1. Assignment, Introduction to Robotics WS16/17

Prof. Daniel Göhring, Zahra Boroujeni

Institut für Informatik, Freie Universität Berlin

Submission: online until Tuesday, 08 Nov 2016, 11:59 a.m.

Please summarize your results (images and descriptions) in a pdf-document and name it "RO-01-<surnames of the students - group name>.pdf". There should not be any source code in the pdf document.
By the end of this class you will need 50% of points to be allowed to write the final exam.

1. Installation (2 Points):

Install the ROS-Kinect package, together with Ubuntu 16.04 LTS 64 bit. Therefore, the tutorial can be found under: http://wiki.ros.org/kinetic

To get a basic understanding of the basic concepts in ROS, read the subsection 1-5 of the tutorial: http://wiki.ros.org/ROS/Tutorials

Start a console and execute roscore, make a screenshot of the console output and include the image into the pdf-document to be handed in.

Hint #1: the console tool "terminator" has been very helpful in the past for many ROS-developers, since it allows to open and manage different terminals in parallel. Be sure to set the necessary environment variables in every window, or just include the necessary variable settings in your .bashrc-file.

Hint #2: For programming tasks in later assignments the recommended IDE from us is qtcreator. You can install it easily by: sudo apt install qtcreator , or download an even newer version online.

2. Finding a group and time slot for robot time (2 Points):

All students should be members of groups with three group members each, ideally not more and not less than three.
Use the online doodle-poll until Sunday, 30 Oct, 11:59 p.m.
http://doodle.com/poll/rwmm8xbdsrgy84v7#table

to find a free time slot. The idea is that you and your group members will all sign up for a free time slot.

Question: "I only have one group member, what shall I do?"
Answer: "Groups with two people, sign up with your group member until Thursday, 27 Oct, 11:59 p.m. - a person without a partner will be allowed to join"

Question: "I don't have any group partner."
Answer: "You can join another group with 2 people or create your own group until Thursday, 27 Oct, 11:59 p.m., other people can join your group".

Question: "That's so exciting! Can't we start working on the robot earlier?"
Answer: "If you are a group of three and find a free time slot, you can start working with the robot this week already."

Question: Where is the lab where the model car is to be found?:
Answer: Arnimallee 7, Robotiklabor Raum E020

Since we have never done this group assignment strategy before, don't expect this strategy to be perfect. If necessary, improvise.

As a hand in, write your group name, group members and time slot you found into the pdf.

3. Data recording from the robot model car (6 Points):

Record a camera image of the robot model car, as the image is seen in the robot data visualization tool "rviz"

Go to the tutorial for the model car:

https://github.com/AutoModelCar/AutoModelCarWiki/wiki

To communicate with the car, it mainly boils down to the following steps, where you have to change some environment variables for ROS:
https://github.com/AutoModelCar/AutoModelCarWiki/wiki/MultipleMachines
Perform the following steps in your console:

- export ROS_MASTER_URI=http:// ip of the target machine, followed by port number :11311
- export ROS_IP= ip of the local machine
- export ROS_HOSTNAME= ip of the local machine

Use the command "rostopic list", you should see a list of topics, coming from the car now.

Start rviz to visualize the car camera data as shown in the tutorial.
- Run rviz (type "rviz" in terminal)
- click add button (bottom left)
- Click on "By topic" tab
- Select app/camera/rgb/image_raw/Image

Let the car camera face the members of your group and take a screen shot of the camera image in rviz. Include this image in your final pdf. You can also take a picture of something (not somebody without asking) else in the robot room.
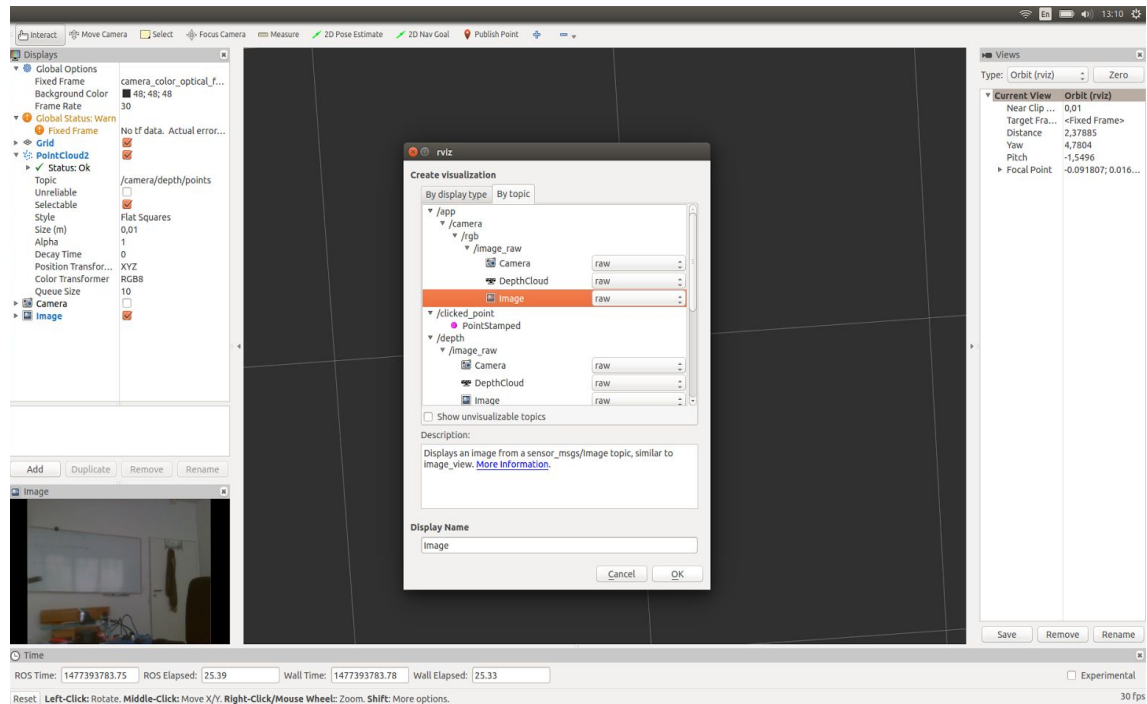
Pic1: Rviz environment, click add, select By topic tab, app/camera/rgb/image_raw/Image