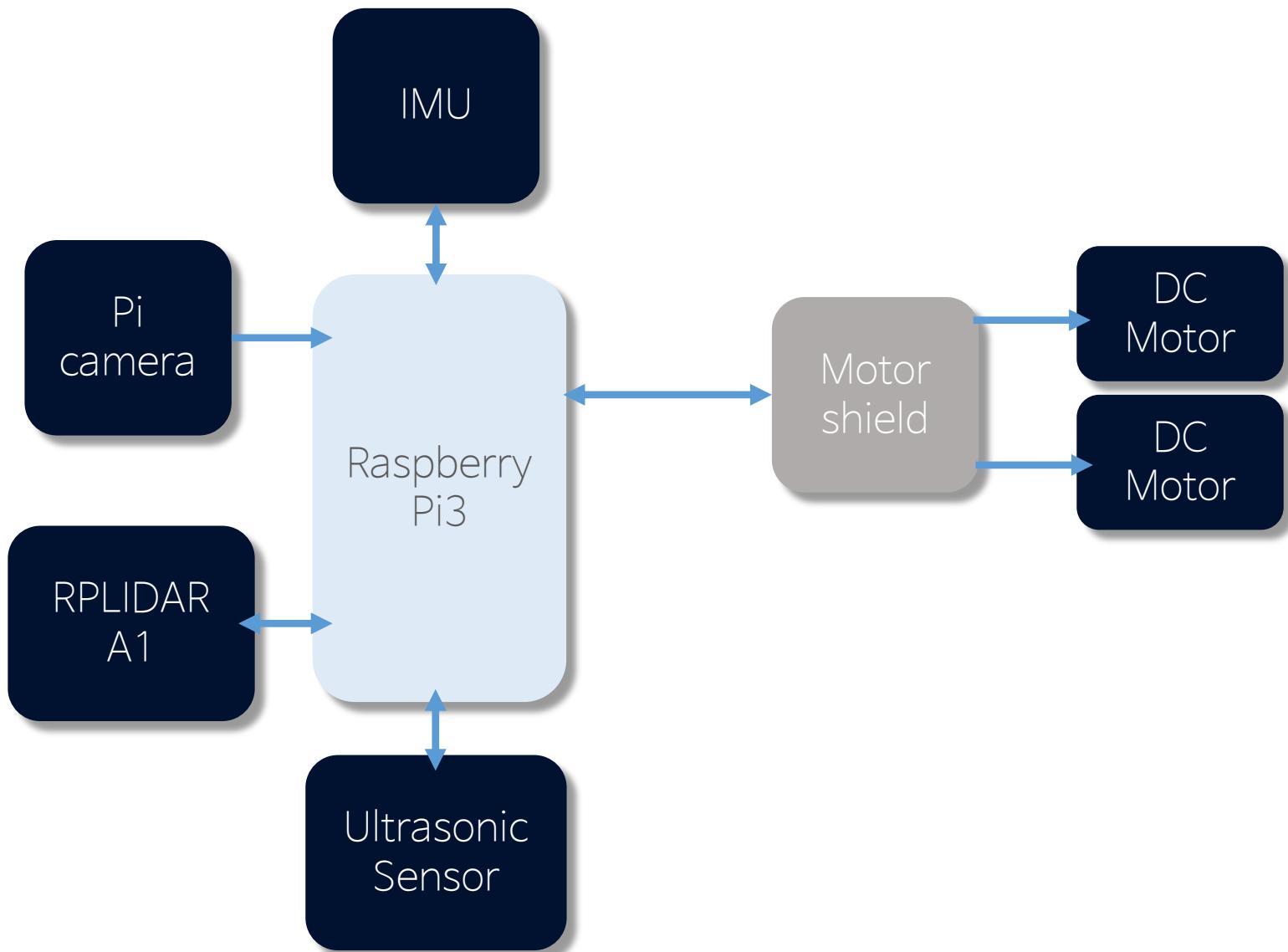


Created by Heidi Davodpour
from Noun Project

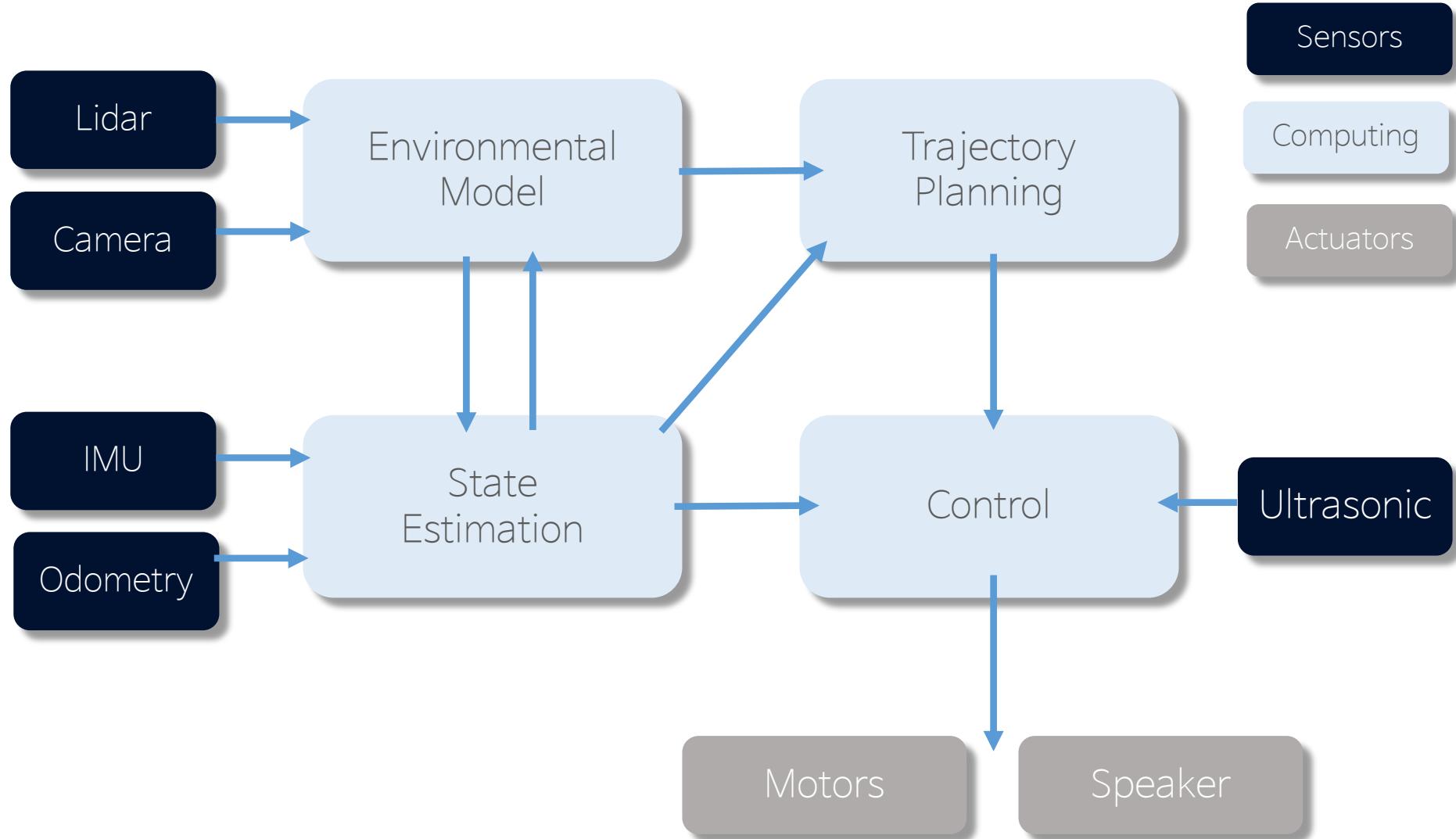


