note @13 113 views

# Instruction pipeline and requirements for hw1

In this homework, you are required to take several pairs of perspective images in our university, calculate the homograph and stitch them into one panorama.

**Here we provide a simple pipeline.**

You can only use the standard library (like imread, imwrite) unless otherwise stated.

1. Take serveral images on our campus.
2. Compute SIFT/SURF or any discriptors you like. You can use any library for this step.
3. Find the matches between any two images. Demonstrate the matched pairs in your report
4. Calculate homograph H with RANSAC.
5. Stitch the images together. You can use cv2.warpPerspective() in this step.

Please evaluate your results with at least 3 pairs of images (stitch >=4 images into one panorama).

Note that homograph holds only true under the planar assumption, that is, either your camera undergoes a pure rotation, or the scene is planar (e.g., indoor scenes).

Your report should include your results, how to run the code, and problems you found and your solution. Your new findings? etc.

**Also, please use the CVPR template(which we have provided in github classrom), other formats are not acceptable.**

**Submission**

Here are the things you need to submit:

**1. A PDF-formatted report which describes what you have done ->Gradescope.**

**2. Homework code for hw1 -> github classroom.**

For the first part, you should add CS172 course in your Gradescope. The course entry code is ***X355ND***. Later we will add hw1 report submission channel so that you can submit your report.

For the second part, you should accept this link https://classroom.github.com/a/SHb8Md7d to get the repo, which contains a README.md and a report template. **You SHOULD fill your name and your student ID into README.md,** otherwise we can't identify to whom this repo belongs and may give you 0 score for this homework. Please fill in your name and ID as soon as you clone the repo so that things mentioned above won't happen.

Besides, you should include all your code into a **zip file**, naming it as **hw1_studentID.zip(for example: hw1_2017123456.zip),** so that we can keep a copy of your homework.

**DDL: Oct 15, 23:59, 2021**

hw1

Updated 1 month ago by 李建平 and 吴笑寒

**followup discussions** *for lingering questions and comments*

◉ Resolved ○ Unresolved

**Anonymous Poet** 1 month ago

Can we manage the picture together by hands? Like save the processed picture and just do the stitching out of program. It's hard for me to stitch picture together use MATLAB ☹

helpful! | 0

**李建平** 1 month ago Could you please explain "by hands" more detailed?

good comment | 0

**Anonymous Poet** 1 month ago

Let the program save the image after doing the right homography translation, which is easy to see how to stitch them together and do it by using image processing software. I think it's only a small part of step 5.

helpful! | 0

**李建平** 1 month ago The homework is to help you understand the algorithm and its implementation. It is not forbidden to stitch the processed images together by hand but this part can be done by computer. Moreover, you should mention your approaches in the technical report and we will evaluate your completeness of the task.

good comment | 0

◉ Resolved ○ Unresolved

**Anonymous Atom** 1 month ago

Is it recommended to use Matlab of Python?

helpful! | 0

**李建平** 1 month ago There is no preference for the programming language.

good comment | 0

◉ Resolved ○ Unresolved

**Anonymous Helix** 1 month ago

Do we must form a panorama in the end? Or we just need to stitch 3 pairs of imgs?

helpful! | 0

**吴笑寒** 1 month ago Stitching is OK. But please remember that you have to stitch 3 pairs of imgs in to one bigger image. It doesn't mean that you stitch 3 pairs of images separately.

good comment | 0

◉ Resolved ○ Unresolved

**Anonymous Helix** 1 month ago

Do we need to put the sample images (stitch before and after) onto the report? (This may have to stick the pictures to the PDF directly instead of through latex?)

helpful! | 0

**李建平** 1 month ago It is needed to show your original images and the final panorama in your report. Inserting images in latex is available.

good comment | 0

**Anonymous Helix** 1 month ago And one pair is ok or all the three pairs are required to be included?

helpful! | 0

**李建平** 1 month ago It is up to you, but more results are better.

good comment | 0

◉ Resolved ○ Unresolved

**Anonymous Mouse** 1 month ago

Problems:

1. A pair of images means at least 4 pieces of images? If so, we need to evaluate at least 3 pairs of images means we need 12 pieces of images???

2. We need to stitch 4 pieces of images into one panorama???

3. In matlab, can we use functions like 'matchFeatures, matchedPairs, estimateGeometricTransform2D, imwarp', etc?

helpful! | 0

**吴笑寒** 1 month ago To your problem 1,2, you are required to stitch 4 images into one panorama, which is just formed by stitching pairs of images for three times.

For problem 3, you can use imwarp, but for the rest part you have to implement by yourself. In other word, only step2 and step 5 in the pipeline can you use the standard library functions,(and you have to implement other steps by yourself, because they are the tests for what you have learned in the class.)

good comment | 0

**Anonymous Helix** 1 month ago what does "only step2 and step5 in the pipeline can you use the standard lib funcs" mean? we cannot even use standard lib functions in other steps? but pipeline said we can use them right?

helpful! | 0

**吴笑寒** 1 month ago Sorry,my fault. What I want to express is that as an example, you can't directly use functions that can directly get the H instead of using ransac. Functions like that are strictly forbidden. Other functions that don't involve things like this are sure to be used

good comment | 0

◉ Resolved ○ Unresolved

**李建平** 1 month ago

The easiest way to evaluate tools you borrow is whether you have implemented RANSAC for matching and calculated transition matrix by yourself.

good comment | 0

◉ Resolved ○ Unresolved

**Anonymous Beaker** 1 month ago

How long does it take to execute the program? I'm not sure if I am caught in a loop.

helpful! | 0

**Anonymous Helix** 1 month ago If you use the photos directly taken by your phone, it is possible that the photos are tooooo large, which would lead to a bad behavior.

helpful! | 1

◉ Resolved ○ Unresolved

**Anonymous Calc** 1 month ago Using python, can I import math, random, numpy module during step 3 and 4?

helpful! | 0

**李建平** 1 month ago Please check the comments above first to avoid redundant questions.

good comment | 0

◉ Resolved ○ Unresolved

**李子昂** 1 month ago

In step 5 of stitching, I wonder whether the following three matlab functions are allowed to use: ‘projective2d‘, ‘imref2d’, ‘imshowpair’, since I think these functions won't influence the implementation of RANSAC or calculating of transition matrix which have been already done.

helpful! | 0

**李建平** 1 month ago Allowed

good comment | 0

◉ Resolved ○ Unresolved

**Anonymous Comp** 1 month ago When I am implementing Ransac, I get matrix H and use the Euclidean Distance between a transformed point to the pair to determine which are the inliers. But how can I recalculate the H according to the inliers? It seems that the "Total least square" tool can not be used.

helpful! | 0

**李建平** 1 month ago You have to solve the Ax=b which can be transformed into an optimization problem, then you will try to get the optimal matrix solution.

good comment | 0

Resolved Unresolved

**Anonymous Atom** 1 month ago

When can we get Instruction pipeline and requirements like this for **hw2** ?

helpful! | 3

Resolved Unresolved

**Anonymous Gear** 1 month ago

When can we get Instruction pipeline and requirements like this for **hw2** ? **+1**

helpful! | 0