Project 5 Writeup

Instructions

- Provide an overview about how your project functions.
- Describe any interesting decisions you made to write your algorithm.
- Show and discuss the results of your algorithm.
- Feel free to include code snippets, images, and equations.
- List any extra credit implementation and result (optional).
- Use as many pages as you need, but err on the short side.
- **Please make this document anonymous.**

Project Overview

This project is to reconstruct 3d scene from multiple 2d viewpoints. Overall, I used 8 point algorithms to estimate the fundamental matrix to use to project 2d points to 3d. I also used RANSAC algorithm to increase the accuracy of projections.

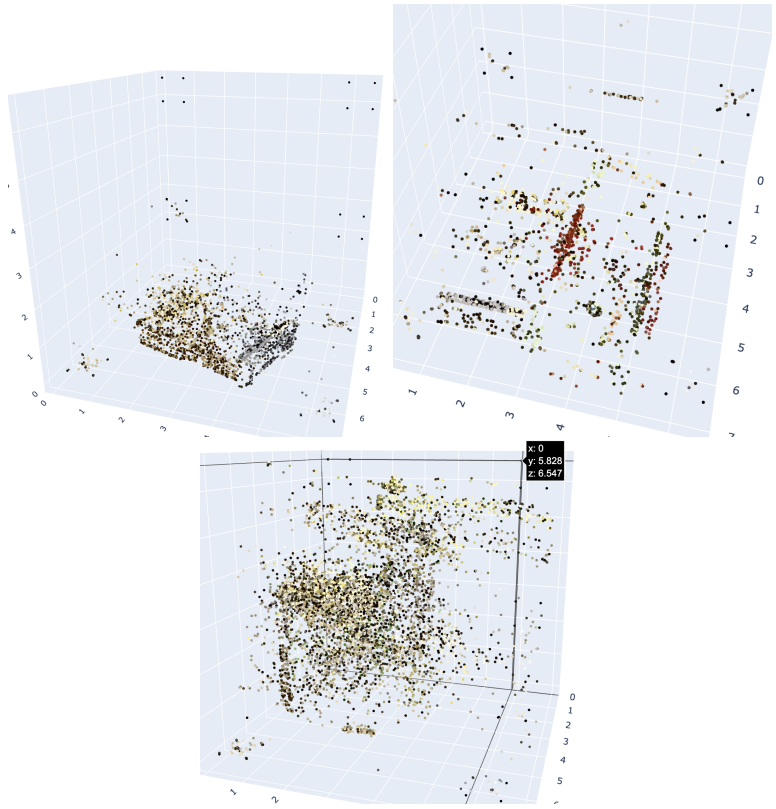
Implementation Detail

My RANSAC removes the possibility of accidentally choosing an outlier matrix to be labeled as the true fundamental matrix, therefore the resulting 3d reconstructed image to be reasonably similar to the ground-truth. I also observed that increasing the number of iterations would increase the confidence of the best matrix as we had more samples to choose from and increased the accuracy of the 3d plotting.

Incorrect matches would make a wrong guess of the 3d-coordinate from the 2d coordinates as we use a pair of 2d points to estimate the 3d-coordinate in $matches_to_3d$ function. It also affects our ransac algorithms especially when the number of iterations is relatively small because they would not be detected as outliers and the estimated fundamental matrix could lose accuracy because of the incorrect matches. That said, when num_iters in ransac is not large enough, I observed that the reconstructed 3d coordinates tend to be inaccurate.

Result

My results are summarized in Table **??**.


x: 0
y: 5.828
z: 6.547