PS5: trajectory messages

Request:

Modify the example trajectory action server and action client to control your 2-DOF robot.

Use rqt_plot to show the joint commands to your robot and use Kazaam to make a movie of your robot moving.Submit your plots, your movie and your modified trajectory action server and action client.

If you're ambitious, extend this to more joints!

Answer:

Fig.1 and *Fig.2* shows the model of my three_DOF_robot in rviz and in gazebo

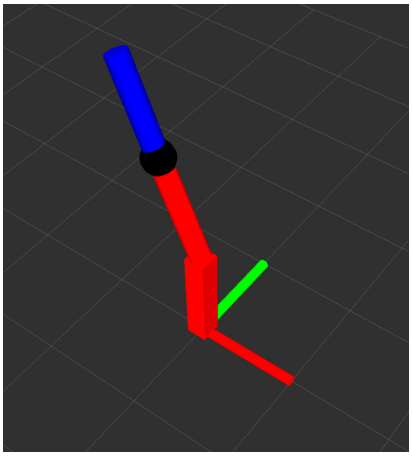

Fig.1

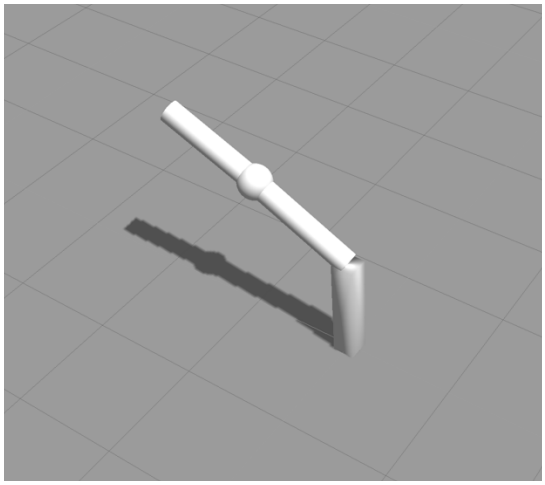

Fig.2

The model this time looks exactly the same as previous one, but the joint point have been totally changed, now it goes with 3 direction of freedom, the joint ball can spin which enable blue link to move in Z axis.

trajectory_controllor and trajectory_commander is modified from class example, now they can take any number of joint, just by changing two constant value.

trajectory_interface provide a simple way to send command to this robot. “shake” command will make blue joint lay horizontal with Z rotation (sending this command is very probability to cause trajectory_commander crash), “nod” command will keep Z axis still, and move the Y axis of other two joint simultaneously. “back” command will make the robot back to initial condition (all link horizontal).

Fig.3 and *Fig.4* shows the command output of trajectory_commander,we can see that after the calibration of trajectory_commander, the trajectory gets much more smooth.

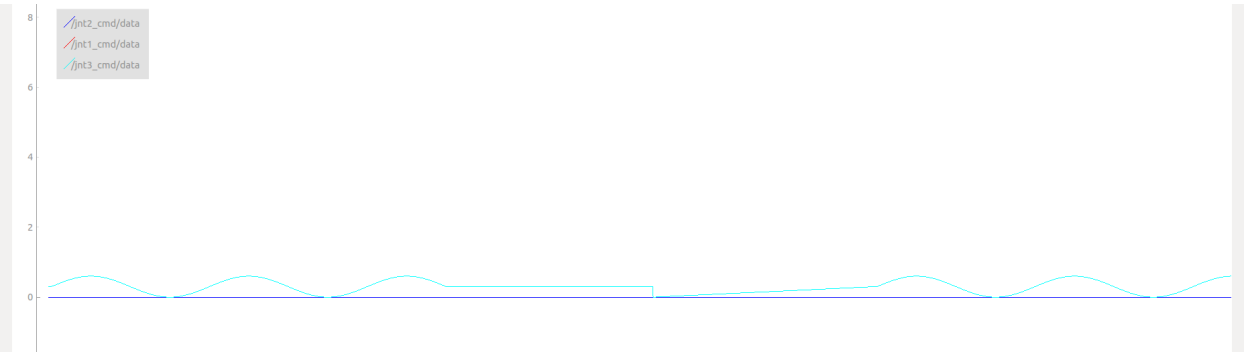

Fig.3

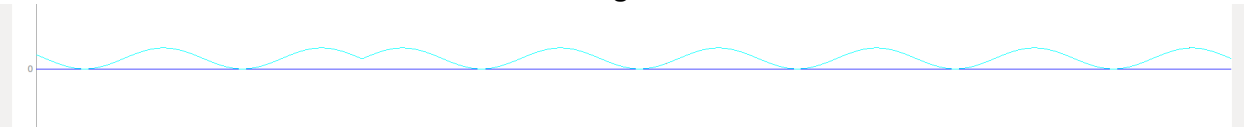

Fig.4

How to run:

1. unzip file robot_simulator@ps5.zip and put the folder into the src folder in your catkin workspace.
2. Compile the package using catkin_make with following command:

   ```
   cd (workspace_dir)
   catkin_make
   ```

3. Start roscore

   ```
   roscore
   ```

4. Start controller, commander and other essential nodes with roslaunch:

   ```
   roslaunch robot_simulator  trajectory_simulator.launch
   ```

5. Start trajectory_interface with rosrun:

   ```
   roslaunch robot_simulator trajectory_interface
   ```

6. Follow the instruction and start `rqt_plot` to see the effect.