Computer Vision Project # 2

Panorama Stitching

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Introduction:

Panorama stitching is a process of combining two or more images from the same scene into a single image. It is based on the number of common features in all the images.

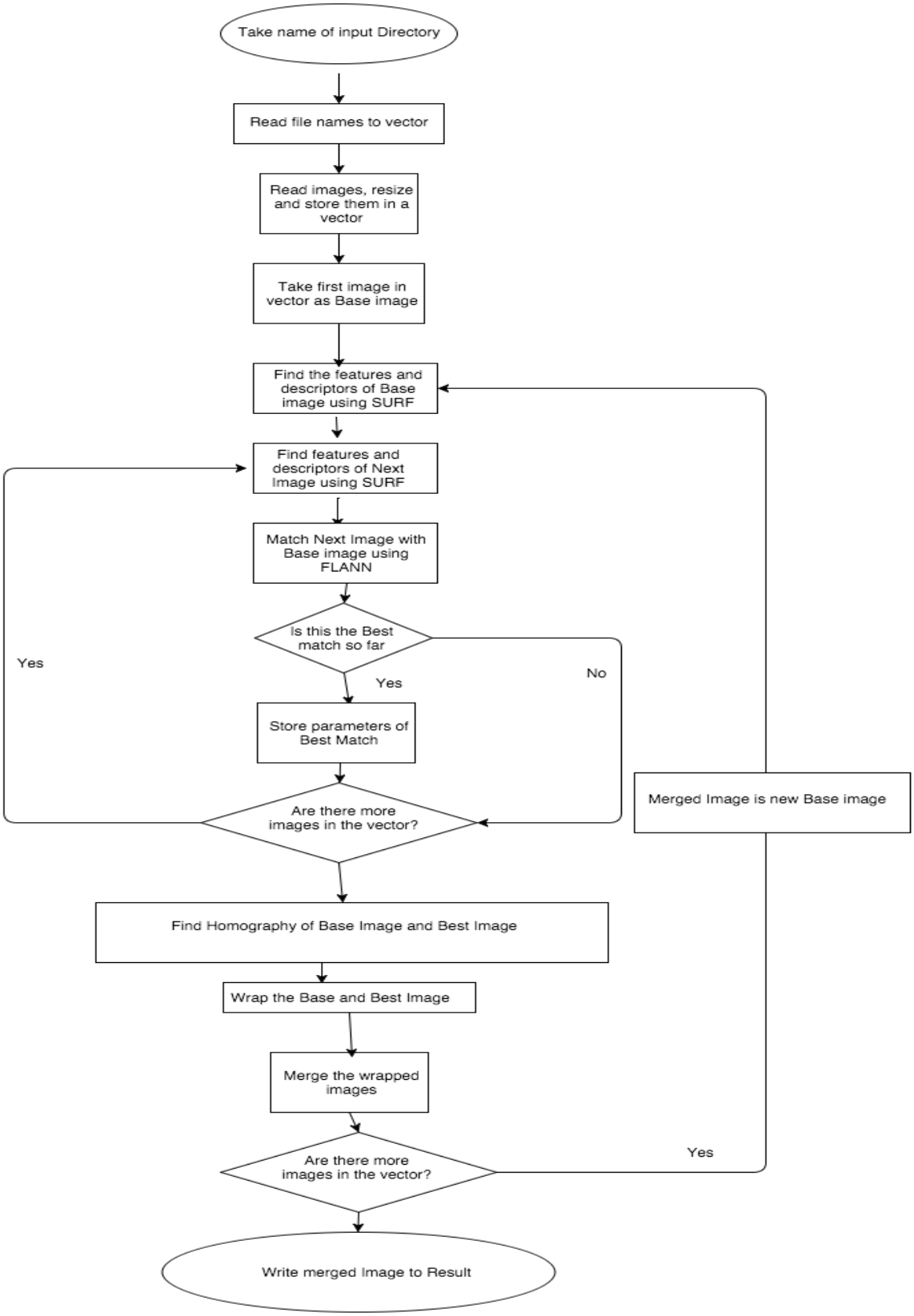
Algorithm:

All the images of the directory were read into a vector and then resized. After resizing the images, the first image in this vector is taken as the key or base image.

