

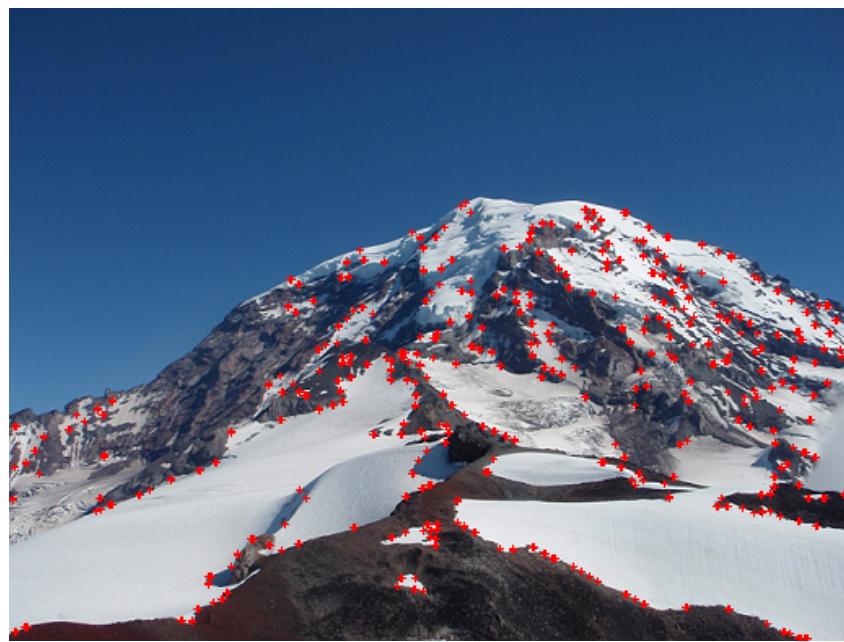
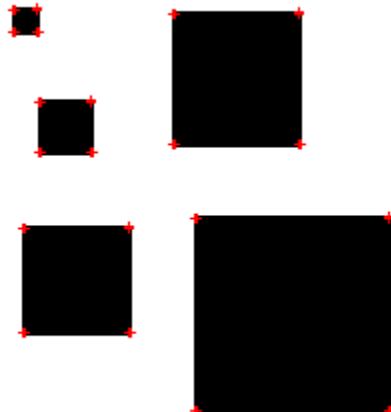
ECE/CSE 576, Spring 2019 Homework 2: Creating Panoramas

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1 Harris Corner Detector

Gaussian blurring was applied with $\sigma = 2$. The Harris response threshold was 50, and non-maximal suppression was done with a 5×5 window. Detected corners are denoted with a red cross. As a sanity check, we apply the algorithm to `Boxes.png`.



