

Panaromic Stiching

RANSAC algorithm to stitch two images. The input to the algorithm are two images which are related by an unknown transformation. blobs detector is implemented to extract keypoints and extract feature descriptors on them. The goal is to estimate an affine transformation using feature matching and RANSAC to produce a combined image.

the overall steps in the alignment algorithm are:

1. Detect keypoints in each image (part 1).
2. Extract SIFT features at each detected keypoints.
3. Match features based on pairwise distance.
4. Use RANSAC to estimate the best affine transformation.
5. Stitch the two images using the estimated transformation.

There are few difficult test images where affine transformation will not produce perfect results. There are certain kinds of 2D transformation cannot be modeled as affine (See section 2.1 in [Richard Szeliski's book](#)). Try to align two images with homography transformation, which is more general than affine, to improve the results.

Below are the results using both affine and homographic transformation to stitch two images

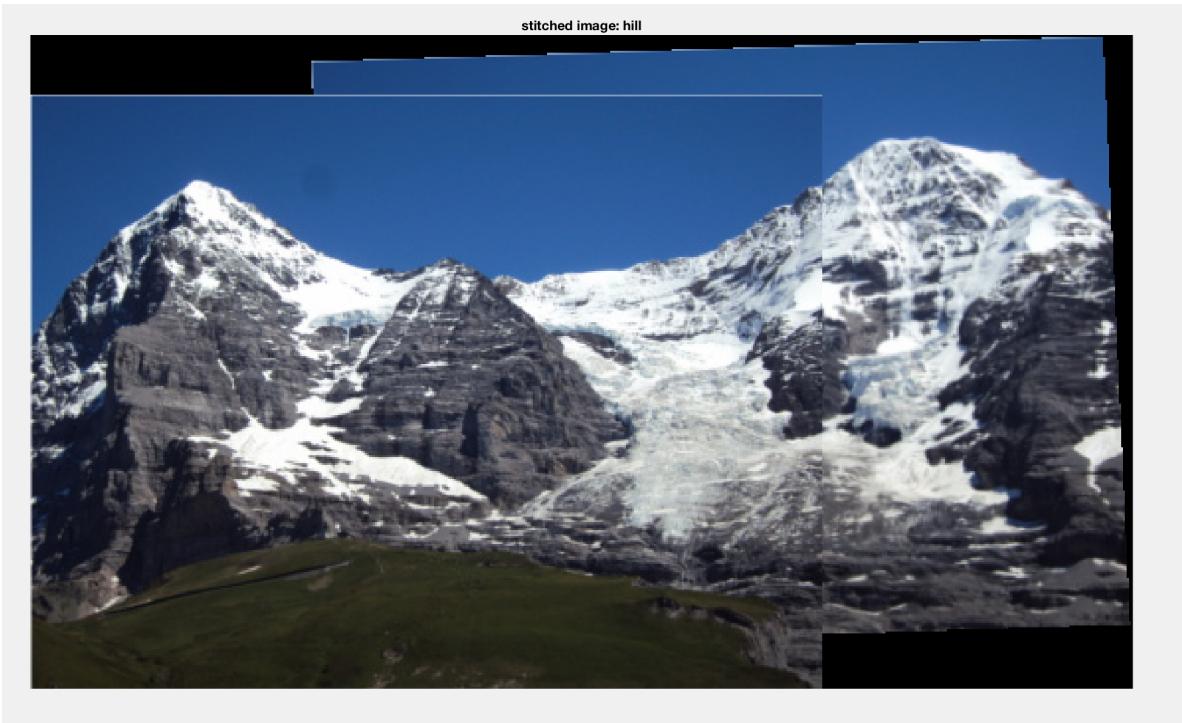


Figure 1: With Affine Transformation: Hill

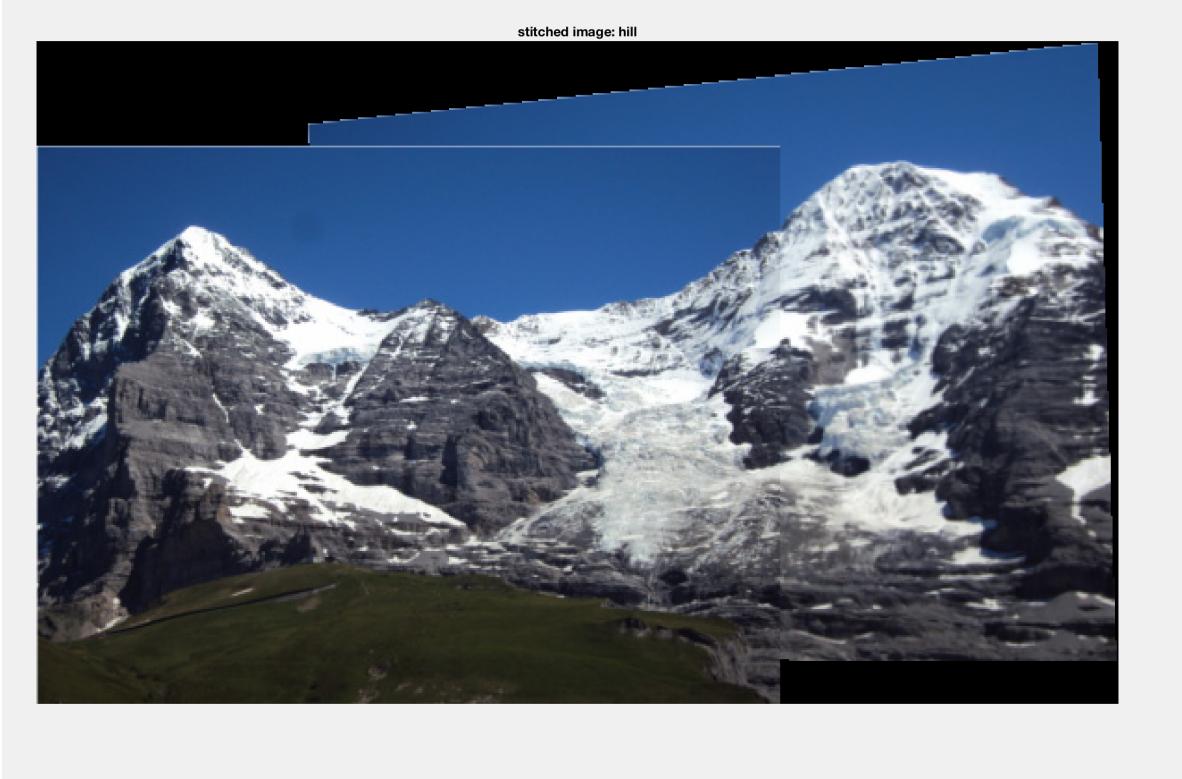


Figure 2: With homography transformation: Hill

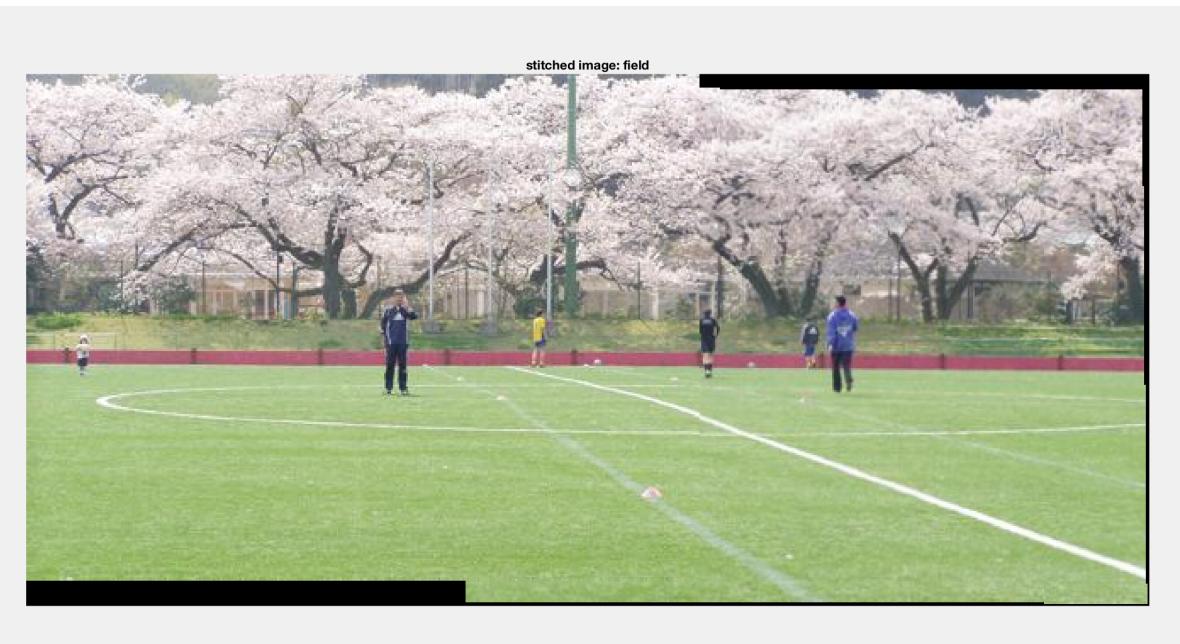


Figure 3: With Affine Transformation: Field



Figure 4: With homography transformation: Field

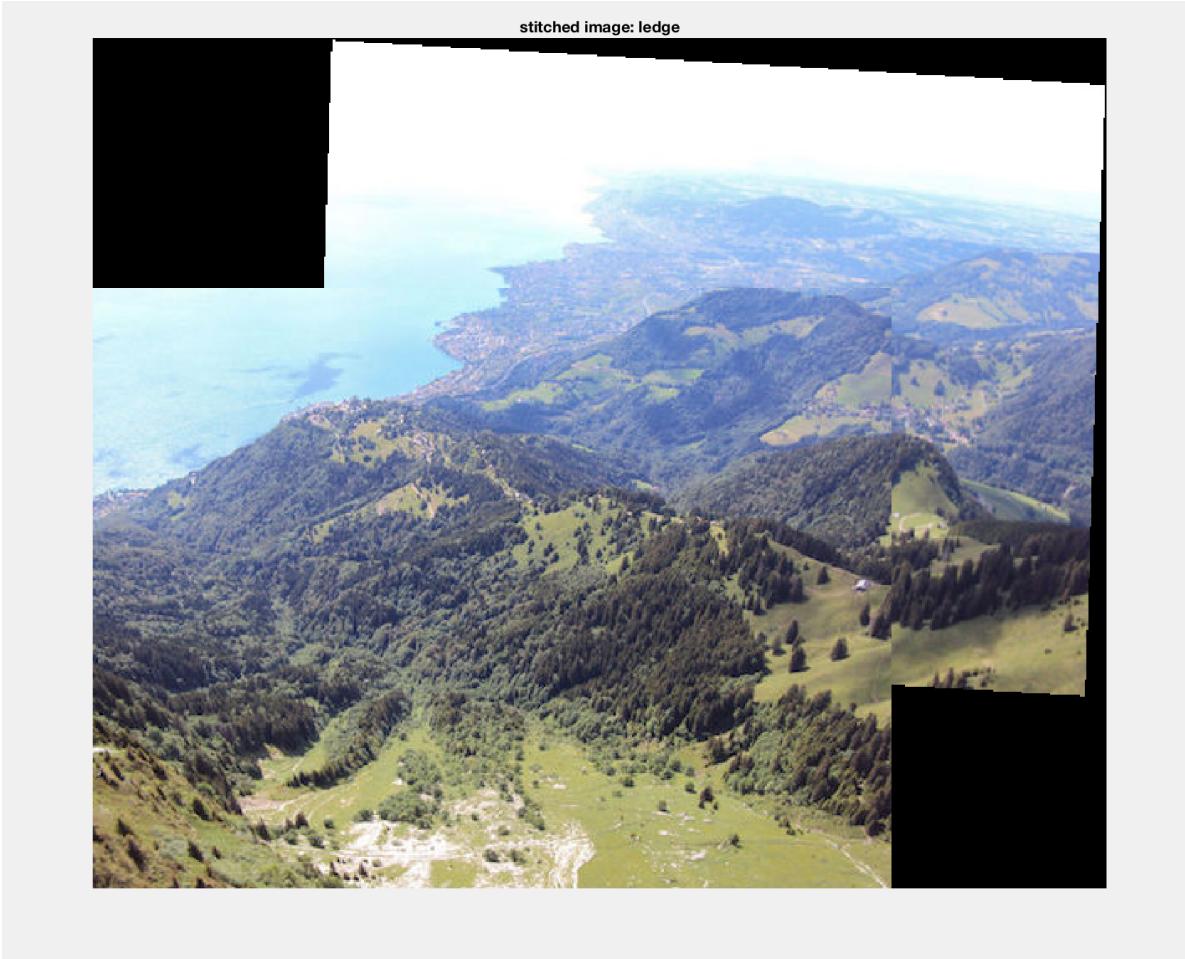


Figure 5: With Affine Transformation: Ledge



Figure 6: With homography transformation: Ledge



Figure 7: With Affine Transformation: River



Figure 8: With homography transformation: River



