2025 Spring 3D CV HW2

Yelin Zhang

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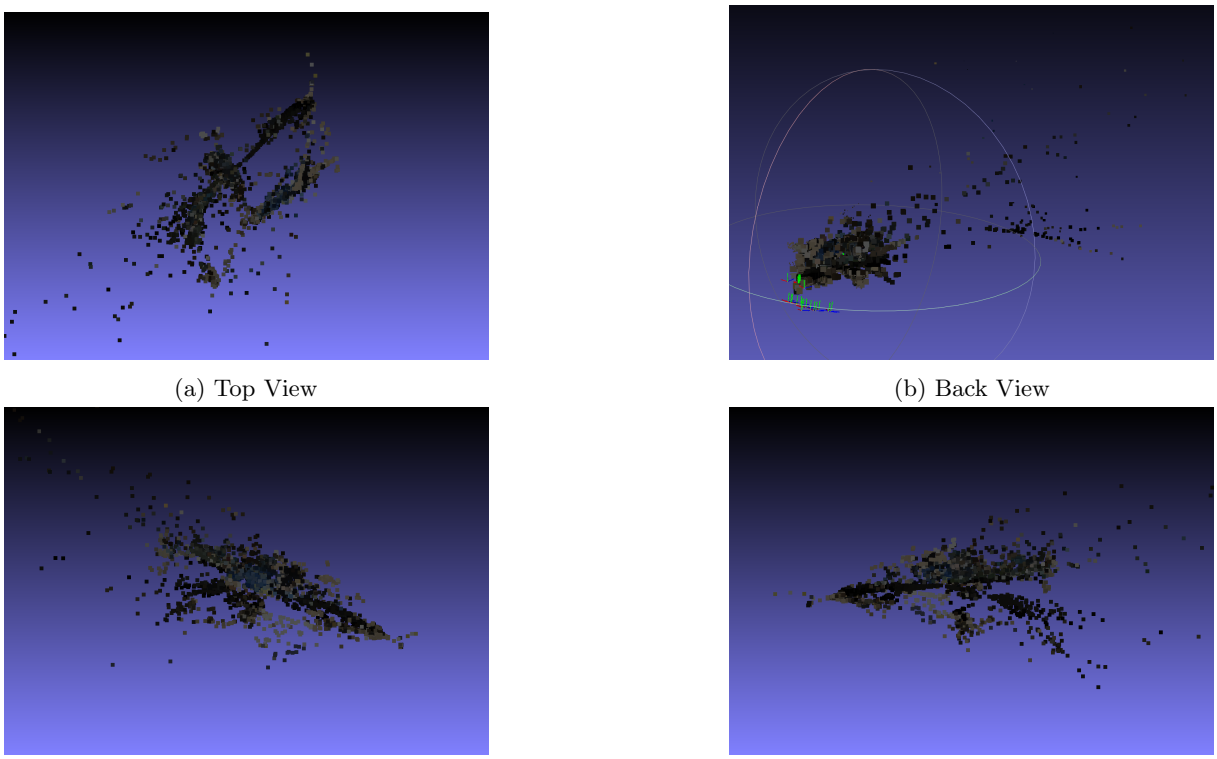
1 Structure from motion

Building the correct feature tracking is crucial for the success of the structure from motion algorithm. Due to problems with the feature tracking early in the project the rest of the project did not work as expected.
After solving out the problems in the code the generated point clouds were analyzed.



(a) Top View

(b) Back View

(c) Left View

(d) Right View

Figure 1: Display of SfM output from different views

The visualization of the output of the structure from motion algorithm is shown in Figure 1. The top view shows the 3D point cloud of the scene, while the back view shows the camera positions and orientations. The left and right views show the 3D point cloud from different angles.
The positions of the cameras is realistic in comparison to the input images. But the 3D point cloud is not entirely correct. Some parts of the wall are kind of visible through the point cloud. But there seem to be a lot of unrealistic black points in the point cloud, which all follow one line roughly.
This might be due to the other bugs in the code, which I could not discover or solve in time.
Some problems of the visualization might also be due to the lack of knowledge on how to use MeshLab.

The code was formatted with ruff, therefore some of the skeleton code has been changed, but only formatting wise.
Python 3.7 was used for the predefined requirements to work.

Own input images were not used due to time constraints.