

LineDetection Simulation

项目基于[github地址](#)实现。

实验背景：Ubuntu18.04, Melodic

Dependency

turtlebot3相关配置安装与编译

```
mkdir -p ~/catkin_ws/src
cd ~/catkin_ws/src
git clone https://github.com/ROBOTIS-GIT/turtlebot3.git
git clone https://github.com/ROBOTIS-GIT/turtlebot3_simulations
git clone https://github.com/ROBOTIS-GIT/turtlebot3_msgs
cd ~/catkin_ws
catkin_make
```

OpenCV安装

[下载opencv3.4.13](#)，解压

```
cd opencv-3.4.13
mkdir build
# configure, generate即可
cmake-gui .. # optionally, 可修改CMAKE_INSTALL_PREFIX, 以改变安装位置, 适用于多版本opencv共存
make
sudo make install
```

Build

编译LineDetection

```
cd ~/catkin_ws/src
git clone https://github.com/sudrag/line_follower_turtlebot
cd ~/catkin_ws
catkin_make
```

optionally, 若想指定Opencv版本, 可在 `line_follower_turtlebot` 中修改 `CMakeLists.txt`

```
set(OpenCV_DIR ${your_opencv_dir}/share/OpenCV)
```

Modify

1. 修改gazebo_model的调用

```
cd ~/catkin_ws/src/turtlebot3_simulations/turtlebot3_gazebo/launch
gedit turtlebot3_empty_world.launch
```

改为如下代码：

```
<launch>
  <arg name="model" default="$(env TURTLEBOT3_MODEL)" doc="model type
[burger, waffle, waffle_pi]" />
  <arg name="x_pos" default="0.0" />
  <arg name="y_pos" default="0.0" />
  <arg name="z_pos" default="0.0" />
  <arg name="world_file" default="$(find
turtlebot3_gazebo)/worlds/empty.world" />

  <include file="$(find gazebo_ros)/launch/empty_world.launch">
    <arg name="world_name" value="$(arg world_file)" />
    <arg name="paused" value="false" />
    <arg name="use_sim_time" value="true" />
    <arg name="gui" value="true" />
    <arg name="headless" value="false" />
    <arg name="debug" value="false" />
  </include>

  <param name="robot_description" command="$(find xacro)/xacro --inorder
$(find turtlebot3_description)/urdf/turtlebot3_$(arg
model)_for_autorace.urdf.xacro" />

  <node pkg="gazebo_ros" type="spawn_model" name="spawn_urdf" args="-urdf
-model turtlebot3_$(arg model) -x $(arg x_pos) -y $(arg y_pos) -z $(arg
z_pos) -param robot_description" />
</launch>
```

2. 修改topic指向

```
cd ~/catkin_ws/src/line_follower_turtlebot/launch
gedit lf.launch
```

改为如下代码：

```
<launch>

<arg name = "StartRec" default = "false" />

<include
file = "$(find turtlebot3_gazebo)/launch/turtlebot3_empty_world.launch">
<arg name = "world_file" value = "$(find
line_follower_turtlebot)/Maps/lfm1.world" />
</include>
```

```

<!-- Detection node -->
<node pkg="line_follower_turtlebot" name="detection" type="detect"
  cwd="node" output="screen">
  <remap from="/camera/rgb/image_raw" to="/camera/image" />
</node>

<!-- Robot commands node -->
<node pkg="line_follower_turtlebot" name="Velocity" type="navig"
  cwd="node" output="screen">
  <remap from="/cmd_vel_mux/input/teleop" to="/cmd_vel" />
</node>

<node
  pkg = "roscbag"
  type = "record"
  name = "roscbag_record_all"
  respawn = "true"
  output = "screen"
  args = "-a -O BagFile -x /camera/(.*) "
  if = "$(arg StartRec)"
/>

</launch>

```

Run

在终端运行如下代码，或写入 `~/.bashrc` 永久有效

```

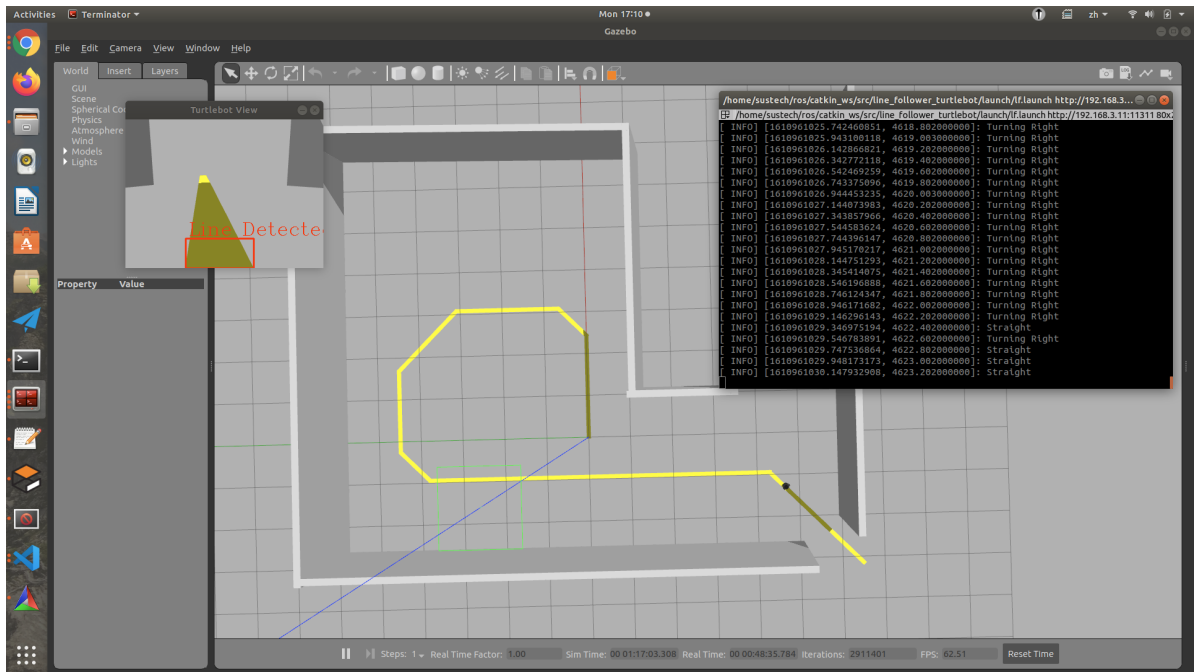
export TURTLEBOT3_MODEL=burger
source ~/catkin_ws/devel/setup.bash

```

运行：

```
roslaunch line_follower_turtlebot lf.launch
```

效果图：



话题关系图：

rqt_graph