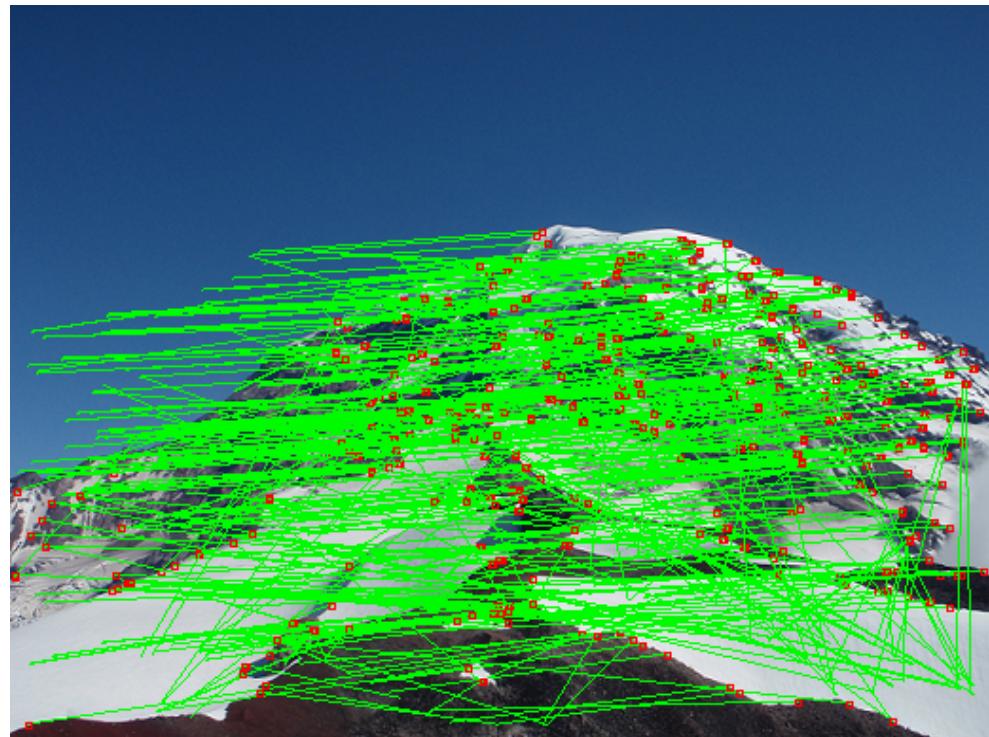
Applied to `Rainier1.png`.



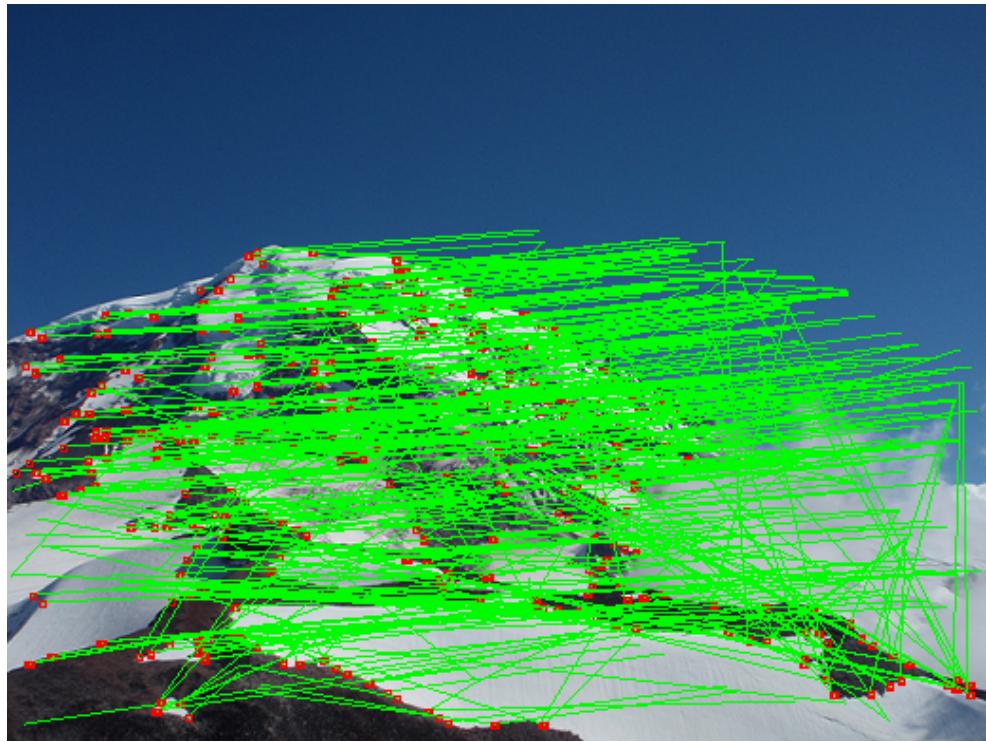
Applied to Rainier2.png.

2 Match Corner Points

The l_1 norm applied to the feature descriptor was used to find matching corner points in the other image.



