

## Homework #6 - Panorama - Due Friday July 12<sup>th</sup>, before 11:55pm

### Basic Description:

You will write code that takes in two images (left.jpg and right.jpg) and automatically creates a panorama from them. Your code will automatically detect feature points, calculate a homography/projective transform that will warp one image into alignment with the other, and then blend the two images together. You may use Gaussian pyramids or seam carving to do the actual blending.

### Programming Guidelines

Your code should be submitted as a file named assignment6.py. When we run your file on the command line (using “python3 assignment6.py”) it should load two files named “left.jpg” and “right.jpg” from the current directory. You may assume these are 3 channel (color) images and that the width and height of the images are the same (shot by the same camera and in the same orientation). You may assume that the two images have somewhere between 25-70% overlap in the “middle”, and that there are sufficient feature points to detect and find a reasonable match between them.

Your code should use OpenCV API functions to:

1. Detect feature points
2. Calculate the best fit homography to warp one image into the space of the other ( be sure to use RANSAC)
3. Warp one image into the space of the other.
4. Blend or cut the two images together using either your Gaussian Pyramids code or some form of seam carving.
5. Output the finished panoramic image (which may have some black border areas) containing both input images as “output.jpg”.

In addition to submitting your code, you should also submit a left.jpg and right.jpg image that you captured yourself, and used to test your code, along with the output.jpg that your code produced. *Please*

*DO NOT turn in the left and right sample images that we provided with the assignment.*

## Writeup

In addition to turning in the code, you need to produce a writeup PDF file that includes:

1. Your name and email address
2. Thumbnails of two input images that you captured and used to test your code, along with a thumbnail of an example output your code made from the images.
3. A discussion of how you ended up “blending” or “cutting” the two images together.

## Grading Rubric:

- Input / Output Images: 30%
  - Images are suitable for creation of a panorama (sufficient overlap, features for keypoint detection)
  - Output image “looks correct”, with no visible seam.
- Code: 40%
  - Code correctly detects feature points
  - Code correctly calculates homography
  - Code correctly warps images into alignment
  - Code correctly blends or seam-cuts the two images together
- PDF Writeup: 20%
  - Writeup includes thumbnails of the input/output images
  - Writeup describes how the code blends/cuts the overlapping images together