

COL780

Assignment 2

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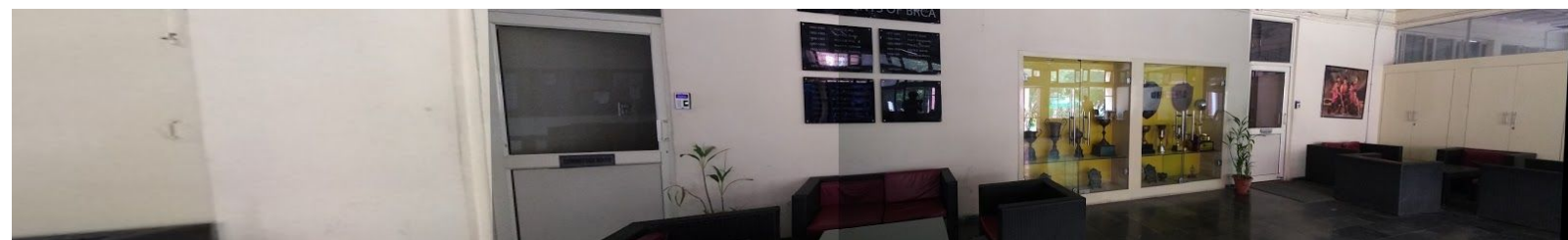
Problem statement:

To generate a panoramic image by stitching together multiple images of a scene.

Approach:

1. We first extracted the features and then matched them. For feature extraction we used Scale Invariant Feature Transform (SIFT) algorithm.
2. We get keypoint descriptor, which is a descriptor for each keypoint of 128 dimensions.
3. In order to get rid of incorrect feature points, RANSAC algorithm is applied. We select a subset of inlier matching pairs and discard the outliers.
4. Now to get homography matrix we used OpenCV API.
5. After getting homography matrix and applying it to the target images we get the panorama.
6. To stitch multiple images, we partition the collection of images into two halves, one for which the transformations are applied to the LEFT and one for which the transformations are applied towards the RIGHT. This allows us to balance the distortion due to warping on both sides.

Results:





Conclusions:

Due to the lack of time, we couldn't perfect the blending of the images, but our focus was on getting the perspectives correct for all the images. From the above results, we notice a lot of distortion in the leftmost image in cases 2 and 3, that's because the algorithm is choosing the second image as the middle image in these cases, and most of the images taken highlight the rightward direction. These errors can be rectified by choosing another image as the reference image. Another part we would like to highlight is the fact that we resize the images to a width of 1000 pixels, to maintain a certain degree of execution speed. Moreover, our algorithm has to be fed the images in the order they are to appear in the final image, so we have to manually label the images before our script is run.

References:

<https://github.com/linrl3/Image-Stitching-OpenCV>
https://opencv-python-tutroals.readthedocs.io/en/latest/py_tutorials/py_imgproc/py_pyramids/py_pyramids.html