Created by Heidi Davodpour
from Noun Project

| 시스템 설계 - HW구성도

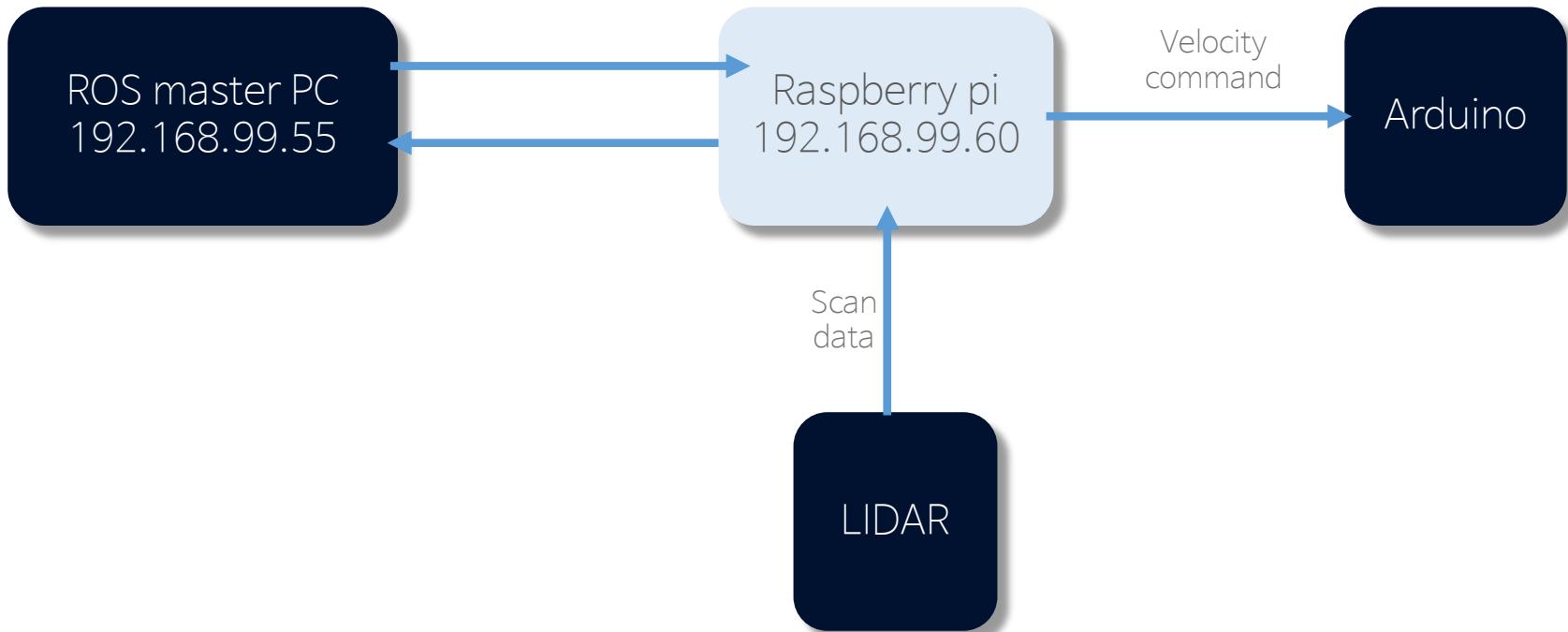


| 시스템 설계 - SW구성도





