Milestone 2 Reference Trajectory Generation

This milestone calculates the trajectory for the end-effector frame {e}. This trajectory consists of eight concatenated trajectory segments. Each trajectory segment begins and ends at rest. The method I chose is CartesianTrajectory, which means the end-effector frame follows a straight line, decoupled from the rotational motion.

How to use

Open the Main.m under the code folder and Run

Global variable

```
Tf = [1 1 1 1 1 1 1 1];
%Segment time of the motion Tf in seconds from rest to rest,

N = Tf.*k./0.01;
%The number of points for each segments
```

Function

```
[Tse_N] =
TrajectoryGenerator(Tse_init,Tsc_init,Tsc_final,Tce_grasp,Tce_standoff,k)
```

Inputs

Tse_init: The initial configuration of the end-effector in the reference trajectory

Tsc_init: The cube's initial configuration

Tsc_final: The cube's desired final configuration

Tce_grasp: The end-effector's configuration relative to the cube when it is grasping the cube

Tce_standoff: The end-effector's standoff configuration above the cube, before and after grasping, relative to the cube

k: The number of trajectory reference configurations per 0.01 seconds (was set to k = 1)

Outputs

Tse_N: A representation of the N configurations of the end-effector along the entire concatenated eight-segment reference trajectory. It's a (Nx13) matrix. 13 entries of a matrix row are

r11,r12,r13,r21,r22,r23,r31,r32,r33,px,py,pz, gripper state, where Tse = $\begin{bmatrix} r11 & r12 & r13 & px \\ r21 & r22 & r23 & py \\ r31 & r32 & r33 & pz \\ 0 & 0 & 0 & 1 \end{bmatrix}$