

# **Computer Vision Assignment 4**

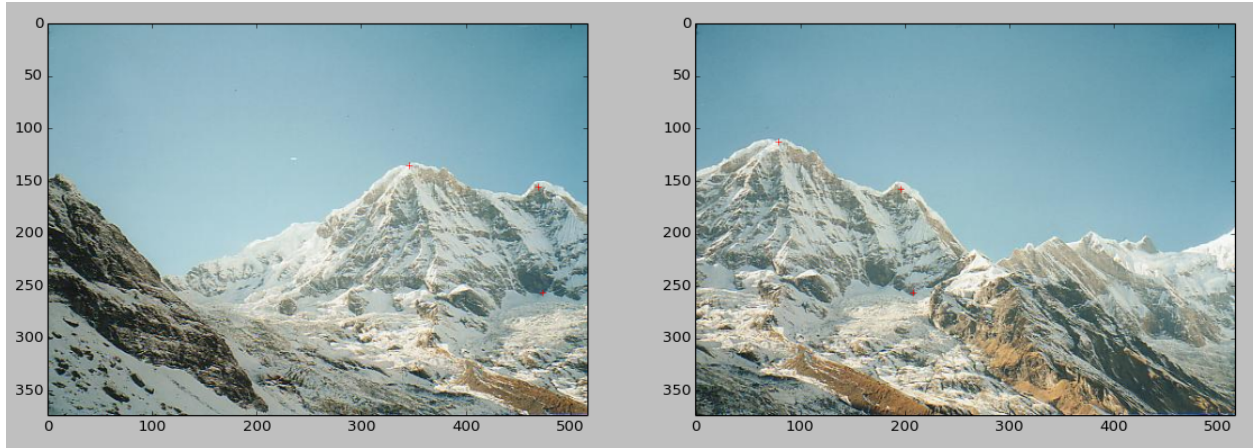
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## **Problem Statement**

Implementing an image stitcher that uses image warping and homographies to automatically create an image mosaic. We have two input images that should form the mosaic, where we warp one image into the plane of the second image and display the combined views

## **Getting correspondences**

The provided code to get manually identified corresponding points from two views using ginput is used



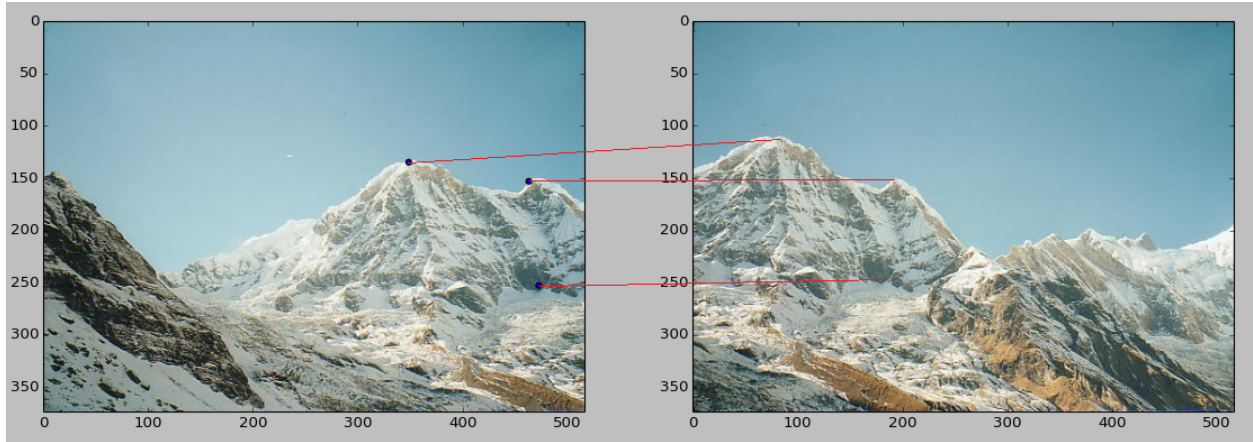
## Computing the homography parameters

We set up a solution using a system of linear equations  $Ax = B$ , where the 8 unknowns of  $H$  are stacked into an 8-vector  $x$ .

```
input points <-- user input  
adjust A  
adjust X  
compute B using least square algorithm
```

## Homography matrix verification

The homography matrix is verified using visualization plot, the two images are displayed, then on clicking on a point from one image, the corresponding point ( $p'$ ) in the other image is calculated using the equation  $p' = Hp$ , then plot  $p'$ .



## Warping between image planes

```

for each pixel in img1
  transformed pixel <-- Homography matrix * pixel Homogeneous dimensions
  convert pixel to cartesian coordinates
  result[pixel.x][pixel.y] <-- pixel intensity
  for each pixel in 8 neighbors of current pixel in result
    original coordinated <-- Homography inverse * neighbour
    neighbour <-- img1[original coordinates]
  end for
end for
repeat empty boundaries

```

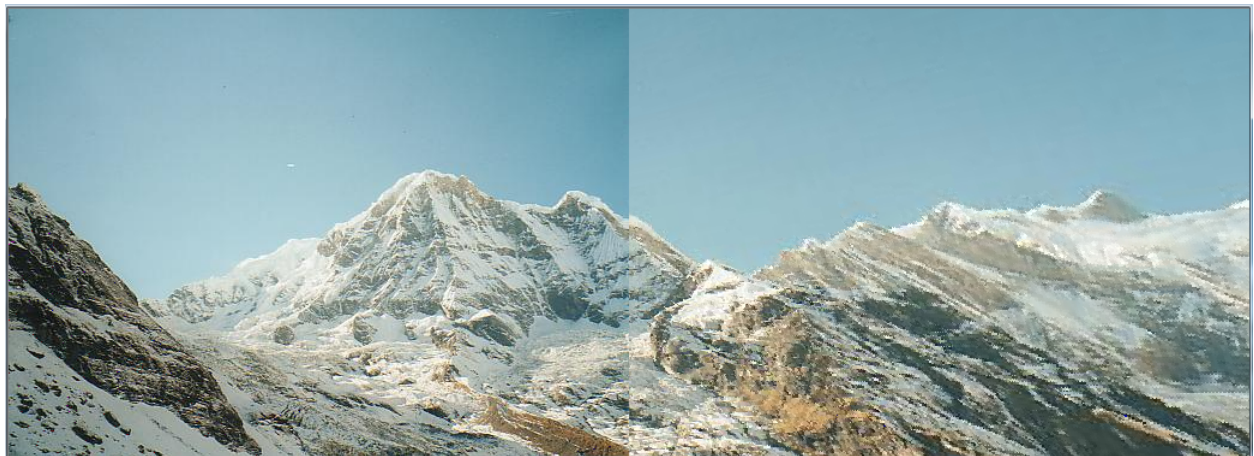
## Sample runs



(a) First View



(b) Second View



(a) First View



(b) Second View

