ECE415 – HOMEWORK 1

Fall 2018

Problem 1

Write a Matlab program to demonstrate the effect of the following 2D transformations: translation, Euclidian, similarity, affine and projective. Transform three different polygons: equilateral triangle, square and hexagon. Choose the polygon vertices as well as a single transformation matrix for each of the transformations (total of 5 matrices).

1. Plot each input object and its 5 transformed versions. Clearly label axes and give each plot a meaningful title.
2. Comment on what characteristics of the shape have been preserved by each of the transformations.
3. Print out transformation matrices.
4. Print out in homogeneous & Cartesian coordinates vertices for each input object and each of the transformed objects.

Please do not use any built-in functions except ones necessary for plotting and vector and matrix algebraic operations. Submission should include a zipped file with homework report as a PDF file and Matlab code as one or more .m files.