University at Buffalo

CSE 473/573 – Computer Vision and Image Processing

Pratik Malani – 50416266

Project 12 – Background Stitching and Image Panaroma

Task 1 – Background Stitching

These were the two images that were provided and the task required us to stitch the two images into one image and remove the foreground.

Steps:

- The first step was feature extraction (for both keypoints and descriptors) from the two images using SIFT.
- Then using standardized Euclidean was used depending on the descriptors to manually match the pixel coordinates. Which were then identified using a threshold percentage.
- Next, cv2.findHomography function was used to find the homography matrix to transform the image.
- Later the images were overlapped using the cv2.warpPerspective function and then stitched.
- Finally, the foreground was removed from the images using conditional arguments and displayed the final resultant image.

- **Resultant Image:** 

Task 2: Image Panorama




These were the four images that were provided to stitch into one panoramic image. The initial steps were similar to the previous task like feature extraction using SIFT and using standardized Euclidean for matching of the descriptors. The next steps were also similar like finding the homography matrix, warping using perspective transform and stitching for the first two images. Finally, the first two images were stitched with the third image and that stitched image was stitched with the fourth image to give the resultant image.

Final Image: 

Task 3: Bonus





For this task the 5 images were taken from my residential apartment at South Lake Village Apartments, University at Buffalo North Campus. The same code from part 2 was used on these images to get the panorama image.

Output Image:

References:

- https://docs.opencv.org/4.x/da/df5/tutorial_py_sift_intro.html
- https://docs.opencv.org/3.4/d1/de0/tutorial_py_feature_homography.html
- https://towardsdatascience.com/image-stitching-using-opencv-817779c86a83