| 시스템 설계 - Network구성도



시스템 설계 - ROS



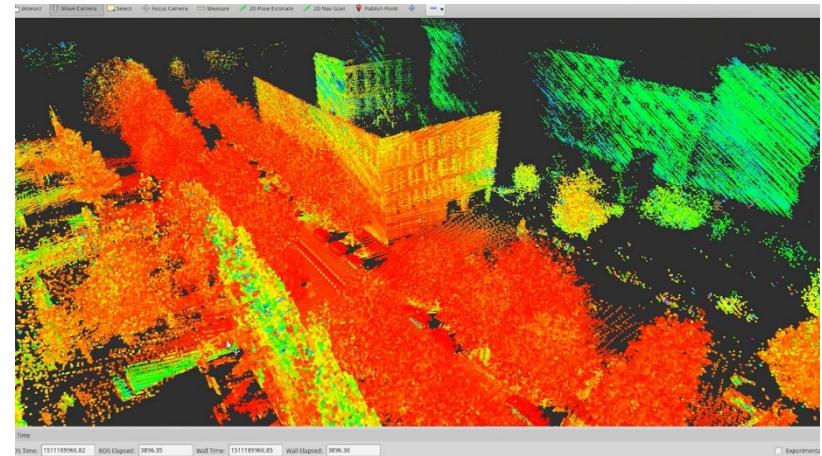
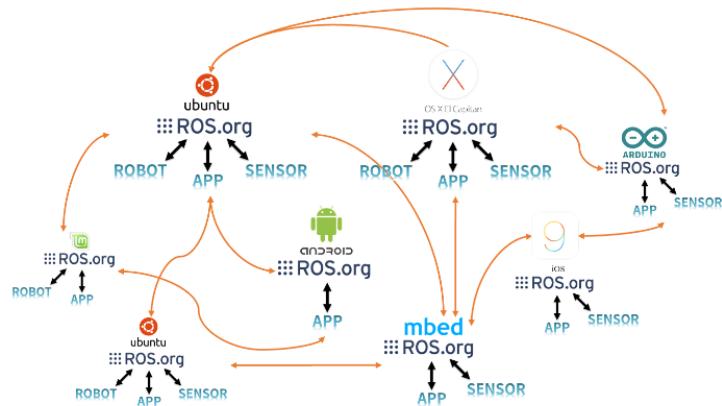
ROS

