



2 Part 2: Image Mosaics

In this part of the assignment, you will implement an image stitcher that uses image warping and homographies to automatically create an image mosaic. We will focus on the case where we have two input images that should form the mosaic, where we warp one image into the plane of the second image and display the combined views. original input.

Figure 4: Image Mosaics



(a) First View



(b) Second View



(c) Final View



2.1 Getting Correspondences and Compute the Homography Parameters

The first steps of this part is the same as 1.1 and 1.2. We will follow the same steps to get the correspondences and the homography matrix.

2.2 Warping Between Image Planes

Write a function that can take the recovered homography matrix and an image, and return a new image that is the warp of the input image using H . Since the transformed coordinates will typically be sub-pixel values, we can solve this by rounding the resulting coordinates or by distributing the pixel value to the nearby destination pixels. For the later case the destination pixel value is the average of any pixel values that maps to it. For color images, warp each RGB channel separately and then stack together to form the output.

To avoid holes in the output, use an inverse warp. Warp the points from the source image into the reference frame of the destination, and compute the bounding box in that new reference frame. Then sample all points in that destination bounding box from the proper coordinates in the source image (linear interpolation). Note that transforming all the points will generate an image of a different shape/dimensions than the original input.

2.3 Create the output mosaic

Once we have the source image warped into the destination images frame of reference, we can create a merged image showing the mosaic. Create a new image large enough to hold both (registered) views; overlay one view onto the other, simply leaving it black wherever no data is available. Do not worry about artifacts that result at the boundaries.

3 Bonus

Instead of stitching 2 images, stitch 3 images that overlap with each other.

- Stitch 2 images together following the previous steps.
- Get correspondences between the output of stitching the 2 first images and the third image Note: The order of stitc.
- Stitch the output with the third image creating the final output .

Note: The order of stitching yields different results.



4 Notes

You are required to deliver the following:

- Your code.
- Output video.
- The panorama result of the provided 2 images, and the panorama of another example of your choice.
- Report including explanation of your code and representative results on sample test images.

You should work in groups of 3.

Part one of the assignment is inspired from Carnegie Mellon University(CMU).