HW3 - Writeup

Computer Science and Engineering

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Part 1

**H = compute\_h(p1, p2)**

p1 and p2 is N×2 matrices of corresponded (x,y)T coordinates between two images.

Suppose p1 is (, ), (, ), (, ), (, ) and p2 is (, , (, , (, , (,

for each correspondence point, we can write 2×9 matrices such as

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To compute PH = 0, we can matrix multiplication like that:

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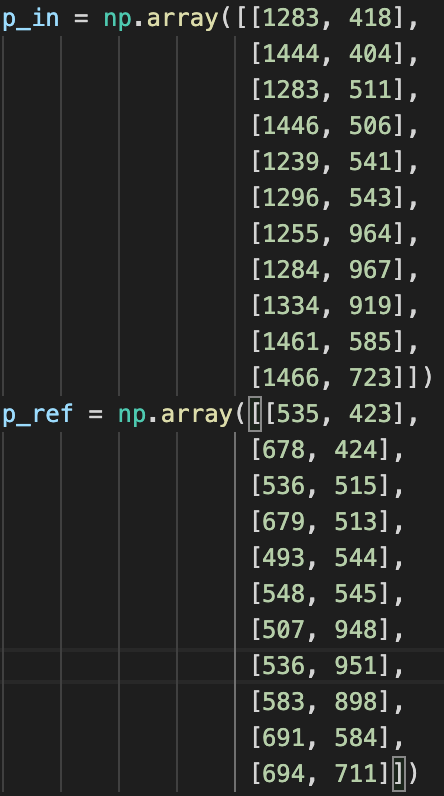
To get H, compute SVD and get last singular vector of as H. Then reshape H to 3×3 matrix.

**H = compute\_h\_norm(p1, p2)**

I expressed normalization as a matrix. A shape of normalization matrix is equal to that of p1. p1 is divided by 1600 and p2 is divided by 1200. Then compute H with normalized p1 and p2.

Part 2

**p\_in, p\_ref = set\_cor\_mosaic()**



p\_in and p\_ref is N by 2 matrices of corresponded coordinates between two images.

**igs\_warp, igs\_merge = warp\_image(igs\_in, igs\_ref, H)**

This function warp igs\_in to view of igs\_ref. First, compute corresponding coordinate in igs\_in to view of igs\_ref. And for each pixel, compute np.linalg.solve(A, b) to get t matrix for affine transformation. Then we can get igs\_warp image. Then arrange igs\_warp and igs\_ref to igs\_merge in proper position for panorama image.

Part 3

**c\_in, c\_ref = set\_cor\_rec()**

텍스트이(가) 표시된 사진

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c\_in and c\_ref is N by 2 matrices of corresponded coordinates between two images.

**igs\_rec = rectify(igs, p1, p2)**

To normalize and compute H, normalize p1 and p2 and apply compute\_h function. Then produce igs\_rec, this method is equal to **warp\_image.** Difference is normalizing factor, 1920 and 1056, that is size of igs.