Robotics-Lab

Exercise Sheet

Due: Tuesday, November 8th, 2011

Exercise 1 (ROS Introduction)
Setup a working ROS system on your computer or obtain an account for the lab machines.
If there is a Python and C++ tutorial for the same task, you can skip the Python tutorial.
For a better understanding the start guide at http://www.ros.org/wiki/ROS/StartGuide might be helpful, especially the Concepts section.

Exercise 2 (TF Introduction)
Follow the tutorials 1. - 3. for the TF library at http://www.ros.org/wiki/tf/Tutorials. If there is a Python and C++ tutorial for the same task, you can skip the Python tutorial.

Exercise 3 (Sample Messages)
Create a new ROS package for a sample project and define a new custom message for your project:
Project 1: First define a MatchedFeature message that describes a feature as image coordinates in the original image and the matched image. The define a MatchedFeatureList that should contain a vector of MatchedFeatures.
Project 2: First define a Line message containing start and endpoint using geometry_msgs/Point. Then define a LineList message that should contain a vector of lines.
Project 3: Define a custom message ImuAndHeight that contains a sensor_msgs/Imu and a height with covariance. Choose appropriate types for height and its covariance.

Exercise 4 (Sample Package)
(a) In the previously created package create a simple library that only has one function process() that returns an instance of a message created in the previous task. The message should be filled with appropriate dummy values.

(b) Write an executable that uses the library to continuously (with 5 Hz) generate a message and publishes it to a topic.

(c) Write a subscriber that subscribes the message and outputs it as a warning to the ROS system.

The programming solutions should be submitted via eMail to dornhege@informatik.uni-freiburg.de on the day before the practical.