Basic Training
LIMO

Confidential

www.WestonRobot.com

Agenda

01
Main Components

02
Basic Operations

03
Development

Main Components

What's in the box

LIMO

Mecanum Wheels

Rubber Track

Screw Box

Charger

Box Key

Allen Driver

Quick Start Guide

LIMO

Weston Robot

- Voice Module
- WiFi
- Infrared Camera
- 7" Touch Screen Display
- NVIDIA Jetson NANO
- Wheel-Motor Integration
- LiDAR
- One Key Switch
- Light Indicator
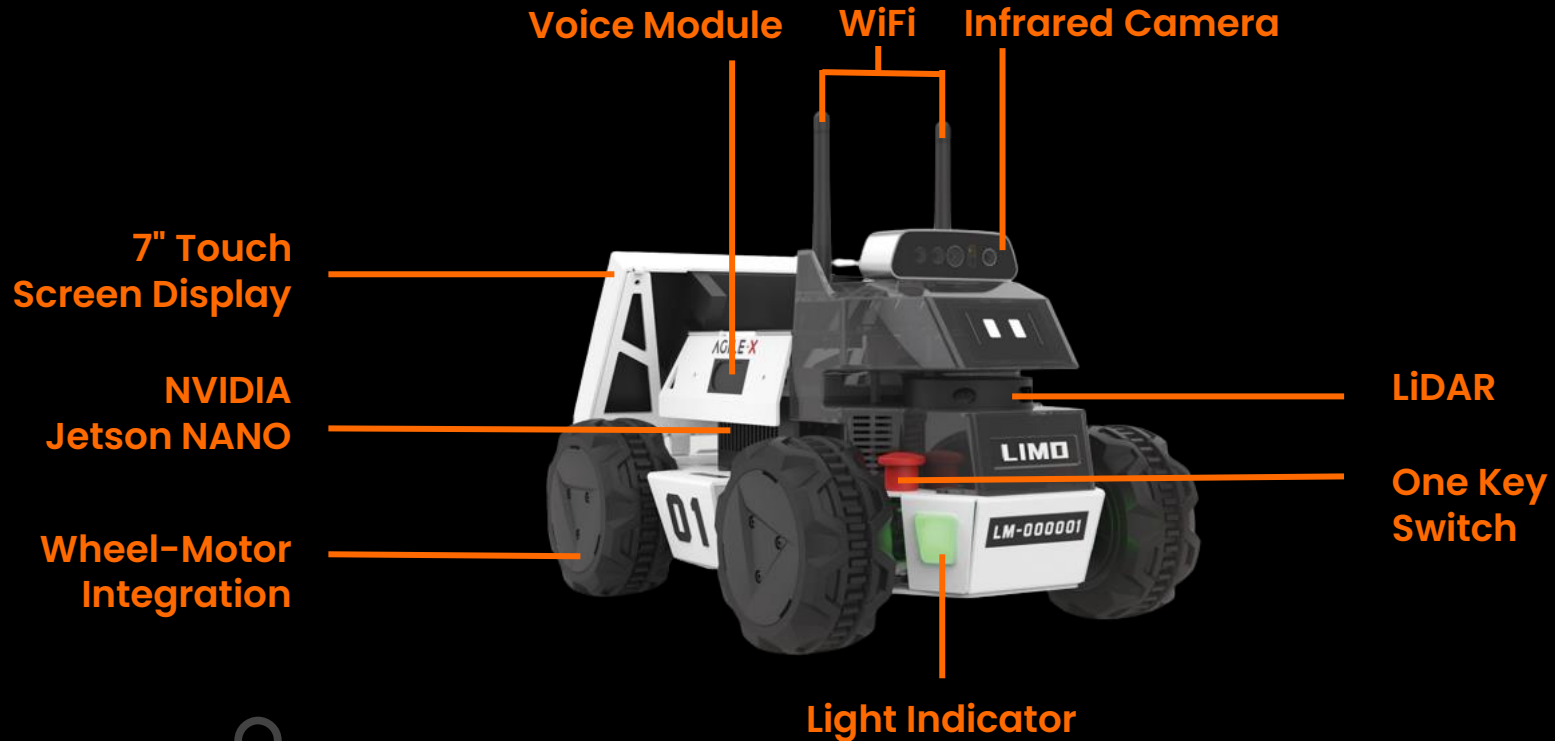
Basic Operations

Types of Mode

Ackermann Mode
A geometry designed to solve the problem of wheels on the inside and outside of a turn needing to trace out circles of different radii in the steering of vehicles.

Track Mode
It has good off-road performance and can climb 40° slopes and small steps

Types of Mode

Mecanum Wheel Mode
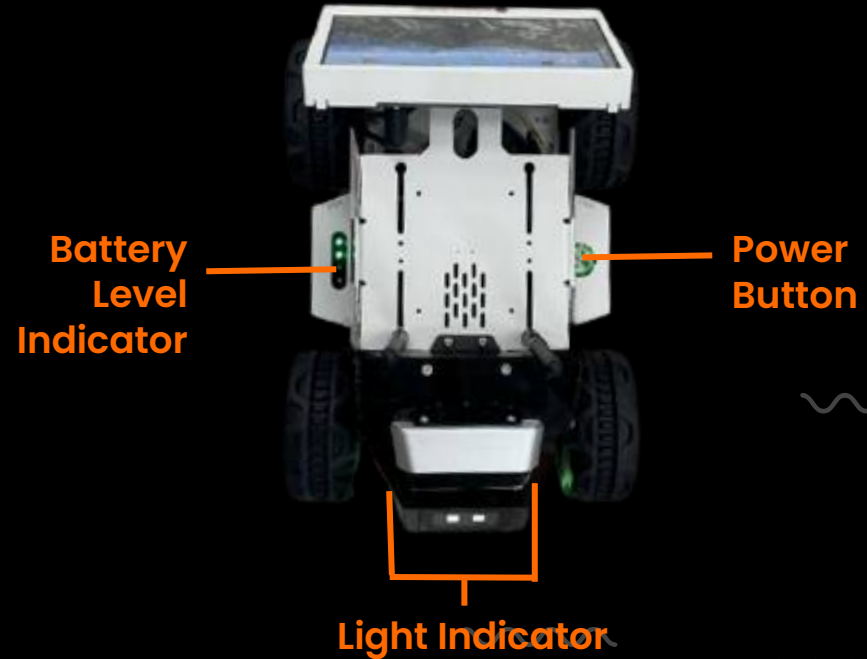The omni-directional motion equipment based on Mecanum wheel technology can realize forward, lateral, oblique, rotation and combinations of motion modes.

Four-Wheel Differential Mode
Four-wheel drive, which can realize on the spot auto-rotation, but it will cause serious tire wear; please do not auto-rotate on the spot for a long time

Switching On the Robot

- ## How to
  - ○ Do a long press on the power button

- ## Light Indicator

Color	Status
Red flashing	Low battery/master control alarm
Red	Software shut down
Green	Ackermann mode
Yellow	Four-wheel differential/track mode
Blue	Mecanum wheel mode

Battery Level Indicator

Power Button

Light Indicator

Download AgileX App

iOS

Android

AgileX App

Weston Robot

Bluetooth Signal

Drive Mode Switch

On/Off Controller

Ackermann | 4wd | Mecanum

ON

Setting

Left stick sensitivity — 100

Right stick sensitivity — 100

Ackerman steering calibration — Return 0 — − 0 + Verify

Bluetooth

Rename your device — Random — LM-000089 — OK
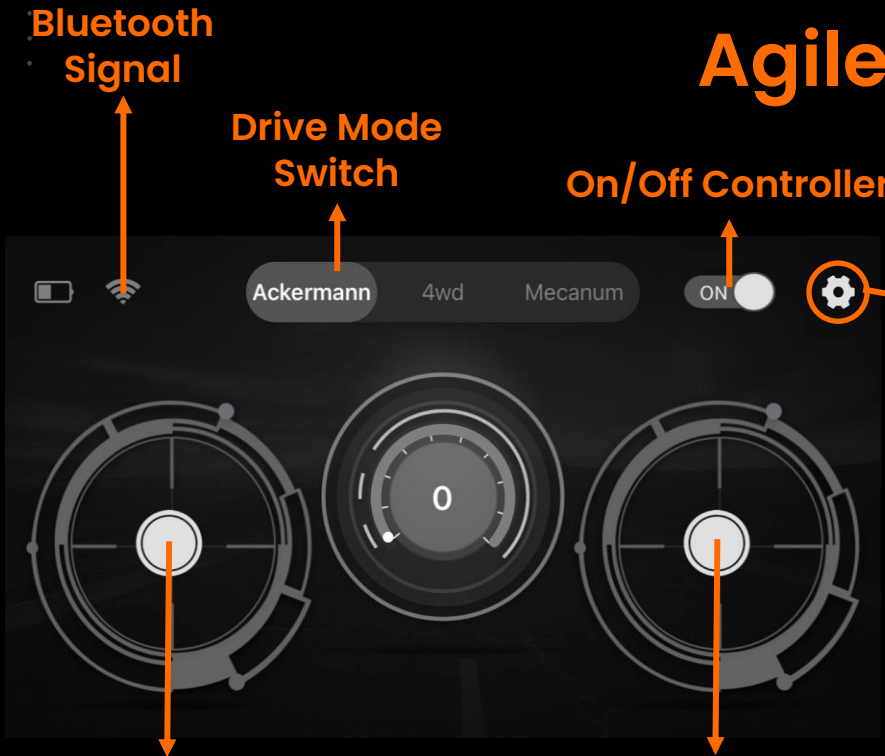
Motion Control

