

## ECE5554 SU22 - Prof. Jones – HW 5

Due Wednesday, August 10, 2022 – 11:59 PM via Canvas

NOTE: Because the semester ends on August 12, you CANNOT submit this assignment after 11:59 PM, August 12 (there is not a full 3-day late period this time!)

In this assignment you will implement an image stitching algorithm, as discussed in lecture 9. Your code should accept a list of images, find the proper geometric transformations and combine them into a single resulting image.

So your program should load these images (these are available as rio1.png, rio2.png and rio3.png):



And save the result to disk, which should look like this:



I am giving you three sets of images to operate on: "rio-*n*.png", "blacksburg-*n*.png" and "diamondhead-*n*.png". They are in the "Image Files" section of the "Files" page in Canvas.

You are to write and test a Python/OpenCV program that will do the following:

1. For each of the image sets I have supplied:
  - a. Load the images and convert to grayscale.
  - b. Implement the image stitching process described in lecture 9.
    - i. Write the resulting transformation matrix to the console.

- ii. For each combination step, save an image showing the result of warping the second image in each pair into the coordinate system of the first image.
- c. Save the resulting combined image to a file.

Below is an example of console output (on the first pair of Rio images):

```
[[ 0.92081843  0.00783782 469.28750781]
 [ -0.10553407  0.98028752 1013.20232914]
 [ -0.00007215  0.00000362  1.          ]]
```

Be sure and obey proper practice for loading, converting and using image files.

You WILL be graded in part on how “nice” your final images look.

Your submission will consist of a Word or pdf file and a .py file (no .ipynb files) containing your code, as well as nine image files (for each image set, include the warped result images and the final combined image). Do NOT put all of your files into a zip file; attach them separately. Your Word file should contain:

- your complete Python code (pasted in as plain text, no screenshots or dark mode); and
- the console output of your program as described above, pasted in as plain text.