! This class has been made inactive. No posts will be allowed until an instructor reactivates the class.

note 113 views

HW2: Image Alignment, Panoramas

Your goal is to create 2 panoramas:

1. Using homographies and perspective warping on a common plane (3 images).
2. Using cylindrical warping (many images).

In both options you should:

- Read in the images: input1.jpg, input2.jpg, input3.jpg
- [Apply cylindrical wrapping if needed]
- Calculate the transformation (homography for projective; affine for cylindrical) between each
- Transform input2 and input3 to the plane of input1, and produce output.png
- Bonus (!!): Use your Laplacian Blending code to stitch the images together nicely

Use the supplied code to work out through this assignment.
You have functions to get a cylindrical wrapping as well as calculate the geometric transform.

Submission guidelines:
Here are skeleton code, helper code and input images:
HW2Panoramas.zip

Use the provided code and usage examples to help you.
You final code for each case should be around 15-20 lines of python code (that's what my code is). In C++ you will need to add more LoC, but not much more.
Use the solutions key (watermarked) to see if you're in the right direction.

You'll find the following functions useful:

```
cv2.warpPerspective()
cv2.warpAffine()
```

Inputs are numbered: input1.jpg, input2.jpg, input3.jpg
Outputs should be:

- output_homography.png - for the projective stitch
  - Output image size should be: 1608 × 1312
  - Use `cv2.copyMakeBorder()` to add this padding to allow for space around the center image to paste the other (transformed) images:
  - ```
    out = cv2.copyMakeBorder(img1,200,200,500,500, cv2.BORDER_CONSTANT)
    ```
- output_cylindrical.png - for the cylindrical stitch
  - Output image size should be: 1208 × 1012
  - ```
    out = cv2.copyMakeBorder(img1cyl,50,50,300,300, cv2.BORDER_CONSTANT)
    ```

If you are going after the LPB for blending, make a separate set of outputs:

- output_homography_lpb.png
- output_cylindrical_lpb.png
- Here's (my) code to do LBP with masks: http://www.morethantechnical.com/2017/09/29/laplacian-pyramid-with-masks-in-opencv-python/

Make sure your output filenames match this convention.

// ==
Grading criteria for HW2
1. You should use the skeleton codes and do the implementation on it.
2. Do not change the output file names in skeleton codes.
3. An example of folder structure is uploaded under resources.

- Not complying to the folder structure to any extent will lead to 5 points off.
- A RMSD (Root of the Mean Squared Difference) function is supplied to calculate how different your results are from master images:
  - 0 - 20: full credits, 20 included
  - 20 - 35: (1 - (your score - 20) / 20) * full credits, 35 included
  - beyond 35: 0

  All questions regarding grading will not be answered.
- The same RMSD function will also be used to calculate the difference between the images in your "Results" folder and the outputs from running your program. If your program fails to run or produces images that do not match the ones in your folder, you will get 0 points.

The bonus question is optional, the award for bonus question is still under discussion. Make sure you also have correct outputs for standard methods even if you decide to do bonus questions.

Due: Thu 10/5 9:00 am. Submit on blackboard.

#pin

hw2 week5

Updated 3 months ago by Fan Wang and Roy Shilkrot

followup discussions *for lingering questions and comments*

Resolved Unresolved

Anupam Samanta 3 months ago Hello Professor, There seems a minor bug in main.py.
A closing curly bracket is missing in the end of function_launch list.

Fan Wang 3 months ago Thanks for pointing out. Already fixed.

Resolved Unresolved

Timothy Zhang 3 months ago
It seems that the following must be changed to make the python script run on the VM:

```
function_launch = {
1 : Perspective_warping(input_image1, input_image2, input_image3),
2 : Cylindrical_warping(input_image1, input_image2, input_image3),
3 : Bonus_perspective_warping(input_image1, input_image2, input_image3),
4 : Bonus_cylindrical_warping(input_image1, input_image2, input_image3)
}

# Call the function
function_launch[question_number]
```

Xuan Li 3 months ago I think the code should be as follows:

function_launch = {
1 : Perspective_warping,
2 : Cylindrical_warping,
3 : Bonus_perspective_warping,
4 : Bonus_cylindrical_warping
}
# Call the function
function_launch[question_number](input_image1, input_image2, input_image3)

The original version will run all four functions and store their outputs in the dictionary, and will throw an error : bool is not callable.

Anupam Samanta 3 months ago Yes.. That was causing a problem too.

Bhavya Ghai 3 months ago Ya, I am facing the same issue. Are we allowed to change code in main function?

Bhavya Ghai 3 months ago

```
function_launch = {
   1 : Perspective_warping,
   2 : Cylindrical_warping,
   3 : Bonus_perspective_warping,
   4 : Bonus_cylindrical_warping
   }

   # Call the function
   function_launch[question_number](input_image1, input_image2, input_image3)
```

This works for me

Dibyajyoti 3 months ago this doesn't work for me, the number from arg is read as string "1" whereas its 1 over here. I changed it to '1'.
Will check on container and change appropriately

Han Le 3 months ago Are we supposed to change the main() function and submit the code? I dont see any TA confirm yet.

Fan Wang 3 months ago You may change the codes in main() slightly to make it work without any problem. However, the input output formats have to be left intact. Our batch program will assume same interfaces for all submitted codes.

Raju Khanal 2 months ago @Fan : Can we comment function_launch altogether as running the code as python main.py 1 input1.png input2.png input3.png ./Results/ gives all the results anyways?

Resolved Unresolved

Dibyajyoti 3 months ago hi, just understanding the question.
Are we supposed to use the same three images with cylindrical wrapping? to stitch. I'm asking this as its mentioned "many images" in the bracket..are we supposed to get some more images?

Resolved Unresolved

Anonymous 3 months ago
What does -

`20 - 35: (1 - (your score - 20) / 20) * full credits, 35 included` mean ? For a RMSD score of 20.45 , (1-(20.45 - 20)/20) = 0.9775 will be the final score checked for the range ?

Resolved Unresolved

Raju Khanal 3 months ago Has the bonus question grade been finalized? If so how much is it worth?

Resolved Unresolved

Anonymous 3 months ago
Hi TAs, please create the link on Blackboard so we can submit our homework.

Roy Shilkrot 3 months ago Blackboard assignment is all set.