CMSC733: Computer Processing of Pictorial Information
Project 3: Building built in minutes- SFM approach

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***Abstract*—The aim is to create a 3D structure and obtain the camera poses of a monocular camera with respect to the scene using the standard Structure for Motion approach.**

I. Report

The following are the outputs of the *SfM* pipeline.

A. VSfM: off-the-shelf algorithm

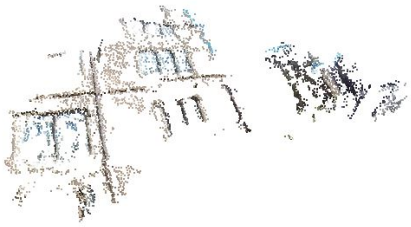

Fig. 1. VSfM

B. Matching and rejecting the outliers via RANSAC

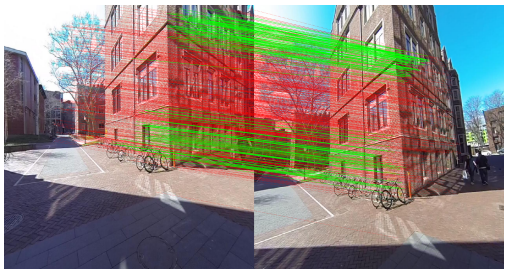

Fig. 2. Matching (Green: After Outlier Rejection)

C. Pose Estimation, Triangulation and Camera Pose Disambiguation

D. Perspective-n-Point

E. Bundle Adjustment

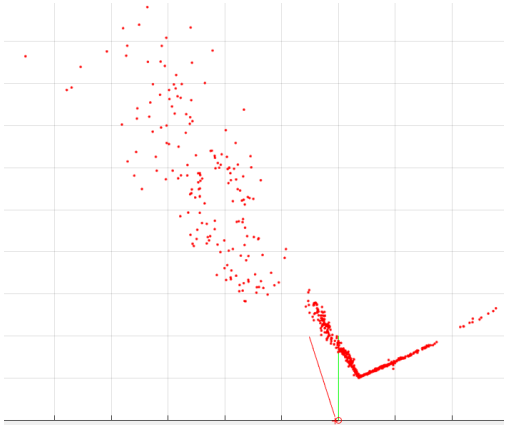

Fig. 3. Linear Triangulation

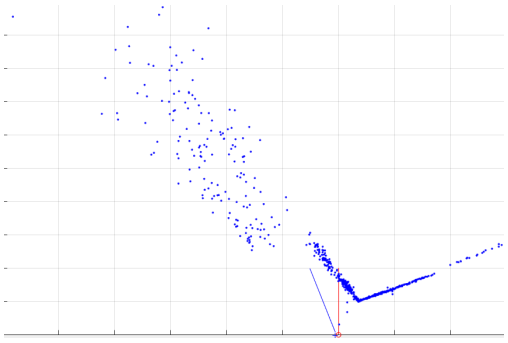

Fig. 4. Non-Linear Triangulation

II. Extra Credit

III. Conclusion

A sparse structure was created from a set of six images.

Fig. 5. Linear PnP

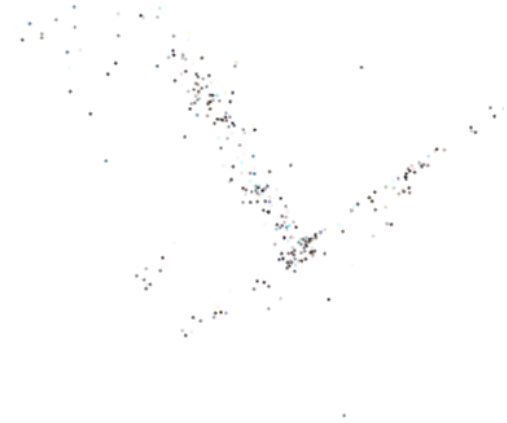

Fig. 6. Non-Linear PnP

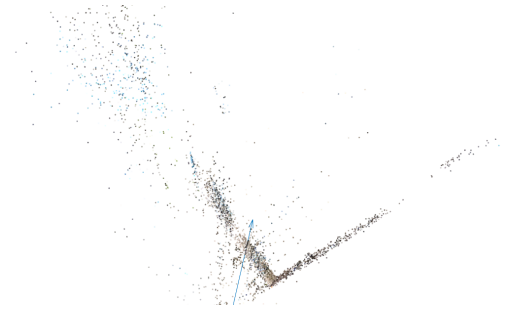

Fig. 7. BundleAdjustment- Top View

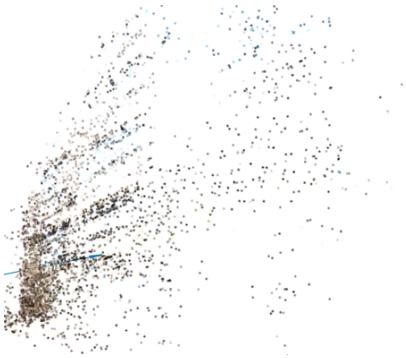

Fig. 8. BundleAdjustment- Right Wall

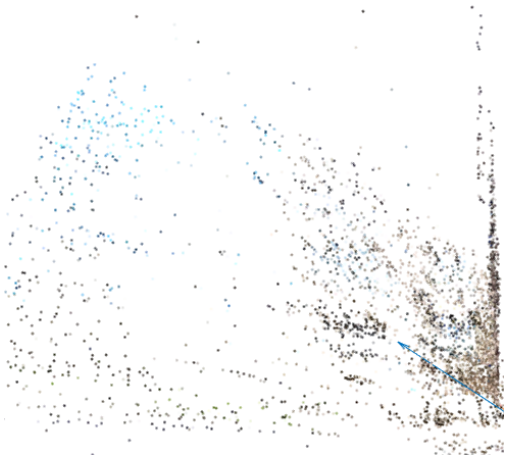

Fig. 9. BundleAdjustment- Left Wall

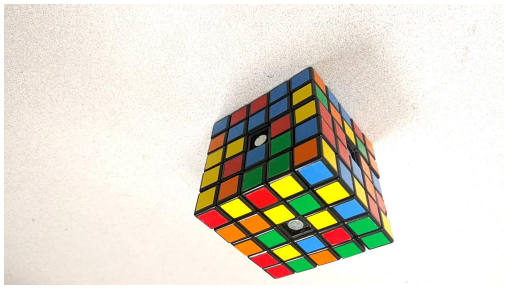

Fig. 10. Rubik's cube original image

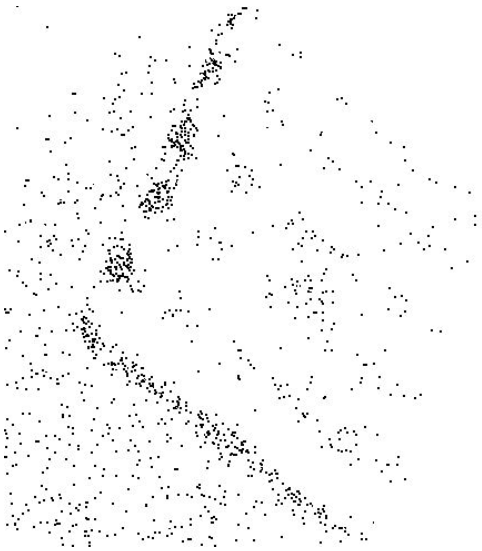

Fig. 11. Rubik's cube SfM (Extra Credit)