# 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 =