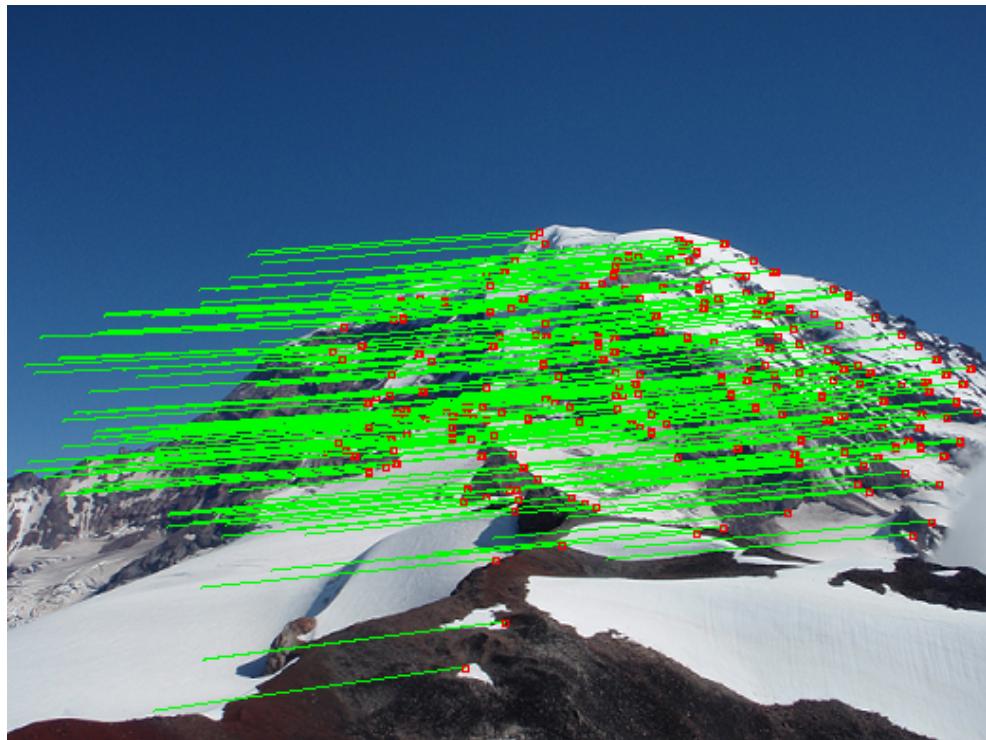
All matching corner points in Rainier1.png.



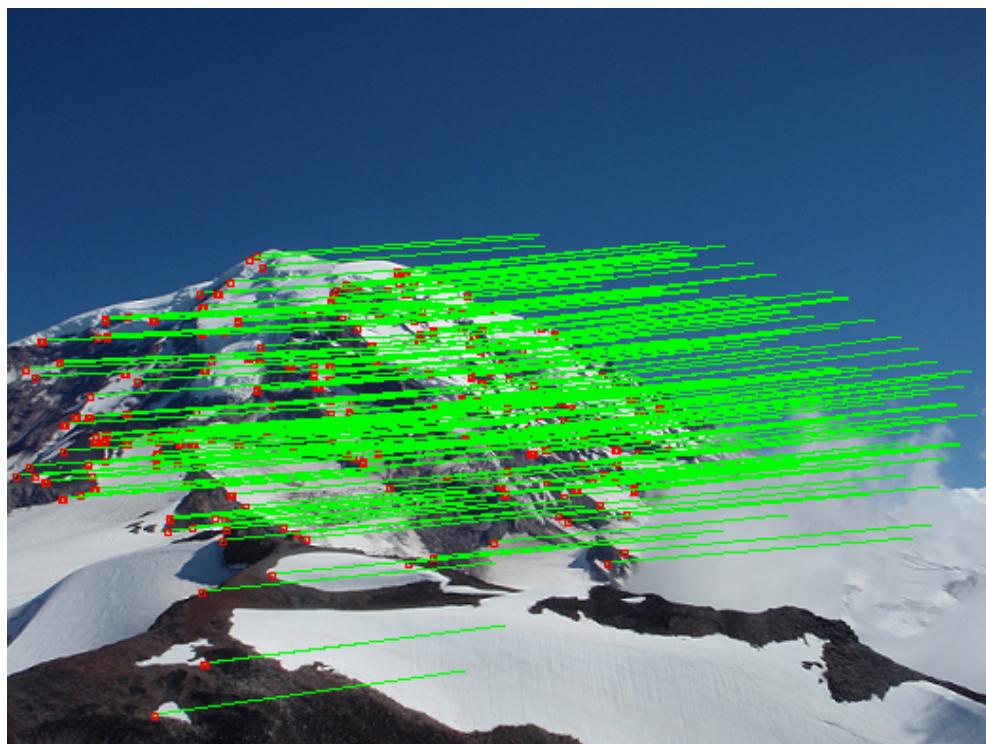
All matching corner points in Rainier2.png.

