

P5 Report: dgp34

In this project, a third joint was added to the robot from P4 and all joints were commanded to move at unique, hard-coded frequencies.

The values of the frequencies have been changed from P4. Additionally, the URDF has been changed to include limit and dynamics lines in all joints, transmission blocks for all joints, and a gazebo block to incorporate ROS controllers. There is also a controller configuration YAML file, in which PID settings have been listed for all joints.

In its default setup, the motion of the tip of the robot vaguely traces an infinity symbol on either side of the base, with an occasional but definitive sweep from one side to the other. If desired, the motion can be edited by going to `sin_commander.cpp` and editing the defined `FREQ1`, `FREQ2`, and `FREQ3` values. The motion can also be edited/fine-tuned by using `rqt_gui` with the dynamic reconfigure plugin to test PID values for all joints. Current settings have all values of PID set to 10, with I clamped between -10 and 10. New PID settings can be transferred to the YAML file for more permanent updates.

As a final note, the mass of each link has been changed to allow for total motion; various early configurations prevented joint 1 from moving.