HOMEWORK 3
PANORAMA IAMGE GENERATION

CSED551 – COMPUTATIONAL PHOTOGRAPHY
SPRING 2025
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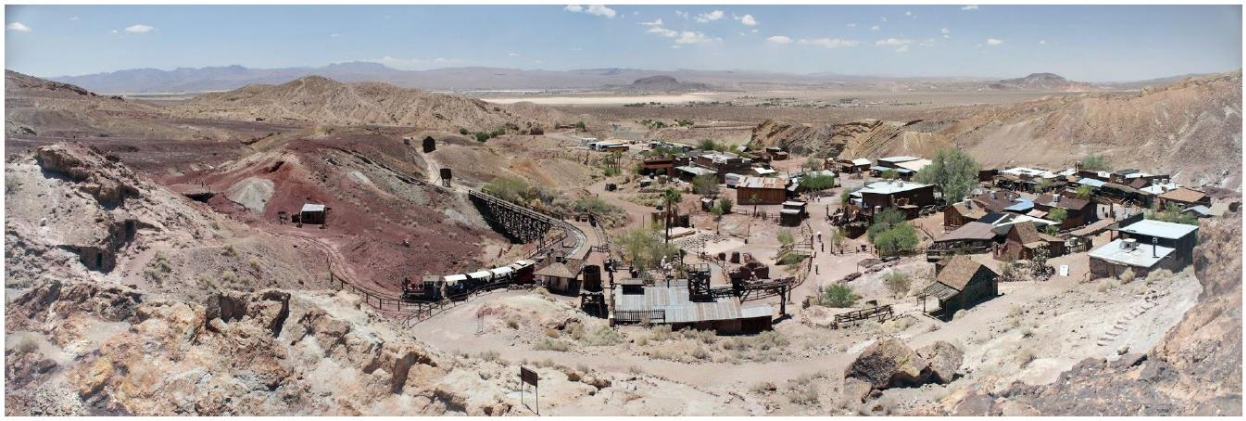
OVERVIEW

In this homework, you need to implement an automatic panorama stitching algorithm. Your code should be able to take not only two but an arbitrary number of images (N>=2) and generate a panorama image from them.



PANORAMA

The general pipeline for this homework includes the following steps:

1. Given N input images, set one image as a reference
2. Detect feature points from images and correspondences between pairs of images
3. Estimate the homographies between images using RANSAC
4. Warp the images to the reference image
5. Composite them

REQUIREMENTS

- You need to implement your own code for RANSAC. Do not use RANSAC functions provided by libraries.
- You can use other functions provided by libraries, e.g., for feature point detection, homography estimation from inliers, and image warping.
- The final panorama image should have no seams between stitched images. Use image blending methods such as alpha blending, multi-band blending, or Poisson image blending to avoid seams. Your homework will be scored based on the quality of your results.

Your report must include:

- Detailed discussion on your implementation
- Your results with a detailed discussion
- Limitations of the techniques that you found

You must upload a single zip file that contains the following to the LMS:

- code/ - a directory containing all your code for this assignment
- images/ - a directory containing your input images and their results
- report.pdf – your report as a PDF file

Due: April 27th, 23:59

Penalty for late submission

- 1 day: 70%
- 2 days: 30%
- 3 days: 0%

RUBRIC

- 40 pts: Image alignment
- 20 pts: Image blending
- 40 pts: Report

Your homework will be scored based on your report, and I am not going to compile or run your code. Thus, your report must include all necessary details of your implementation and results.