Figure 9: With Affine Transformation: Pier

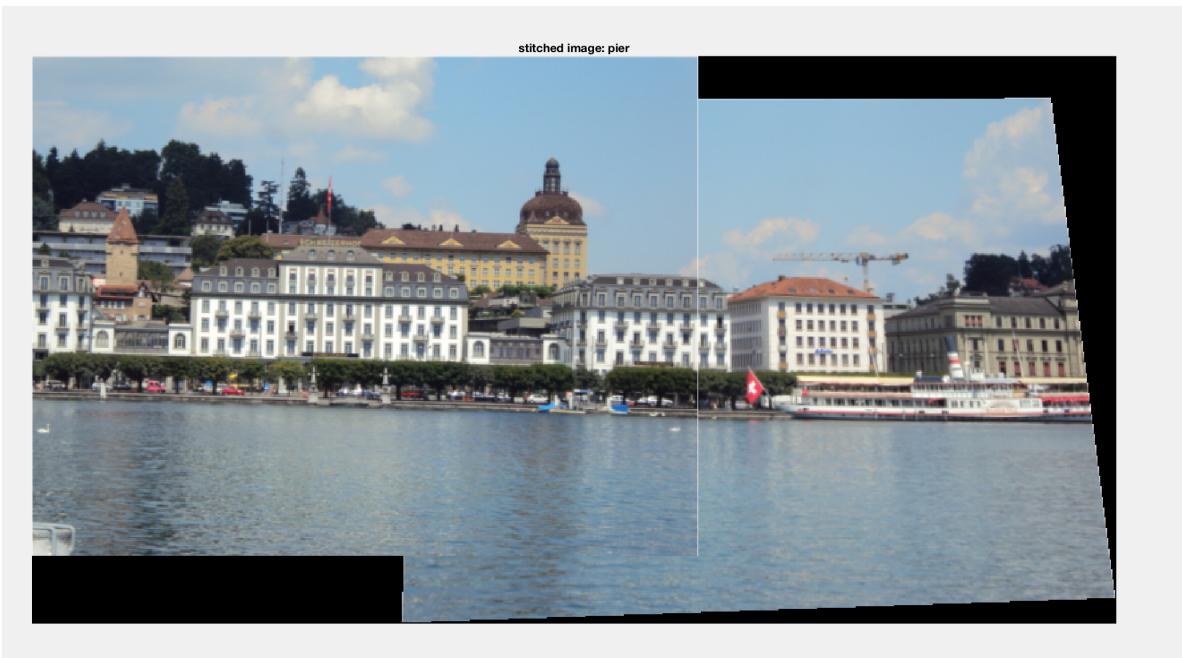


Figure 10: With homography transformation:Pier

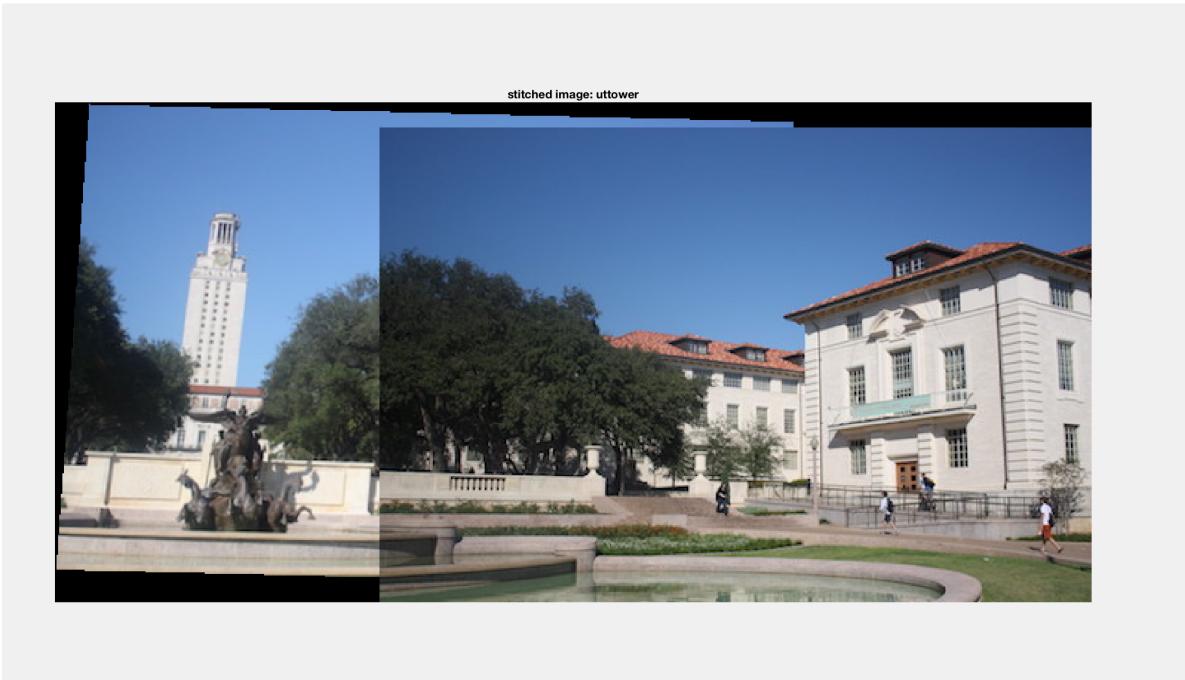


Figure 11: With Affine Transformation: Tower



Figure 12: With homography transformation: Tower



Figure 13: With Affine Transformation: Roof



Figure 14: With homography transformation: Roof

stitched image: building



Figure 15: With Affine Transformation: Building

stitched image: building



Figure 16: With homography transformation: Building