CPSC425: Assignment 4 (Python v2.7.15)

Alec Xu
38108130 (p7g9)

March 18, 2020

Part 1

Question (3)

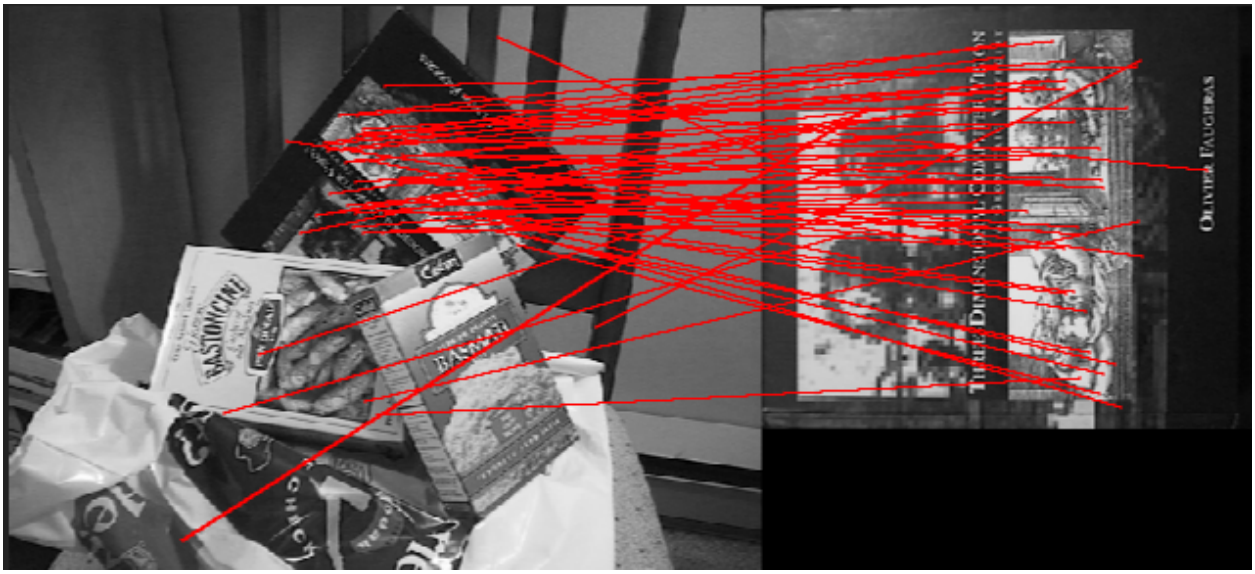

Figure 1: SIFT without RANSAC. threshold=0.80

We chose the threshold value of 0.80 as it provided all the correct lines. Any further increase in the threshold value only added incorrect lines. Decreases to 0.7x removed incorrect lines, but also some correct lines.

Question (4)

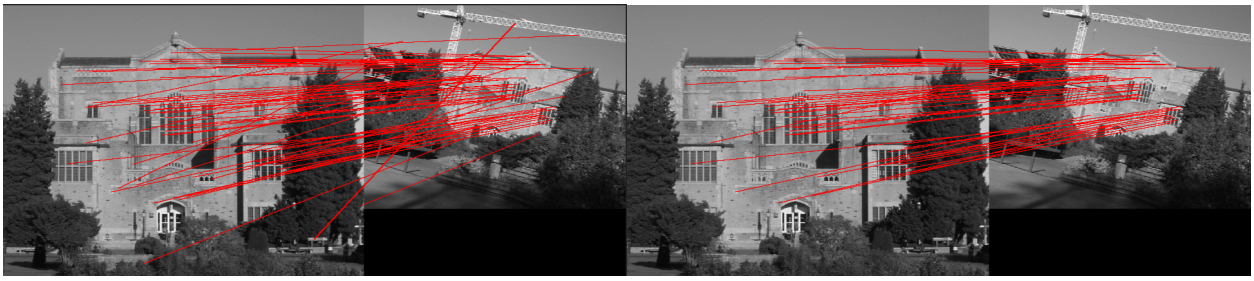

Figure 2: SIFT before and after RANSAC. threshold = 0.75, orient_t = 30, ratio_t = 0.3

As seen in the before and after image, consistency checking vastly improved our number of correct matches. In the left picture we have 5 obviously wrong lines that were removed in our right picture using RANSAC. To achieve no incorrect lines without RANSAC, the threshold needed to be around 0.60. With RANSAC we were able to raise the threshold by 0.15, allowing many more matches to be included.

