

# Assignment 2

COL-783

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This goal of this assignment is to construct panoramas by registering and stitching together multiple images of a scene.

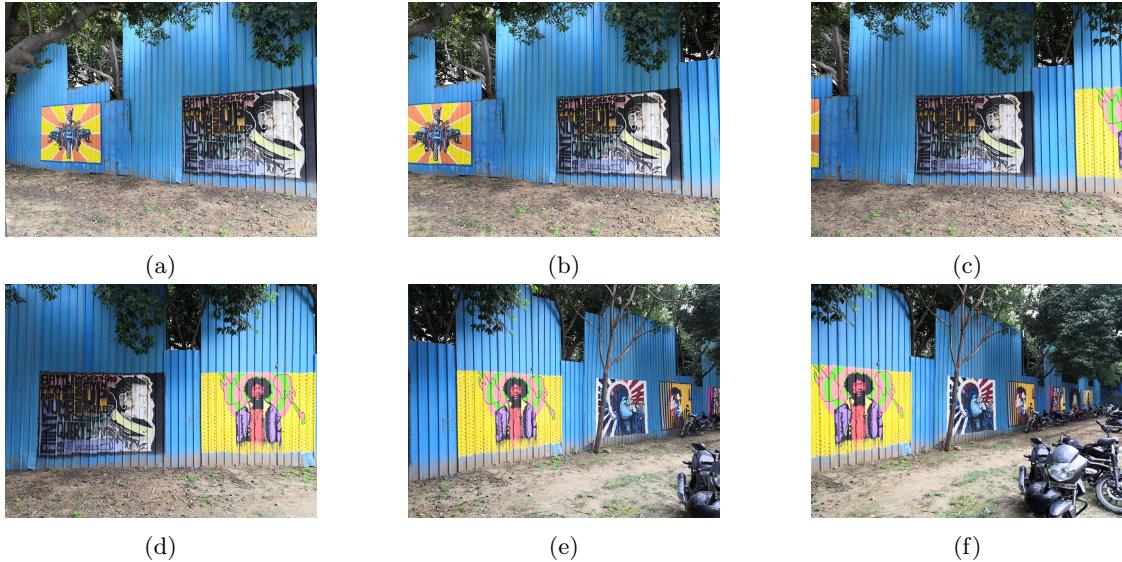


Figure 1: Input images



Figure 2: Output image

## 1 Algorithm Outline

You will be given a set of images of a scene. You need to perform the following steps:

### 1.1 Registration

Image registration is the process of overlaying two or more images of the same scene with respect to a reference image. It involves the following steps:

1. Feature extraction: You can use any descriptor of your choice available in OpenCV.
2. Transform model assessment: Parameters of the mapping function are to be estimated to align the images with respect to each other. Use the following transformation models:
  - Affine transformation
  - Homography
3. Image transformation: Finally, the image is transformed and aligned with the reference image in accordance with the parameters estimated.

## 1.2 Blending

After the images have been registered and aligned together into a single composite images, there are often visible seams between images at the image boundaries. You should generate seamless panoramas by blending together at the seams. Use the following methods for blending:

- Feathering
- Laplacian pyramid blending
- Poisson blending

## 2 Tasks

1. Write code to construct panoramas from the given four image sequences. Your code should take as input a string specifying the path to a folder containing the sequence of images to be stitched, and generate and save the output image in the directory containing the code.
2. Assess the quality of the panoramas created, and comment on why each image sequence is easy or difficult.
3. Click two additional difficult image sequences and construct panoramas. Analyse the difficulty of these sequences.
4. At the time of demo, you will be provided with a set of unseen images on which your code will be evaluated.

## 3 Rules

1. Write your own code. You are not allowed to use any in-built functions or open-source codes for registration or blending.
2. For feature extraction, you can use inbuilt descriptors in OpenCV.
3. You can do the assignment in groups of two, or individually.
4. You are not allowed to discuss or borrow code from other groups.

## 4 Submission Instructions

1. Your submission folder should contain:
  - Source code
  - Readme
  - Output files for all input image scenes provided

- Report
2. The report should contain:
    - a brief description of your method
    - output images
    - analysis and comparison of the different methods
  3. Zip the submission folder, rename the zip as <Member1-entry-number> - <Member2-entry-number>.zip and submit on moodle.
  4. Only one submission per team.

## 5 Evaluation Rubrik

Your evaluation will be based on

- Image registration - 3 points
- Image blending - 3 points
- Analysis of difficulty of sequences - 1 point
- Performance on unseen images - 2 points
- Report + demo - 1 point