(Robot operation SYstem)

로봇 소프트웨어를 개발하기 위한 소프트웨어 프레임워크

다른 기종 디바이스간의 통신 지원

RVIZ





| 시스템 설계 - SLAM

SLAM
(Simultaneous
localization and mapping)

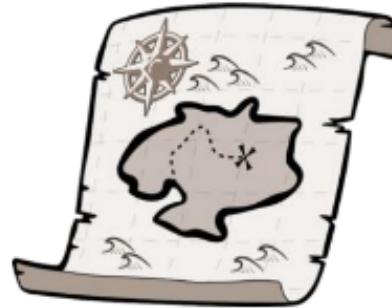
GPS신호가 달지 않는 실내 공간에서 위치를 측정할 수 있는 네비
게이션 기술로 실내에 동작하는 로봇에 필요



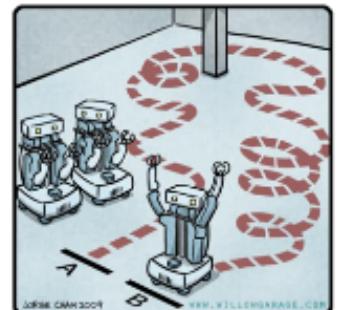
위치



센싱



지도



경로

$$\text{SLAM} = \text{위치} + \text{센싱}$$



| 진행상황 - 모터제어





진행상황 - 라이더 구동 및 맵 생성

slam.rviz - RViz

```
[INFO] [1553052966.352737811]: HectorSM p_base_frame_ : base_link
[INFO] [1553052966.352993177]: HectorSM p_map_frame_ : map
[INFO] [1553052966.353090729]: HectorSM p_odom_frame_ : base_link
[INFO] [1553052966.353163073]: HectorSM p_scan_topic_ : scan
[INFO] [1553052966.353232240]: HectorSM p_use_tf_scan_transformation_ : true
[INFO] [1553052966.353613857]: HectorSM p_pub_map_odom_transform_ : true
[INFO] [1553052966.353680888]: HectorSM p_scan_subscriber_queue_size_ : 5
[INFO] [1553052966.353817347]: HectorSM p_map_pub_period_ : 0.500000
[INFO] [1553052966.353817347]: HectorSM p_update_factor_free_ : 0.450000
[INFO] [1553052966.353887035]: HectorSM p_update_factor_occupied_ : 0.900000
[INFO] [1553052966.353957816]: HectorSM p_map_up_000
[INFO] [1553052966.354256880]: HectorSM p_map_up_
[INFO] [1553052966.354355422]: HectorSM p_laser_
libEGL warning: DRI3: failed to query the version
libEGL warning: DRI2: failed to authenticate
RPLIDAR S/N: ABD39AF2C1EA9FC0BEB9CF324003200
Firmware Ver: 1.25
Hardware Rev: 5
RPLidar health status : 0
QXcbConnection: XCB error: 1 (BadRequest), sequence major code: 154 (Unknown), minor code: 1
roscore http://localhost:11311/
Press Ctrl-C to interrupt
Done checking log file disk usage. Usage is <1GB.
started rosrun server http://localhost:42563/
ros_comm version 1.12.14
SUMMARY
=====
PARAMETERS
 * /rosdistro: kinetic
 * /rosversion: 1.12.14
NODES
auto-starting new master
process[master]: started with pid [28764]
ROS_MASTER_URI=http://localhost:11311/
setting /run_id to 3e6cf5e-4abf-11e9-90e7-988385
process[rosout-1]: started with pid [28777]
started core service [/rosout]
```

vokoscreen 2.4.0

File Panels Help

Move Camera Interact Select 2D Pose Estimate 2D Nav Goal +

Displays

- Global Options
 - Fixed Frame
 - Background Color
 - Frame Rate
 - Default Light
- Global Status: Ok
 - Fixed Frame
 - Grid
- RPLidarLaserScan
 - Status: Ok
 - Topic: /scan
 - Unreliable
 - Selectable
 - Style: Squares
 - Size (m): 0.03
 - Alpha: 1
 - Decay Time: 0
 - Position Transformer: XYZ
 - Color Transformer: AxisColor
 - Queue Size: 1000
 - Axis: Z
 - Autocompute Value Bo...
 - Use Fixed Frame

