

CSCI 5980 Assignment 5

Download the codes for the assignment here.

<https://drive.google.com/open?id=13PLLjuD0gLbGwtyq3aFUZHAIJgtN3g7ge>

Note: the code was developed on MATLAB 2017a, and somehow it cannot work well (the reprojection error is much larger in visualization) on MATLAB 2016a though both versions are provided. I currently have no idea why. I can bring my own labtop and run the program with MATLAB 2017a if it helps grading.

1 Matching

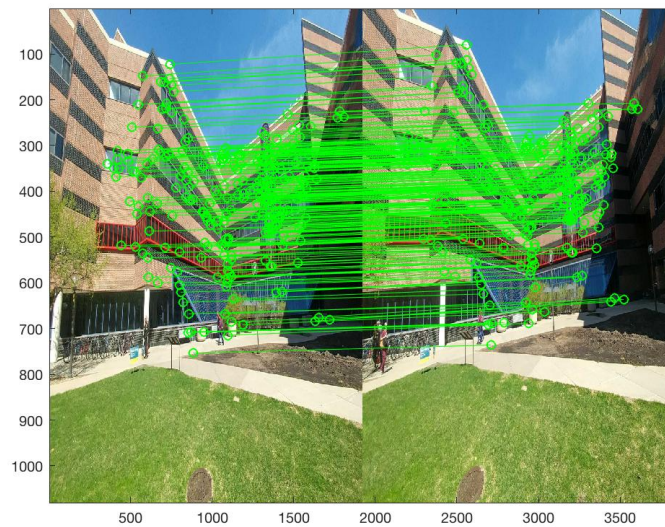


Figure 1: Inlier matches

2 Camera pose estimation

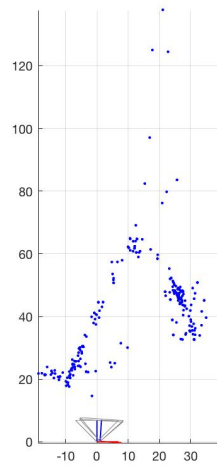


Figure 2: 3D camera pose

3 Nonlinear 3D Point Refinement



(a) Linear estimate



(b) Nonlinear estimate

Figure 3: Nonlinear refinement reduces the reprojection error ($0.10 \rightarrow 0.0275$)

4 Camera Registration

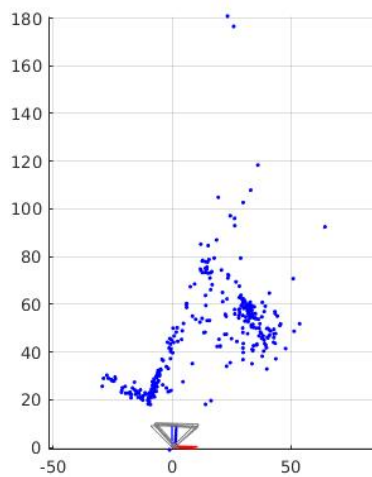


Figure 4: Additional image registration

5 Nonlinear Camera Refinement



(a) Linear estimate



(b) Nonlinear estimate

Figure 5: Nonlinear refinement reduces the reprojection error ($0.083 \rightarrow 0.042$)

6 Bundle Adjustment

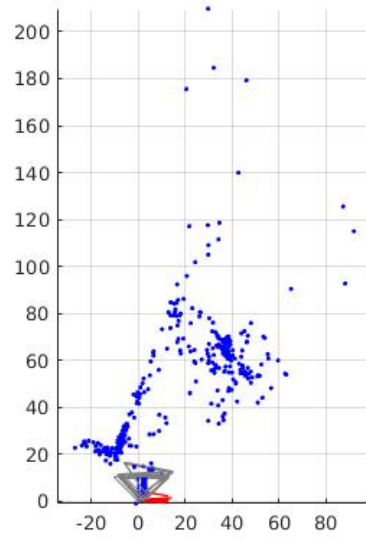
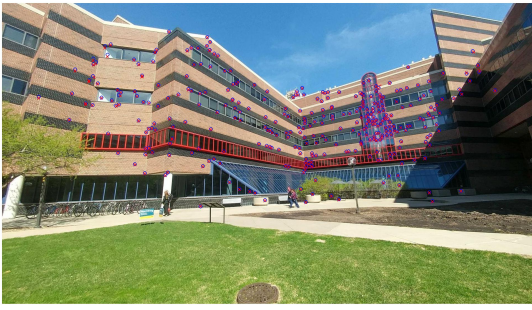
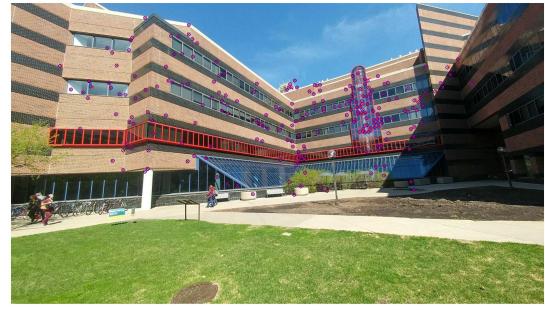


Figure 6: 3D camera pose



(a) Image1



(b) Image2



(c) Image3



(d) Image4



(e) Image5



(f) Image6

Figure 7: Reprojection