Tutorial 5.1: The Robot Operating System: Rosbags

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Introduction

This tutorial covers data logging tools provided by the Robot Operating System. These tools allow users to capture data from various sensors and then play it back offline. This tutorial goes over some basic commands to utilise these logging tools. This should be ideally read after you go through the **T5 Sensor Integration Video**.

Rosbags: Tutorial 5.1

In this tutorial we are going to learn about **rosbags**. You would now know how dependant we are on the various sensors for testing and running our algorithms. The problem arises when we don't always have access to these sensors. **rosbag** is the tool provided by ROS that lets us log sensor data and play it back as per our need.

It stores this sensor data as the **topics** on which it was published and when the data is played back, its published again on those same topics. Therefore the remaining part of our system need not change when we need to test anything ofline.

You could go ahead and download the files located at (GIT LINK) These are essentially bags of a couple of different sensors - the LIDAR, the IMU.

In a terminal after initialising **roscore** run this command,

```
$ rosbag play lidarBag.bag − −clock
```

This **.bag** file contains the data from our LIDAR. After this command, on another terminal, use rostopic list to verify that you are able to see the **/scan** topic. This is the topic that the LIDAR was publishing on when it was actually used. The **clock** arguement here is a very important paramter. It provides a simulated 'clock' for the ROS network. The data playing back from the bags would have time stamps highly offset from the current time. This discrepency in time between the incoming data and the rest of the system often leads to unpredictable and generally unwanted behaviour. For this reason, the **'clock'** is used - It provides all the ROS systems with a common time stamp - a simulated time stamp. If you perform a rostopic list in a terminal, you will see the /**clock** topic that is being published. The other subsystems of your ROS framework need to be told that they must follow the simulated time and not actual time. To do this we must set the ros parameter **use_sim_time** to **true**. To do this, run the following command on a terminal

```
$ rosparam set use_sim_time
```

To check the value of the paramter use,

```
$ rosparam get use_sim_time
```

Ensure this configuration of use_sim_time every time you playback a bag.

Now we will go through the process of actually taking recording a bag. Lets use the Hokuyo and the IMU as our sensors. Launch the sensors using,

```
$ rosrun hokuyo_node hokuyo_node
$ roslaunch razor imu_launch
```

For bagging all current topics, use the **-a** command line argument with the command

```
$ rosbag record −a
```

You can choose to terminate the bagging process at any time by simply killing that process - **Ctrl + C** should do it. You will notice now that you will have a bag in your current folder. Use

```
$ rosbag <bag name>.bag info
```

to view the contents of the bag. This data can be then played with the command shown earlier to simulate the LIDAR data ofline.

Hopefully you guys understood the need and usefullness of the bagging process. This tutorial like the others was a very concise version of the Official tutorials on the ROS Wiki. Please visit [1] for more commands and options regarding the rosbag tool.

REFERENCES

[1] Rosbags Wiki⬀