Direction Control

Weston Robot
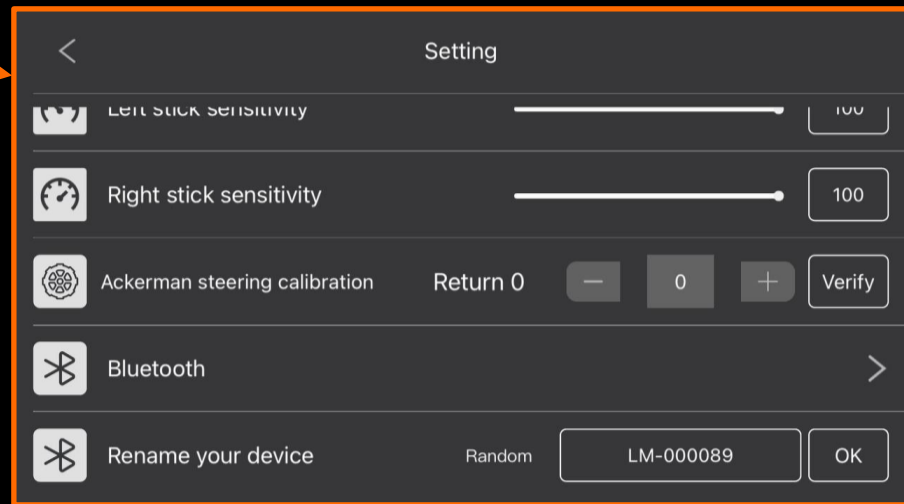
Development

Power Supply Topology
