**Lab07: Image Formation and Epipolar Constraint**

**Oct 2022**

**Problem 1. Image Formation**

**The output images are as below:**

A model of a house

Description automatically generated with medium confidence

A model of a house

Description automatically generated with medium confidence

**Problem 2. Essential Matrix Constraint**

Result:

Diagram, engineering drawing

Description automatically generated

Diagram

Description automatically generated with low confidence

A picture containing diagram

Description automatically generated

A picture containing graphical user interface

Description automatically generated

These are just some of the results, since the points are selected randomly, the number of possible matrixes varies, it can be 2,4,6, etc. Thus, the image can be different.

We can tell from the image that some of the lines of different essential matrixes all cross the point which are exactly the corresponding points of sift feature points in the first image.

**Problem 3:**

Question1: It is known that for every A and B.

Question2:

Firstly, the distance which the line based upon the candidate Essential Matrix to the candidate points in the second points can be used as an evaluation criterion, we may sum up all 5 distances to be a comparing distance.

Extra Points:

Given R1, R2, T1, T2, the transformation matrix of Camera 1 and 2 can be presented as:

Thus the relative pose of camera 2 with respect to camera 1 is