**Lab06**

**Oct 2022**

**Problem 1:**

The results of corresponding features are shown as below:

A picture containing text, outdoor

Description automatically generated

Inlier\_Ratio=0.8191

A picture containing text, indoor, wall, floor

Description automatically generated

Inlier\_Ratio=0.3067

A picture containing text, building, white, old

Description automatically generated

Inlier\_Ratio=0.5715

**Stitched Pictures**: With 4 different blending algorithms:

A picture containing sky, outdoor, track, building

Description automatically generatedA picture containing sky, outdoor, track, building

Description automatically generated

A picture containing sky, outdoor, bridge, track

Description automatically generatedA picture containing sky, outdoor, track, building

Description automatically generated

A picture containing text

Description automatically generated

A picture containing text

Description automatically generated

A picture containing text

Description automatically generatedA picture containing text

Description automatically generated

A picture containing text, building, outdoor, city

Description automatically generatedA picture containing text, building, outdoor

Description automatically generated

A picture containing text, building, outdoor, government building

Description automatically generatedA picture containing text, building, outdoor

Description automatically generated

**Problem 2: Triplet Views**

A picture containing outdoor, grass, field, white

Description automatically generated

A building next to a body of water

Description automatically generated with low confidence

**Problem 3:**

Q1: compared with RANSAC, the least-square algorithm is much more sensitive to outliers. The outliers which are bad data, and we try to minimize the squared errors, the bad data will take up a large portion of the total error. In this way, the output matrix will be influenced too much by the outliers instead of expected inliers accuracy.

Q2: The four points shouldn’t be linear correlated. Since the equation which we use to get H are as follows:

Text, letter

Description automatically generated

It is actually a aH=0 problem, then if the rows of left first matrix (8\*8) is linear correlated, then we can get the only H. Practically speaking, every two corresponding points make a pair, and solve 2 unknown Matrix elements (8 in total, h33 normally is 1), thus 4 pairs are necessary but they have to be linear uncorrelated.

**Problem 4:**

I’ve tried features using SSD and NCC, the result are as follows: (Left: SSD; Right: NCC)

A picture containing sky, outdoor, building, bridge

Description automatically generatedA picture containing sky, outdoor, track, bridge

Description automatically generated

A picture containing text

Description automatically generated

A picture containing text

Description automatically generated

The results of these two sets are fine, but it doesn’t work with the city hall set, the correspondence failed, part of the reasons I think is they share many different corner features such as the right building, pedestrian lights, and carriage. These lay much influence on the matching process, thus the inlier ratio can’t represent well about the similarity.

A picture containing text, white, old, drawn

Description automatically generated

The SSD and NCC algorithms may come out with better estimation on the homography matrix than SIFT under some circumstances. Since the corners are sharper. And comparing with SIFT, the corner features are much less, they may be less computational demanding.

A picture containing text, indoor

Description automatically generated

NCC & SIFT

The NCC’s H is more accurate which can be seen form details in some sets.