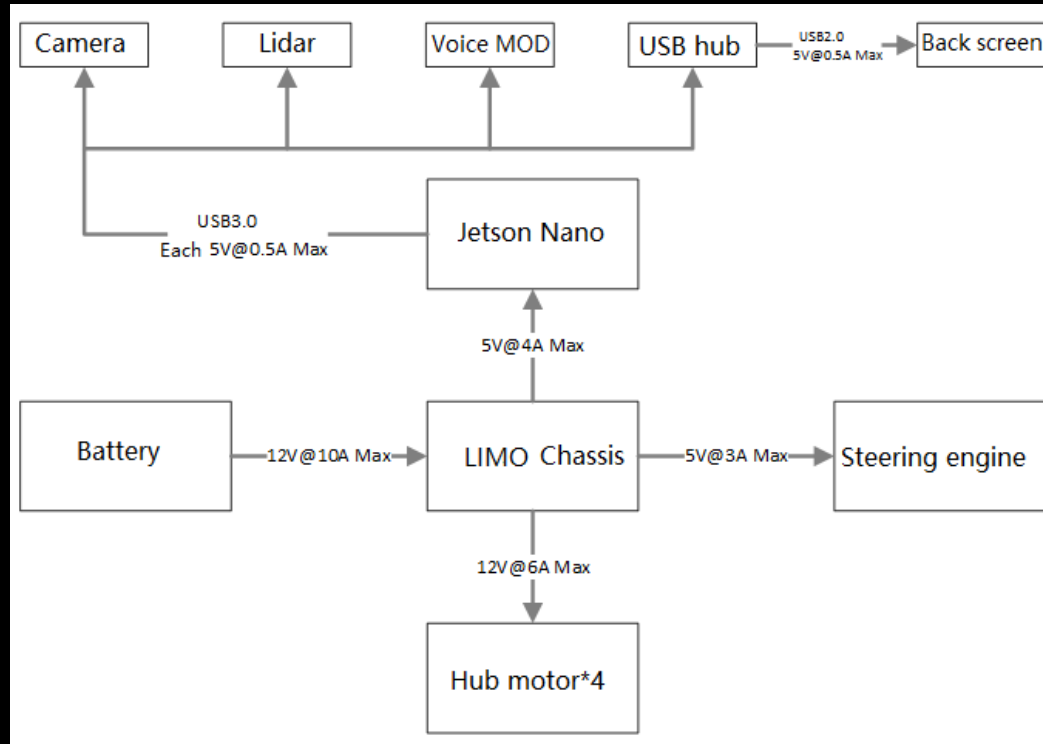
Communication Topology
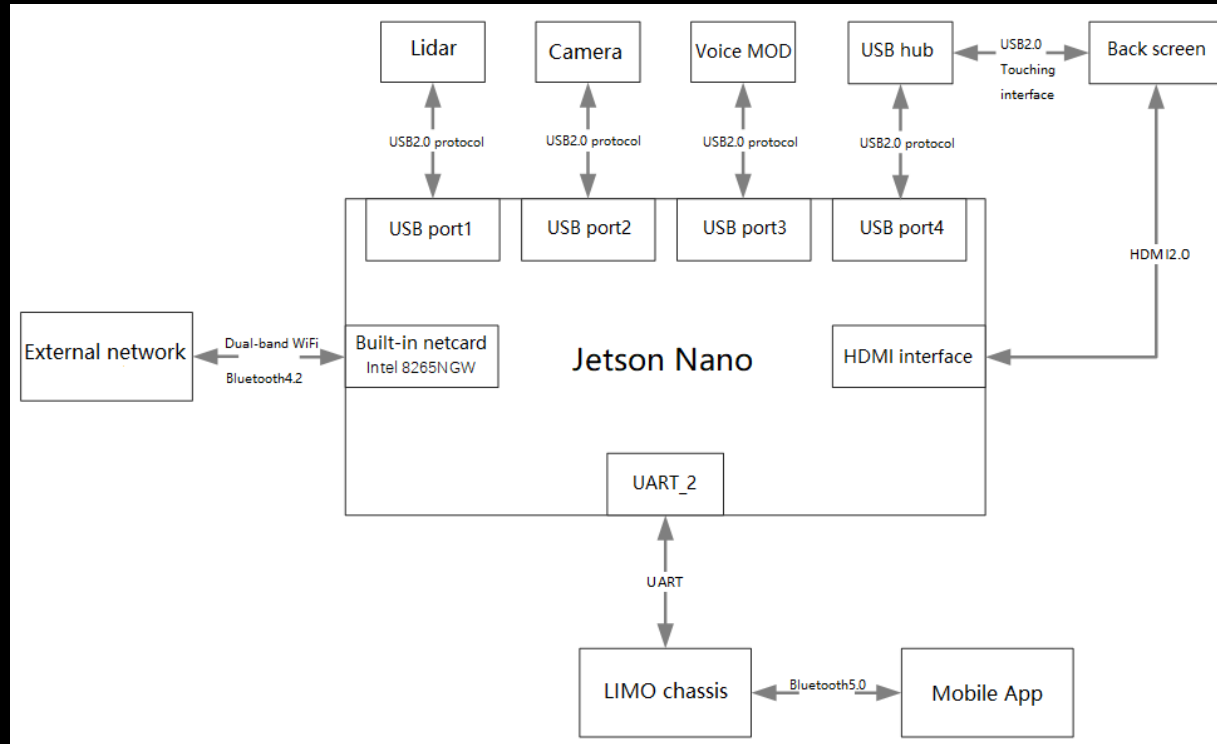
Remote Desktop Connection