3 RANSAC

Homographies were sampled by choosing 4 matches. The homography with the largest number of inliers was chosen.



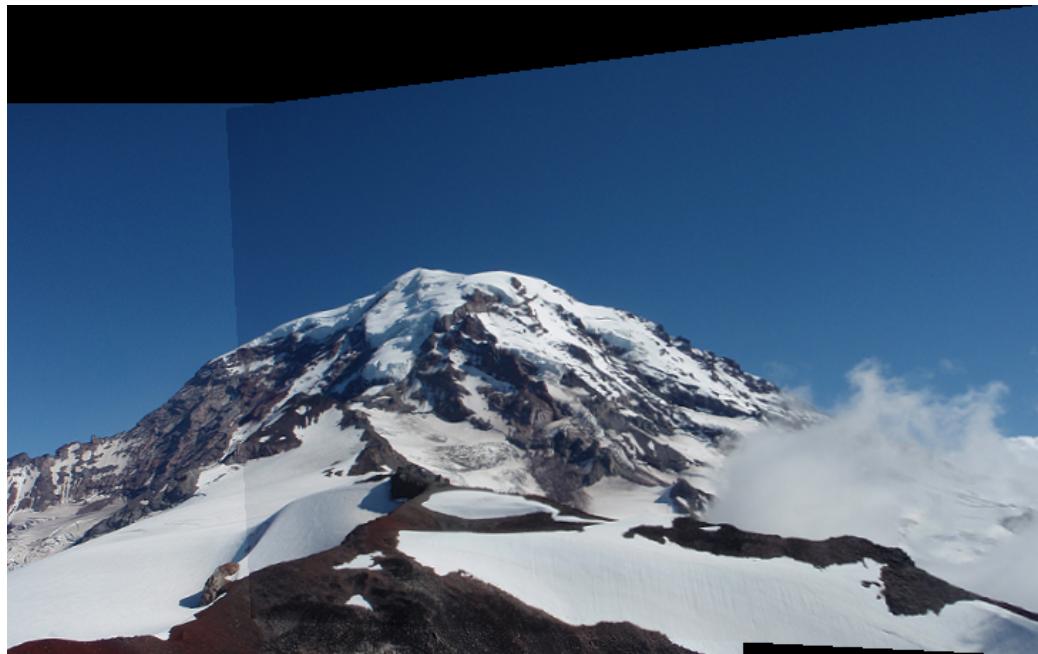
Matches from the homography with the largest number of inliers in Rainier1.png.



Matches from the homography with the largest number of inliers in Rainier2.png.