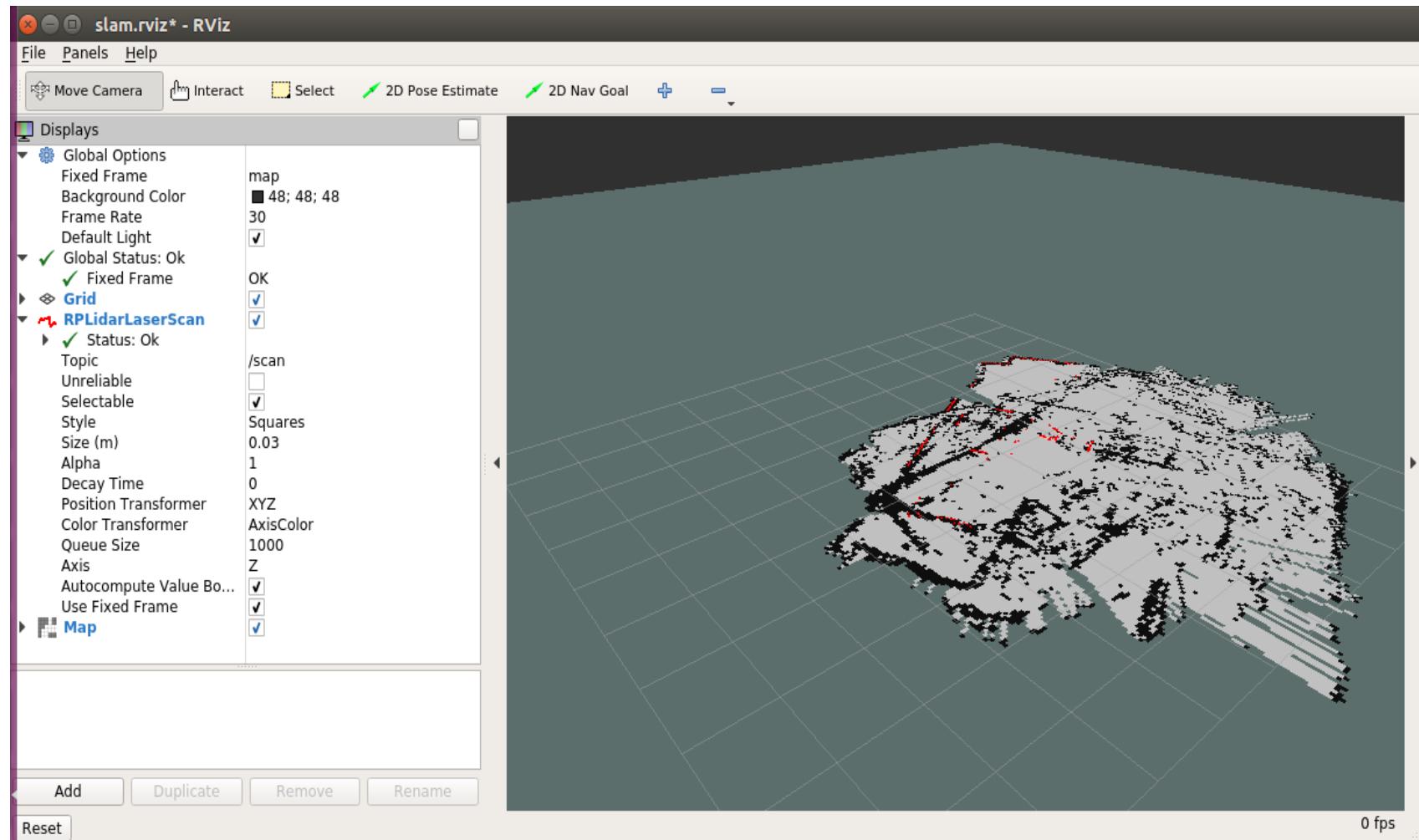
Add Duplicate Remove Rename

0 fps

```
return self._i2c.writeto(address, buffer, stop=stop)
File "/usr/local/lib/python3.5/dist-packages/adafruit_blinka/microcontroller/generic_linux/i2c.py", line 38, in writeto
    self._i2c.bus.write_bytes(address, buffer[start:end])
File "/usr/local/lib/python3.5/dist-packages/Adafruit_PureIO/smbus.py", line 244, in write_bytes
    self._device.write(buf)
OSError: [Errno 5] Input/output error
chuck@chuck-desktop:~/motor$
```