- Download and install NoMachine
  - https://www.nomachine.com/download

- Connect to same Wi-Fi on LIMO and Computer

- Start connection
  - Select limo
  - Username: agilex
  - Password: agx
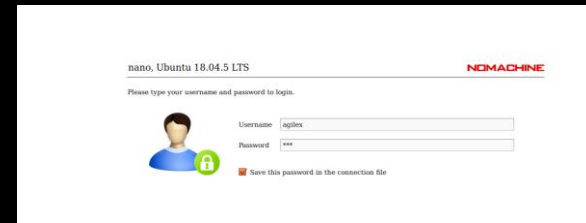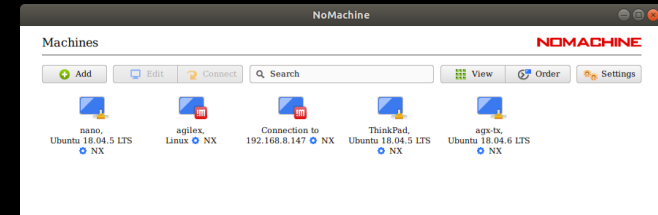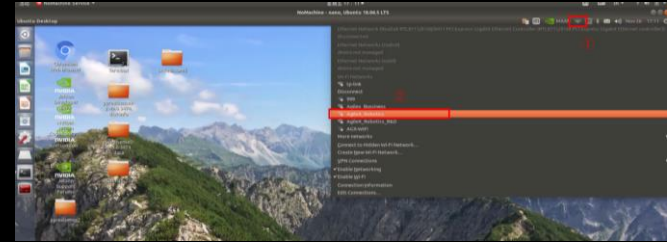
Use of LiDAR (RVIZ)

- Commands
  - roslaunch limo_bringup limo_start.launch pub_odom_tf:=false

  - roslaunch limo_bringup lidar_rviz.launch

LiDAR Mapping (GMapping)

- Commands
  - roslaunch limo_bringup limo_start.launch pub_odom_tf:=false

  - roslaunch limo_bringup limo_gmapping.launch
- Save Map
  - cd ~/agilex_ws/src/limo_ros/limo_bringup/maps/

  - rosrun map_server map_saver –f map1
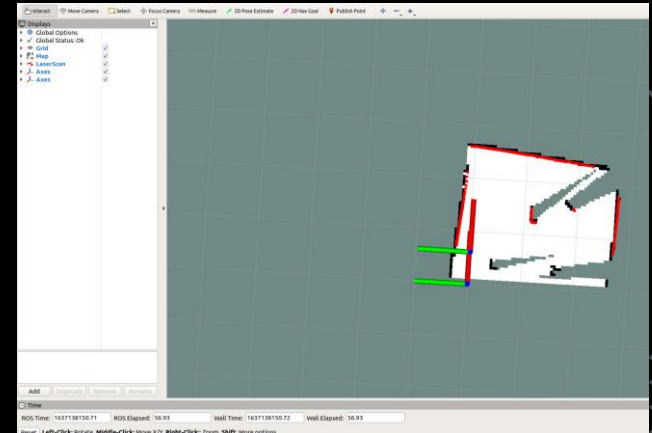
LiDAR Mapping (Cartographer)

- Commands
  - roslaunch limo_bringup limo_start.launch pub_odom_tf:=false

  - roslaunch limo_bringup limo_cartographer.launch

- Save Map
  - rosservice call /finish_trajectory 0

  - rosservice call /write_state "{filename: '${HOME}/agilex_ws/src/limo_ros/limo_bringup/maps/mymap.pbstream'}"

  - rosrun cartographer_ros cartographer_pbstream_to_ros_map -map_filestem=${HOME}/agilex_ws/src/limo_ros/limo_bringup/maps/mymap.pbstream -pbstream_filename=${HOME}/agilex_ws/src/limo_ros/limo_bringup/maps/mymap.pbstream -resolution=0.05
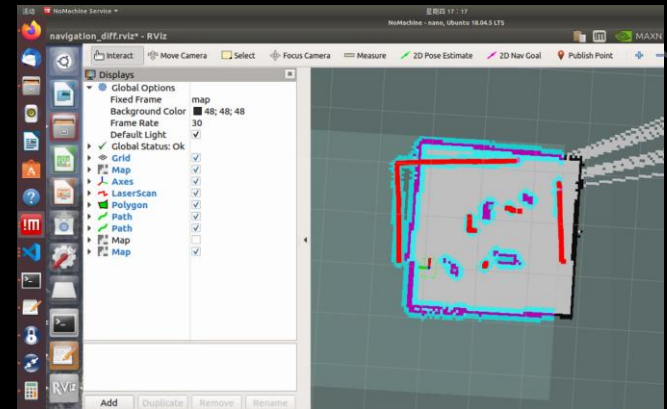
Navigation Framework

Navigation

- Bringup LIMO
  - roslaunch limo_bringup limo_start.launch pub_odom_tf:=false

- Launch Differential Mode Navigation
  - roslaunch limo_bringup limo_navigation_diff.launch

