CamScanner using OpenCV

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In this project we are going to use OpenCV to imitate the functionality of CamScanner, the popular document scanning app. We shall do a feature based image alignment to achieve the same. In this technique a sparse set of features are detected in one image and matched with the features in the other image. A transformation is then calculated based on these matched features that warps one image on to the other.

1 Steps:

1.1 Locating correspondence points

Correspondence points are a set of points in one image which can be identified as the same points in another image. We locate one set of points in the image to be scanned. The other set is obtained from the desired size of the output image.

1.2 Finding Homography matrix

Homography is a 3x3 matrix, essentially, a linear transformation that relates two images of a scene. If we know the homography, we can apply it to all the pixels of the image to be scanned to obtain a warped image that is aligned with the desired output image. Since we obtained 4 sets of correspondence points in the two images, we can pass them into the cv2.findHomography() function to get a perspective transformation.

1.3 Warping the scanned image

Once an accurate homography has been calculated, the transformation can be applied to all pixels in the scanned image to map it to the desired image. This is done using the cv2.warpPerspective() function in OpenCV.

2 An Example

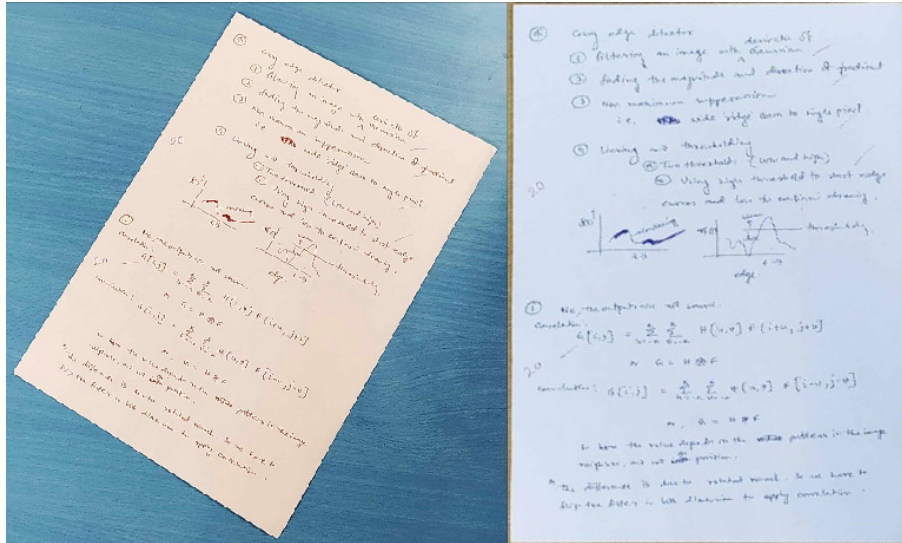Figure 1: (a) The scanned image   (b) The resultant image

3 Reference

- Mallick, S., "Feature Based Image Alignment using OpenCV (C++/Python)"