LiDAR.jl Documentation

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This is software for LiDAR model that is used to help navigate an a model of an autonomous ground vehicle.

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Installation on Ubuntu 16.04

1. `julia` programs needed

get and build:

```
Pkg.add("RobotOS")
Pkg.add("PyCall")
Pkg.build("RobotOS")
Pkg.build("PyCall")
```

2. Gazebo

Install:

```
curl -ssL http://get.gazebosim.org | sh
```

Run:

```
gazebo
```

More information is here

3. `ROS`

Follow the instructions here

Note: In step # 1.4, run this one (the full one seems to be broken):

```
sudo apt-get install ros-kinetic-desktop
```

4. Initialization of Package

4.1. Run `cmake .` and `make`

1. open another terminal -> `ctr``+``shift``+``t`

2. navigate to the folder `.scr/c_code`

3. in the terminal type `cmake .` and hit `enter`

4. in the terminal type `make` and hit `enter`

4.2. Set path for gazebo plugins

Not sure if this needs to be done:

A. in the terminal type (only should have to do during initialization):

```
export GAZEBO_PLUGIN_PATH=$HOME/gazebo_plugin_tutorial/build:$GAZEBO_PLUGIN_PATH

TODO: need to change path
```

4.3 Get the `velodyne_hdl32` model for `Gazebo`

Either:

1. Fork the gazebo_models database by visiting https://bitbucket.org/osrf/gazebo_models/fork.

OR

2. Just copy the folder `./LiDAR/scr/gazebo/gazebo_models` into `$HOME.gazebo/models/`

> **Note**
>
> press `ctr` + `h` to show hidden folders (..like .gazebo)

Potential Issues

1. running `using RobotOS` in `julia` -> fails

This may be due to path issues was fixed here.
- Additional info here
- NOTE: the following is designed for use with Ubuntu 16.04

Basic Usage

1. Start `roscore`

> **Background Information**
>
> **roscore is a collection of nodes and progams that are needed to use a ROS system.**
>
> - A roscore must be running for ROS nodes to talk
>
> **Linking GAZEBO to ROS**
>
> - GAZEBO can be linked to ROS using this link.
>
> **Linking ROS to julia**
>
> - ROS can be linked to julia using this package.

1. open a new terminal -> `ctr``+``alt``+``t`
2. in the terminal type `roscore` and hit `enter`

2. Make a ROS node in `python` that communicates to a `julia` node

1. open another terminal -> `ctr``+``shift``+``t`
2. navigate to the folder containing `echoinode.py` (i.e. `./scr`)
3. in the terminal type `python echonode.py` and hit `enter`

3. Run a `julia` function that can communicate with the `LiDAR` model

1. open another terminal -> `ctr``+``shift``+``t`
2. navigate to the folder containing `handler.jl` (i.e. `./scr`)
3. in the terminal type `julia` and hit `enter`

#. in the `julia` type:

```
include("handler.jl")
```

4. run `gazebo` model of the LiDAR

1. navigate to the folder `.scr/c_code`
2. in the terminal type `gazebo velodyne.world` and hit `enter`
 - A Gazebo gui should appear on the screen