- Launch Ackermann Mode Navigation
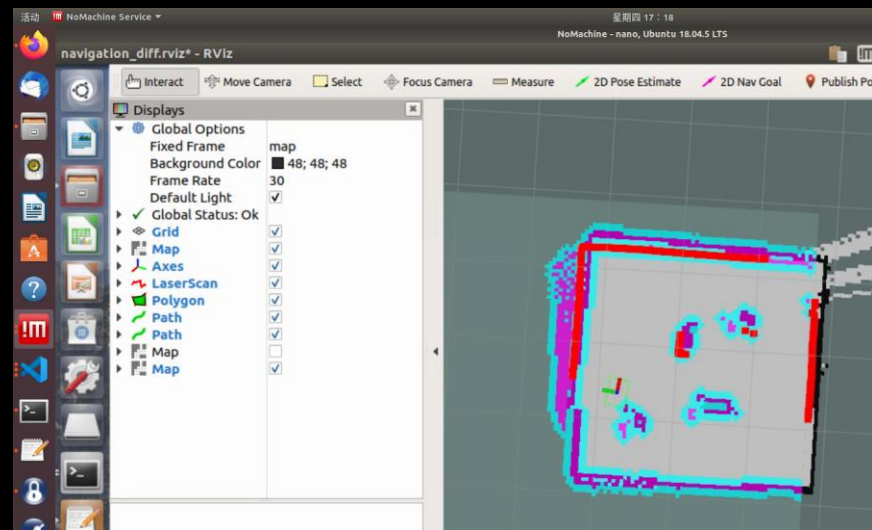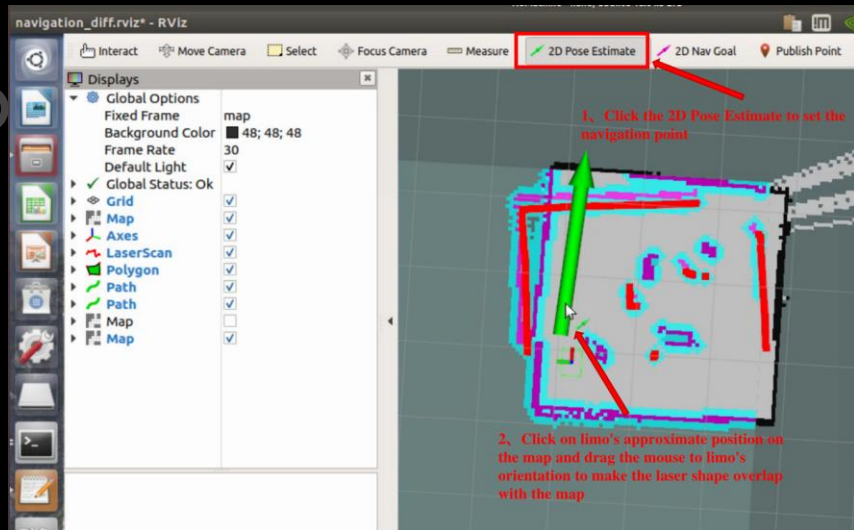 - roslaunch limo_bringup limo_navigation_ackerman.launch

Navigation Map

- Please modify map02 to the name of the map that needs to be replaced
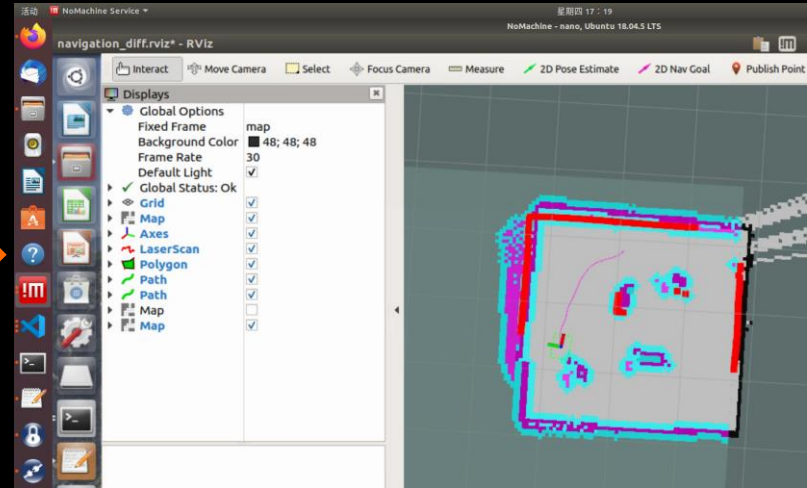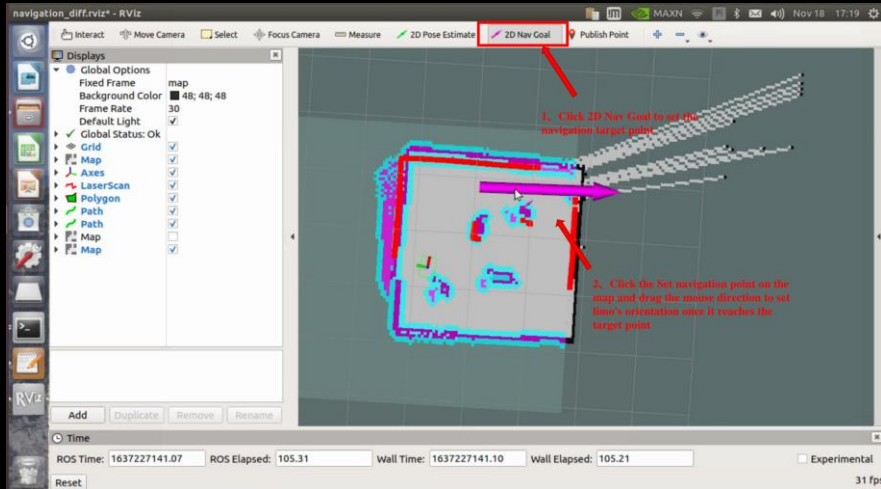
Correct Position in RVIZ