Part 2

Question (3)

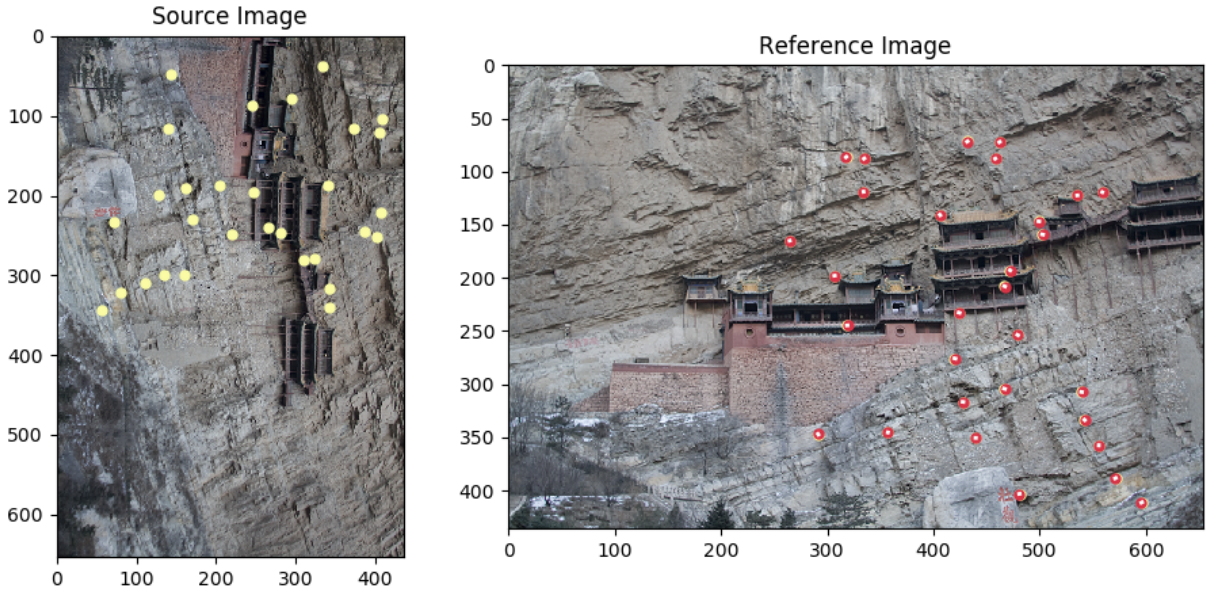

Figure 3: Keypoint projections

Question (4)

We used the given parameters of num_iter=50, tol=10, and ratio_thresh=0.9 as a baseline. From there we tried increasing num_iter to 1000, tol=2, and ratio_thresh=0.2. We found that ratio_thresh decreasing helped our matching the most, as shown below. The clouds match better with a lower ratio threshold. We found that increasing the number of iterations and decreasing the tolerance actually introduced more artifacts into the mosaic.

