

ROBOTICS RESEARCH GROUP

ROS is a meta-operating system which provides tools and libraries for developers. From robot's perspective, problems vary between instances of tasks and environments. Any individual institution can find it very hard to cope with these variations. ROS was designed specifically for groups (laboratories/institutions) to collaborate and build upon each other's work. While doing this project, I have learned roscore, roscd, roslaunch, rosnodetool, rostopic list commands and how to create a ros workspace.

V-Rep is a robotics simulator which is used to create application for a physical robot without depending on the actual machine. In V-Rep there are some sections called scene, plugin and script. Scenes are used for physical elements, scripts are used to move these physical elements according to a plan.

In experiment, first I installed every program and created a new workspace called new_catkin_ws. Using catkin_init_workspace, I initialized it as a workspace. I added two new modules into the src module and built it (In my previous trials, I had put these modules after building it so I encountered many errors.). After sourcing, I created a new module vrep_ros_interface using the git link. This is necessary for connecting V-Rep simulator to ROS. After building it again, I copied vrep-ros packages to my catkin space. I opened V-Rep and added Assignment1.ttt as a scene. But when I tried to roslaunch the base.launch, I had an error. So I ran roscd vrep_apps command, but it said: "No such package/stack..." So I went back to my workspace and sourced it again. After sourcing, roslaunch worked. I could control the robot with arrow buttons in that terminal and this means ROS and V-Rep can communicate, because I have focus on the terminal but the program in V-Rep is running. I opened a new terminal and inside my workspace I called rviz command. I added a robot model but an error occurred there. But I added TF and selected "world" in the bar of fixed frame. The error remained still but there were arrows and when I used the arrow keys on terminal, the arrows on rviz were moving.

Simulators are used commonly in robotic tasks. Because, simulation does not depend on a physical, actual machine. So it is faster than testing on a actual robot. Also it can be used when the actual system is not available. It shows when an application is not efficient. It allows testing every possible fault, so that the actual machine can change before manufacturing. But the simulation may not be totally accurate because of the environmental variables.

<https://drive.google.com/open?id=1tab82c6rg0DEia-9mnojYp7ALZzreBH->

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