4 Stitch

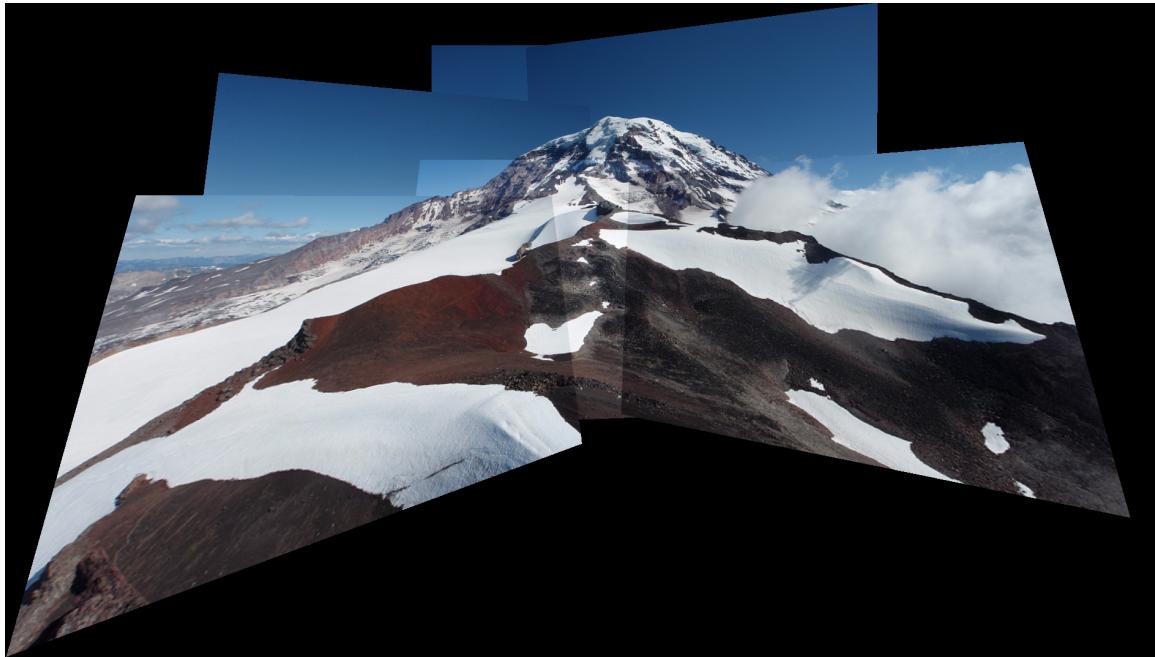
A flat panorama was made by using the first image as the reference coordinate system.



The result of stitching Ranier1.png and Ranier2.png.

Bell: Complete Mt. Ranier Panorama

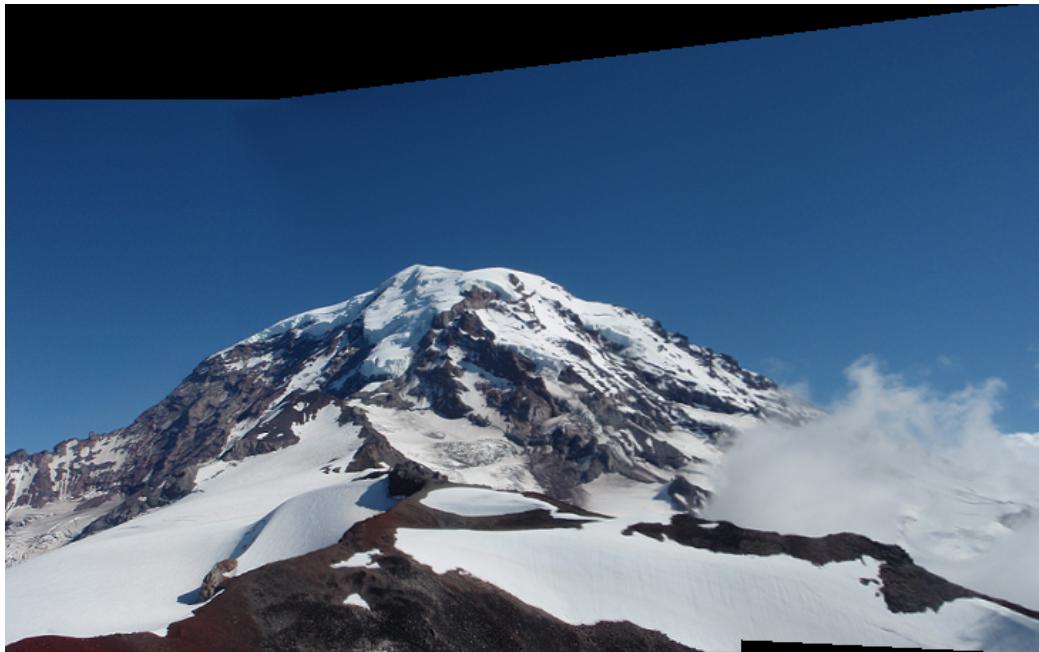
The same technique in Section 4 can be applied repeatedly to get a complete panorama.



