

Schelbert Milestone 2 ReadMe

Introduction:

This README serves as a file to instruct the user on how to properly produce a trajectory for the end-effector to pick up and place a cube using the TrajectoryGenerator function I have created. This trajectory is intended to outline the positions of the end effector in the world frame (including the gripper position) as it moves from the initial position to the standoff position, lowers to grab the cube, grabs the cube, lifts to the standoff position, moves to above the final position, places the block, ungrips the block, and moves to the standoff position above the block's final position.

This simulation is composed of 8 trajectory segments which can be seen in the code, though the code produces a csv that is once trajectory for the whole task.

How to use:

The code defines the TrajectoryGenerator function which takes in 5 transformation matrices and a k-value for time scaling. These matrices are:

- The end-effector's initial position in the space frame
- The cube's initial position in the space frame
- The cubes final position in the space frame
- The position of the end-effector in relation to the cube as it grasps
- The position of the end-effector in relation to the cube in "standoff" position

To use this function, feed the matrices into the function in the order provided and it will produce a trajectory for the 8 motion segments and return a csv file containing a list of rotation matrix values, p-values, and gripper open/closed value on each line.

To see how the csv file provided was created. Simply open the code and run the file. Another csv file will be produced under the name "traj.csv".