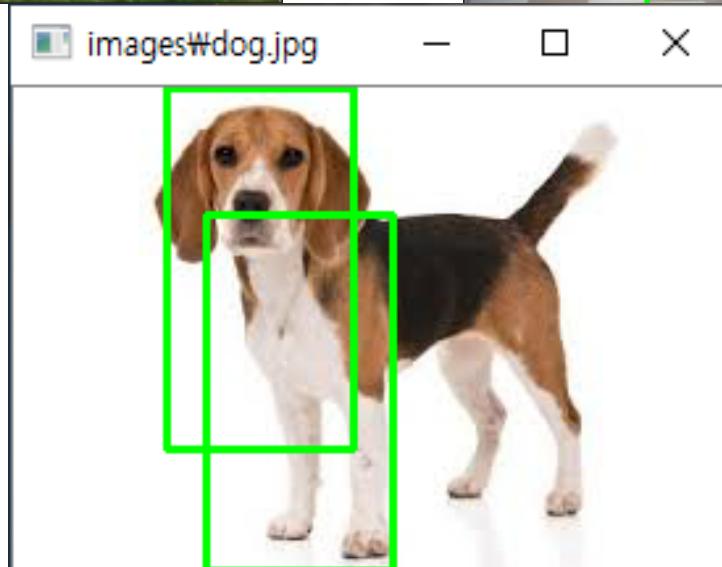
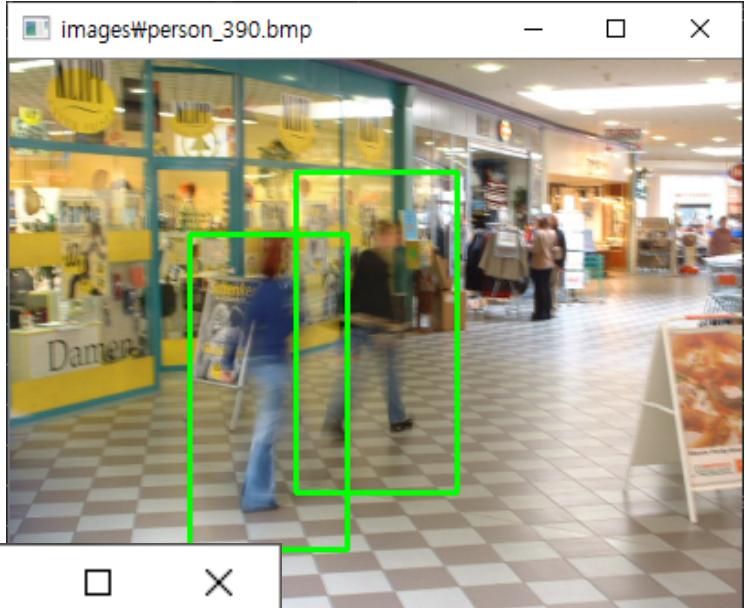
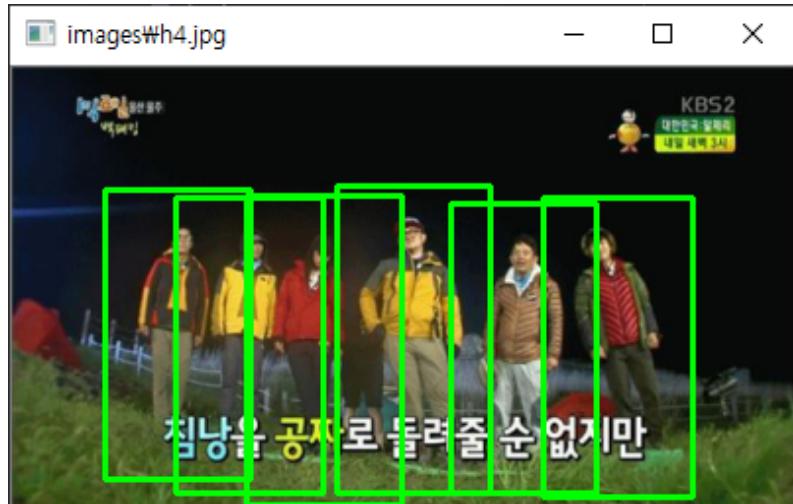
진행상황 - 라이더 구동 및 맵 생성



문제상황



| 진행상황 - 사물인식





4월

1. ROS기반통신
2. 로봇 모터 제어 완료
3. 자율주행 학습



감사합니다