ROS-I Basic Training “Mobile Manipulation”

ROS Basic Tools

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Learning Objectives

You will learn

- the basics of the parameter server
- the basics about Transforms (TF)
- to handle the most important visualization (RVIZ) and analyzation (RQT tools
- the basics about Gazebo Simulator

ROS Parameter Server - I

- shared, multi-variate dictionary, accessible via network APIs
- Nodes store and retrieve parameters at runtime
- best used for static, non-binary data such as configuration parameters
- globally viewable

http://wiki.ros.org/Parameter%20Server

ROS Parameter Server - II

Example use case:

- robots description (URDF) is loaded onto the parameter server via launch file
- robot_state_publisher node generates *static* TFs (e.g. fixed parts)
- joint_state_publisher node generates *dynamic* TFs (e.g. joint positions)
- TFs can the be viewed by RVIZ or other analyse tools

http://wiki.ros.org/Parameter%20Server

Transforms (TF) - II

- array of geometry_msgs/TransformStamped messages
- topic is usually /tf or /tf2
- useful commands/tools:
  - rostopic info /tf
  - rostopic echo /tf
  - rosrun rqt_tf_tree rqt_tf_tree
  - rosrun rviz rviz

Transforms (TF) - II

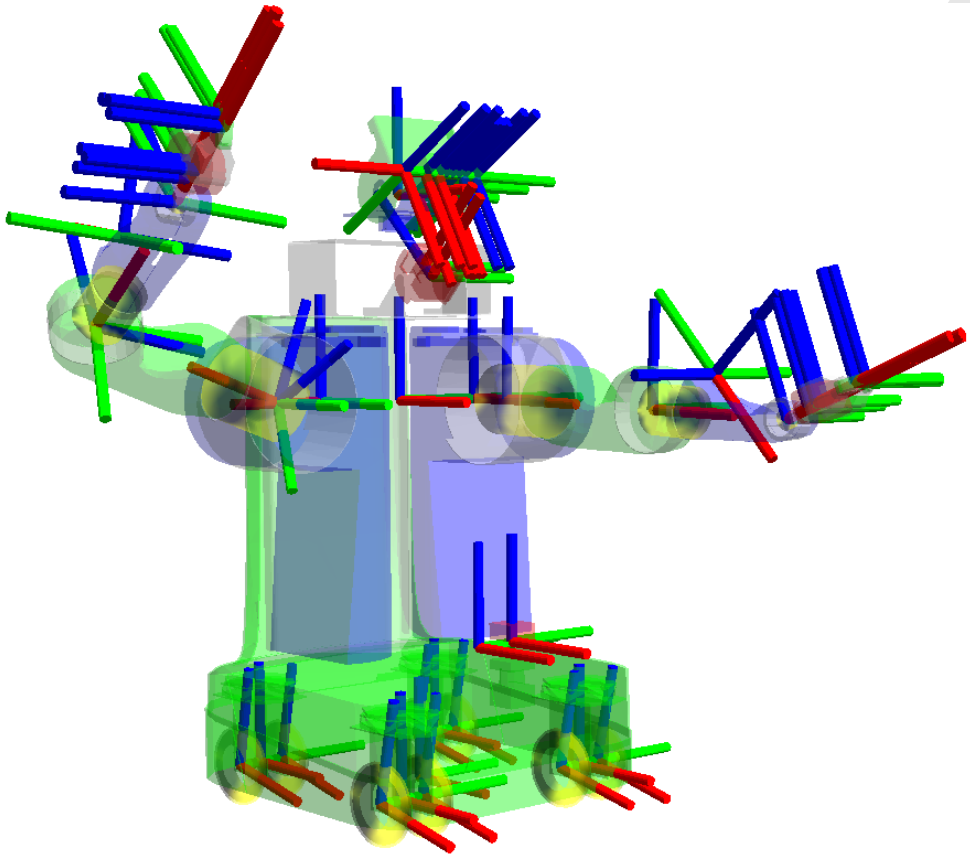

Figure: PR2 Transforms

Transforms (TF) - III

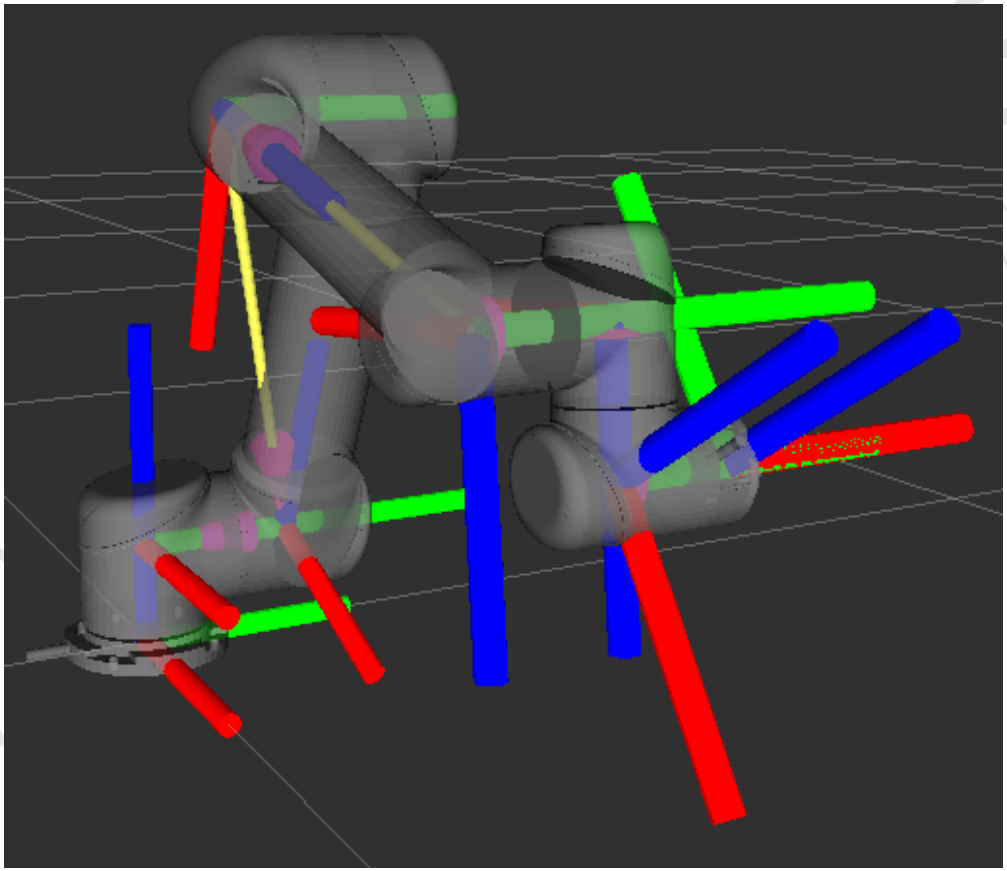

Figure: UR5 Transforms

RVIZ - I

RVIZ is one of the most important visualization tools

- build-in visualization for lots of robot data, such as:
  - odometry
  - laserscan
  - pointclouds
  - camera images (rgb, depth, disparity)
  - transforms
  - map
  - pose
  - etc...
- API for development of own visualization plug-ins

http://wiki.ros.org/rviz

RQT

RQT is a collection of important ROS tools for debugging or visualization, such as

- dynamic reconfigure
- data plot
- tf tree viewer
- joint trajectory planner
- introspection tools
- logging
- moveit
- service/action management
- and much more ...

http://wiki.ros.org/rqt

RVIZ / RQT

LIVE DEMO on Youbot / Youbot Simulation