

ECE 761 - Homework #3

Translation and Rotation Matrices

Use the shape you defined in homework #2.

- 1) Display that object when translated
 - +0.5m in the X direction ($Y=0, Z=0$)
 - +0.5m in the Y direction ($X=0, Z=0$)
 - +0.5m in the Z direction ($X=0, Y=0$)

- 2) Display that object after each of the following operations (done sequentially)
 - Start at reference frame 0, the origin: $(0, 0, 0)$
 - Translate +0.5m along the Z axis
 - Now at reference frame 1
 - Rotate -90 degrees about the X axis
 - Now at reference frame 2
 - Translate +0.1m along the Z axis.
 - Now at reference frame 3
 - Translate -0.5m along the Y axis
 - Now at reference frame 4

Where is each point in earth coordinates (reference frame zero)?

- 3) Display that object after each of the following operations (done sequentially)
 - Translate +0.5m along the Z axis
 - *Rotate 45 degrees about the Z axis*
 - Now at reference frame 1
 - Rotate -90 degrees about the X axis
 - Now at reference frame 2
 - Translate +0.1m along the Z axis.
 - Now at reference frame 3
 - *Rotate +90 degrees about the Z axis*
 - Translate -0.5m along the Y axis
 - Now at reference frame 4

Where is each point in earth coordinates (reference frame zero)?