

Assignment- 4

Aim:

1. To determine the fundamental matrix between two images.
2. To search along the epipolar line for every point in the reference(img2) and replace that location with a corresponding point in source(img1).

Methodology:

1. First we determine the fundamental matrix between the image pair using OpenCV inbuilt function.
2. Then find the epipolar line for every point in the reference image and find the corresponding point in the source image.
3. Create a window around the pixel location in the reference image of a size 4x4.
4. Multiply the window by a gaussian function to give more weight to central pixel. Use the value of $\sigma = 4/6$ where 4x4 is the size of the gaussian filter.
5. Find a similar neighbourhood for every point on the epipolar line weight it with the same gaussian, and establish the pixel wise difference with the patch on the reference image.
6. Find the location which gives minimum patch difference and replace the pixel value in the source image at that location in the reference image.
7. Repeat the procedure for all pixels in the reference image.
8. The final output of size equal to the reference image is being displayed.

Results:

Image Set 1:

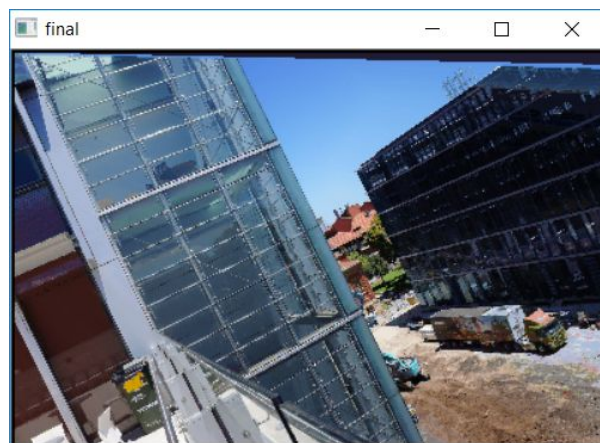


Image Set 2:

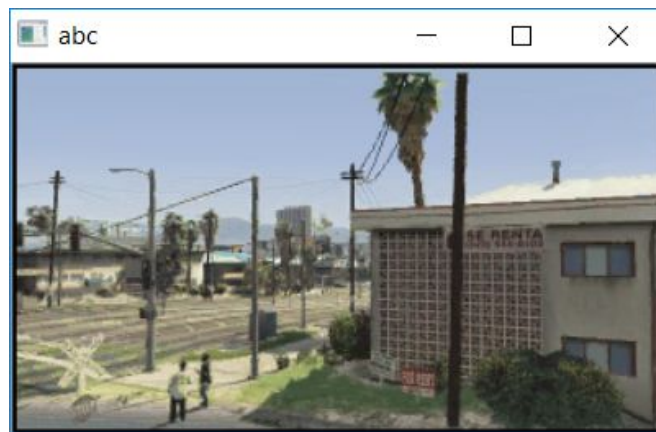


Image Set 3:

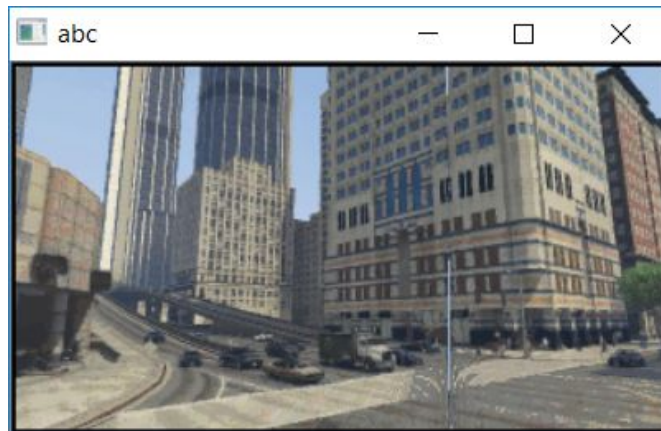


Image Set 4:



Observations:

1. The warping is ineffective when we have a region present in the 2nd image that does not have any correspondence in the 1st image. This is particularly observed in the case of image set - 4 where a blue area exists when warped.
2. The image set 2 shows that when the images have when there is not existing a pure rotation matrix between the two images, there is imperfect warping obtained between the images.