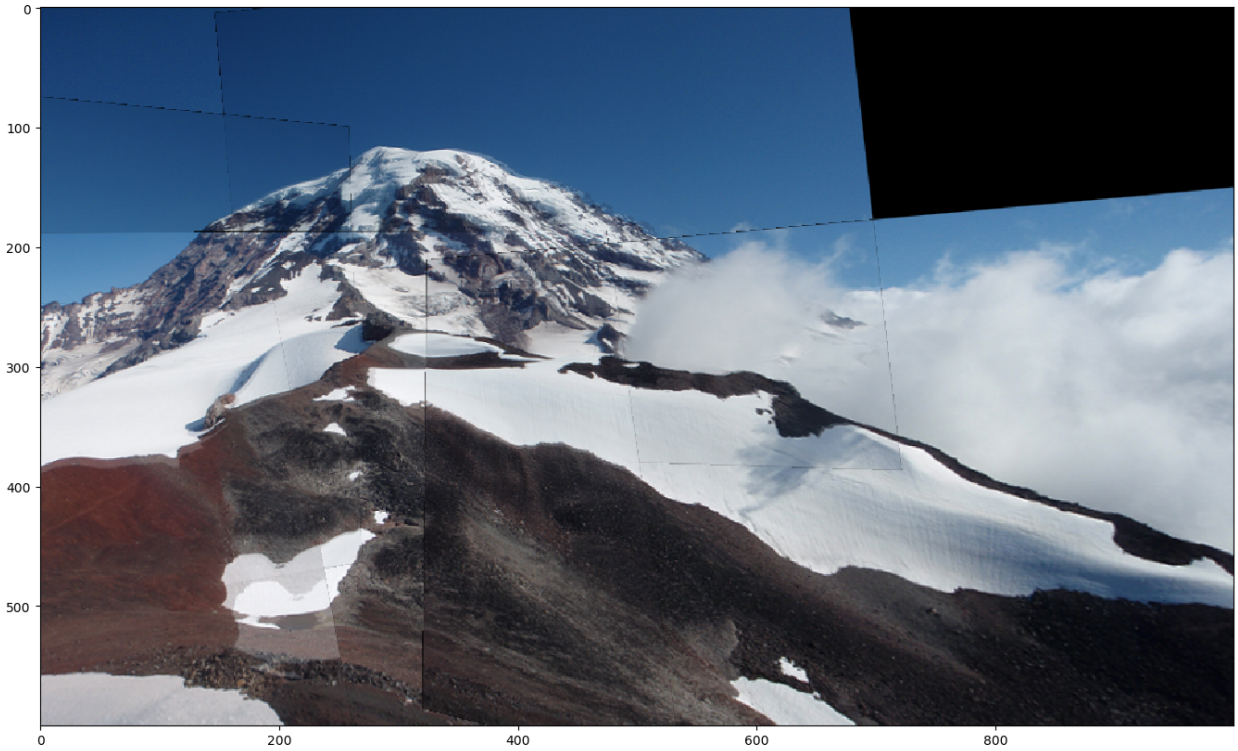

Figure 4: num_iter=50, tol=10, ratio_thresh=0.9

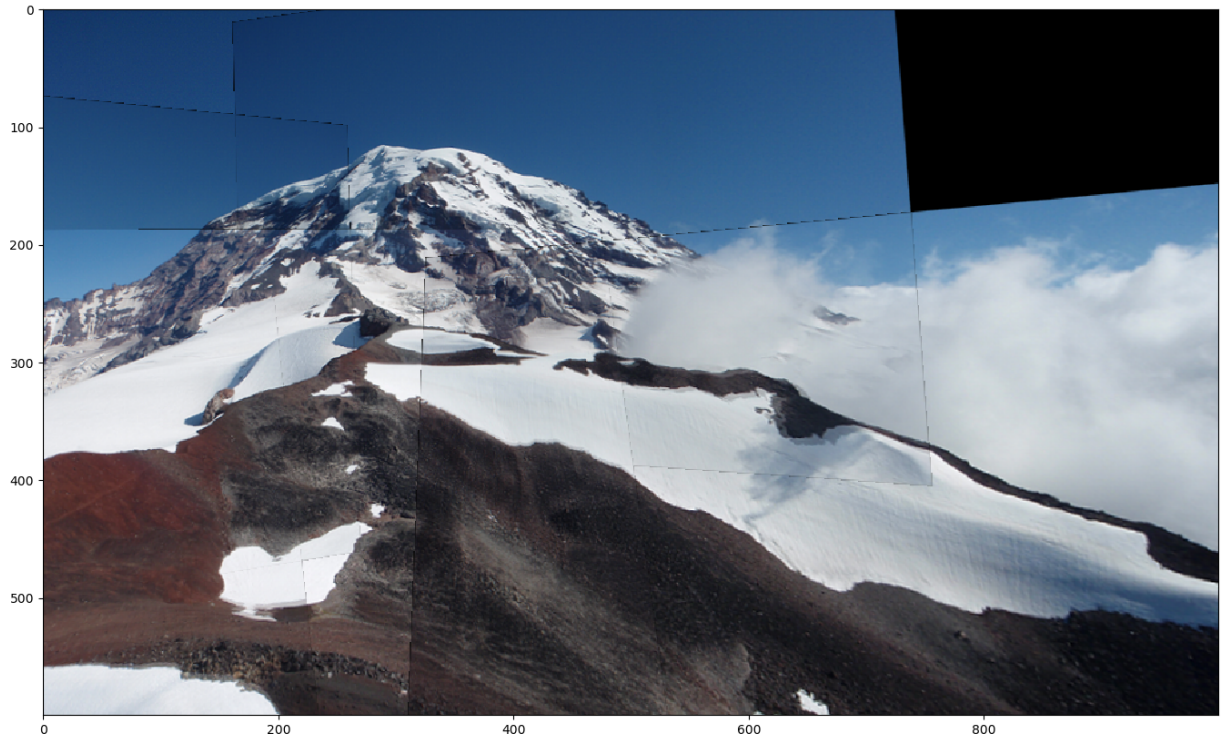

Figure 5: num_iter=50, tol=10, ratio_thresh=0.2

Question (5)

Figure 6: num_iter=50, tol=10, ratio_thresh=0.5

Figure 7: num_iter=100, tol=20, ratio_thresh=0.4

Figure 8: num_iter=100, tol=20, ratio_thresh=0.4