Features of the base image are found using SURF detector, which is transition invariant. Next, the features of all the remaining images are found and matched with the base image. By matching, we find the best match for the base image, which is, the image whose ratio of distance to number of features is minimum.

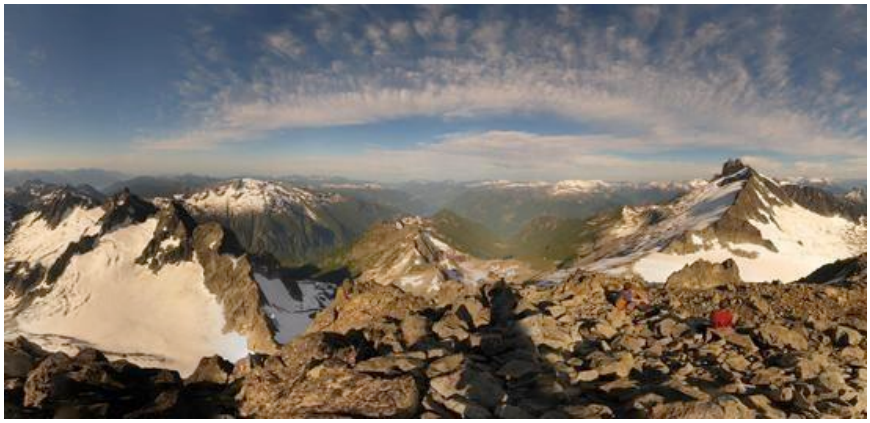
After finding the best match, we find the homography matrix for the base image and the best match image, then wrap both images to size 5000,5000. The wrapped images are overlayed and extra black area is cropped. This new image is the base image for the next iteration.

Flow Chart

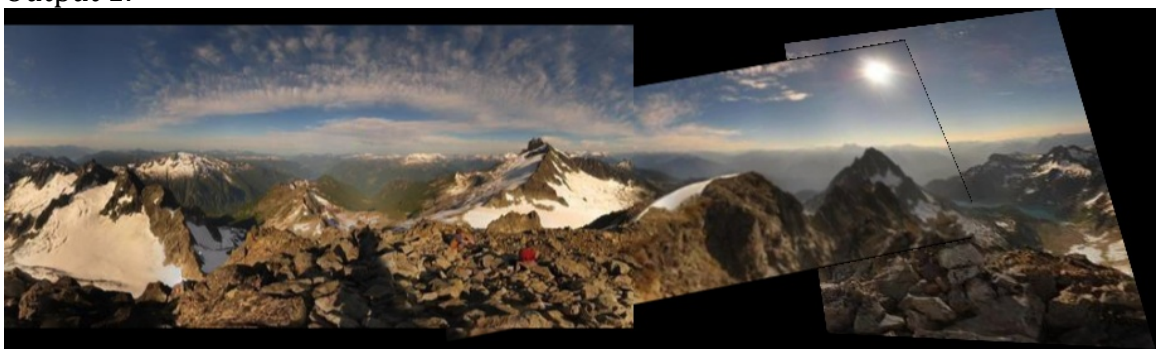

Take name of input Directory
Read file names to vector
Read images, resize and store them in a vector
Take first image in vector as Base image
Find the features and descriptors of Base image using SURF
Find features and descriptors of Next Image using SURF
Match Next Image with Base image using FLANN
Is this the Best match so far
Yes
No
Yes
Store parameters of Best Match
Are there more images in the vector?
Merged Image is new Base image
Find Homography of Base Image and Best Image
Wrap the Base and Best Image
Merge the wrapped images
Are there more images in the vector?
Yes
Write merged Image to Result

Sample Results

Input 1:



Output 1:



Result 2: