

# Panorama Stitching RGB-D

**Rwik Rana 18110146 IITGN ASSIGNMENT-2 3d Computer Vision**

This is an assignment regarding stitching 2 images (taken from different perspectives) to create a panorama using the RGB and Depth data. The concepts of quantization of depths, inverse homography, warping, RANSAC and Laplacian Blending to solve the problem statement.

## **Flow of the Code:**

1. Quantize the depth images. Do the following for each quantized level.
2. SIFT to detect and extract features from each depth level.
3. Matching features between each depth level of the reference image and the whole source image using K nearest neighbours.
4. Finding the homography matrix for each depth level i.e., the mapping from one image plane to another. This is an iterative procedure. I used RANSAC to get the best homographic matrix. Out of the matching points found using KNN, 4 random points are selected to get a homography matrix. Using the homography matrix obtained, we try transforming all the points. If the error between the transformed and current points are less than a threshold, the homography matrix is rewarded. This loop is iterated again and again. The matrix with the best score is taken to be the ideal homography matrix.
5. Warping the images using the inverse of homography matrix to ensure no distortion/blank spaces remain in the transformed image.
6. All the warped parts of the reference image are stitched with source image.

## **Assumptions:**

1. Images are input such that successive images have a common intersection.

## **THOUGHTS:**

The RGB warping seems to give more cleaner result than the RGB-D warping. As the number of layers are increased, the matches for each level decreases in the RGB-D warping and thus, converting it to RGB warping. Some method has to be found out to make the homography matrix formed using the depth level more robust to give better result. Theoretically RGB-D images should have given better results, given we have the depth information of the image,

**My Submission :**  
**Hard coded functions RGB-D**



**Opencv Functions used RGB-D**



**Stitching without depth data**



**My Submission :**  
**Hard coded functions RGB-D**



**Opencv Functions used RGB-D**



**Stitching without depth data**



**My Submission :**  
**Hard coded functions RGB-D**



**Opencv Functions used RGB-D**



**Stitching without depth data**

