ECE555 HW 3

Deadline: Feb 24th, 2022

Given a robot end-effector aligned to coordinate system, orientation q = 1<0,0,0>, located at 7i + 3j +2k. The end-effector is rotated about the two successive axes then linearly translated, use homogeneous transformations to determine the final pose of the end-effector. The end-effector is rotated 90 degrees anti-clockwise about the Z-axis to the via v; after that, the end-effector is further rotated 90 degrees clockwise about the object X-axis, from the v to w. The goal pose, x, is reached in 5 seconds after w is translated by the object 4i -3j + 7k.

What is the final pose of the end-effector? **[15 pts]**

Determine the cubic trajectory coefficients (ao, a1, a2, a3) of the s function **[15 pts]**

Plot the position and trajectory profile of the transformation **[30 pts]**

What is the position and orientation of the system at its maximum velocity **[40pts]**