The result of stitching Ranier1.png, Ranier2.png, Ranier3.png, Ranier4.png, Ranier5.png, and Ranier6.png.

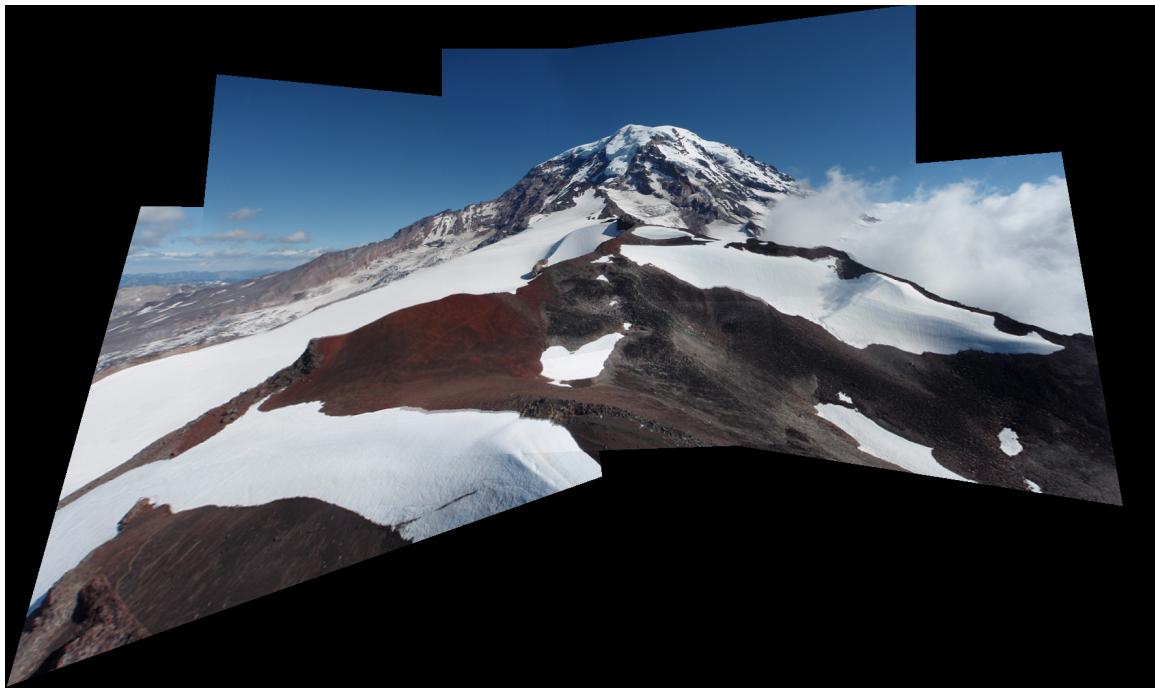
Whistle: Center-weighting

In Section 4 the seam between the two stitched images is apparent. Center-weighting can be used to make seam invisible.



The result of stitching Ranier1.png and Ranier2.png with center-weighting.

The same can be done with the complete panorama.



The result of stitching Ranier1.png, Ranier2.png, Ranier3.png, Ranier4.png, Ranier5.png, and Ranier6.png with center-weighting.