- Correct the actual position of the chassis in the scene on the map displayed in rviz
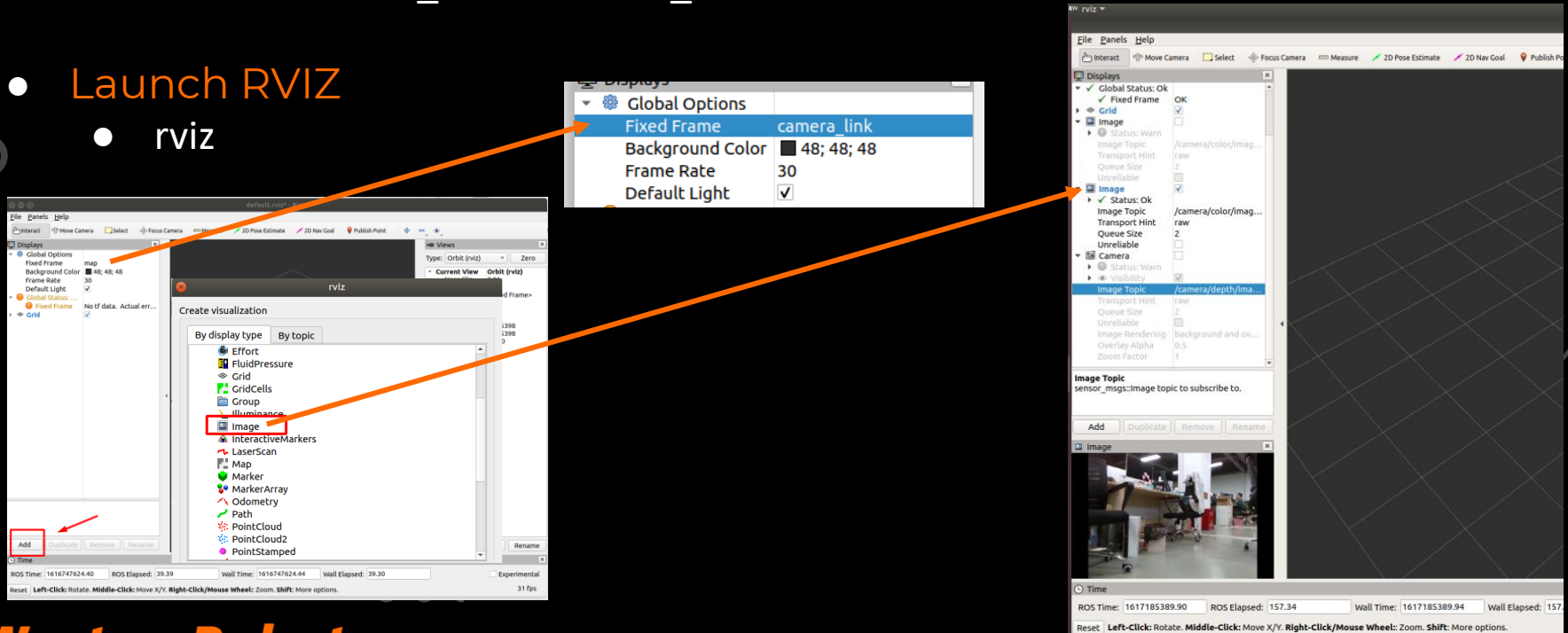
Set Navigation Goal

