Assignment 1

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What we did

In this assignment our plan was to create a virtual twin of a dual arm robot with grippers attached. The robotic system was composed of 2 SIA20D Motoman robots and the grippers were WSG50 parallel grippers. For the first part of the assignment our task was to create a Xacro file that includes two Motoman robots as the arms and the grippers that are attached to them. After configuring the Xacro we created the MoveIt configuration package for the robots and the grippers. In the MoveIt package the task was to create a motion group for both arms and both grippers and also for the dual-arm motion.

The robot itself can be launched with command *rosrun dual_arm_robot test_dual_arm_robot.launch* And with MoveIt with command *rosrun dual_arm_robot_moveit_config demo.launch*

Topics and nodes

In the rqt_graph (Figure 1) we can see that the digital twin of RVIZ utilizes a fake controller, due to our group not having real hardware. This fake controller inputs joint states to a ROS publisher node, that then forwards them to the kinematic member of the robot move group as well as another publisher node. The state publisher node allocates the correct robot positions to the move group using a transfer function, which then reinitializes the process. On top of this, there are two virtual broadcaster nodes to account for robot joint movement and improve accuracy. (Run *rostopic* from inside assignment files for more accurate ROS topic information.)

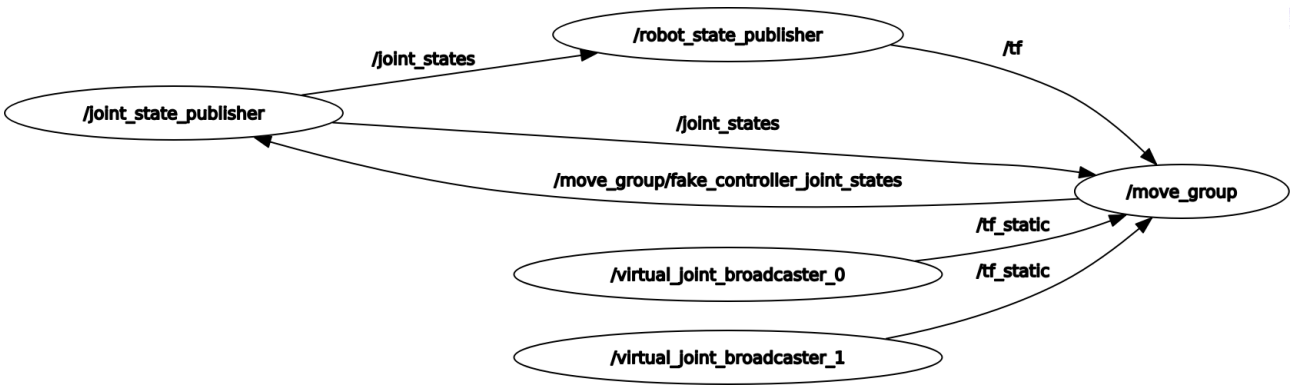

Figure 1: rqt_graph