- Set the navigation goal point through 2D Nav Goal.
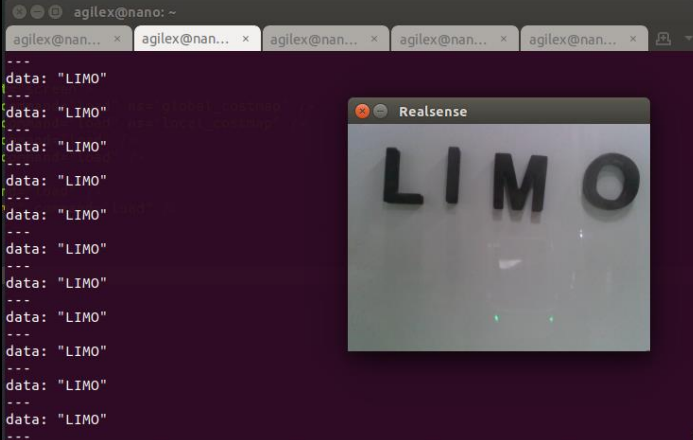
Vision Module

- ## Launch Camera
  - roslaunch astra_camera dabai_u3.launch

- ## Launch RVIZ
  - rviz

Text Recognition

Note: Before running the command, please make sure that the programs in other terminals have been terminated. The termination command is: Ctrl+c.

- Run roscore
  - roscore

- Start text recognition function
  - rosrun vision detect_node.py

- Execute rostopic echo /detect_word_result to view the recognized results
  - rostopic echo /detect_word_result

Identify Traffic Lights

Note: Before running the command, please make sure that the programs in other terminals have been terminated. The termination command is: Ctrl+c.

- Run camera
  - roslaunch astra_camera dabai_u3.launch

- Launch yolo_v3
  - roslaunch darknet_ros yolo_v3_tiny.launch

- Launch traffic light recognition function
  - roslaunch vision traffic_light_located.launch

Identify Traffic Lights

Note: Before running the command, please make sure that the programs in other terminals have been terminated. The termination command is: Ctrl+c.
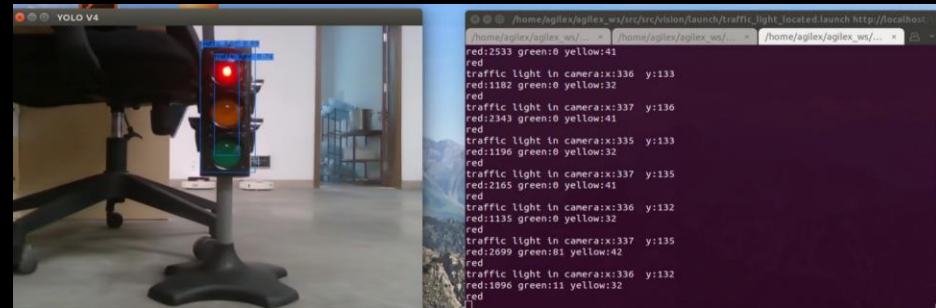
- Run camera
  - roslaunch astra_camera dabai_u3.launch

- Launch yolo_v3
  - roslaunch darknet_ros yolo_v3_tiny.launch

- Launch traffic light recognition function
  - roslaunch vision traffic_light_located.launch

Voice Module

Note: Before running the command, please make sure that the programs in other terminals have been terminated. The termination command is: Ctrl+c.

- Enter the following command in the terminal. When "recording" appears in the terminal, start to record the voice. After 3 seconds, the recording is complete, and "Done" will appear on the terminal
  - rosrun voice demo_record_voice.py

- After the voice is recorded, enter the command in the terminal:
  - rosrun voice demo_voice2word.py output.wav

Voice Module

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Links

- LIMO User Manual

  https://github.com/agilexrobotics/limo-doc/blob/master/Limo%20user%20manual(EN).md

- LIMO Quick Start Guide

  https://github.com/agilexrobotics/limo-doc/blob/master/Limo%20Quick%20Start%20Guide%20%EF%BC%88APP%20%26%20Operations%EF%BC%89.pdf

  NoMachine Download

  https://www.nomachine.com/download