Computer Vision: Assignment #3, Due date: March 10, 2021

The goal of this assignment is to write a simple panorama application for stitching together pairs of images.
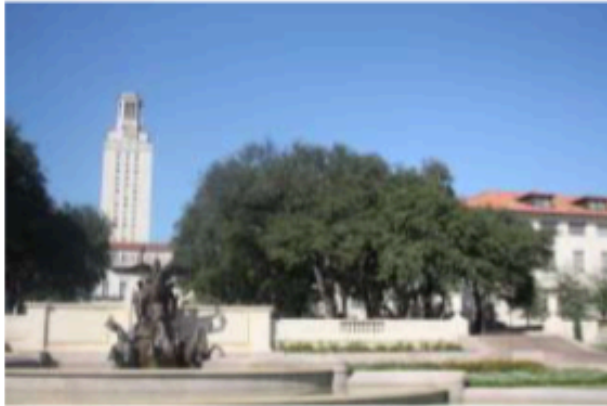

Figure A: Image 1   Figure B: Image 2

Figure C: Merged panorama image

Suggested steps (feel free to change, add, or remove steps as needed):

1.   Load both images and convert them to double and to gray scale.

2.   Detect feature points in both images. You can use Harris corner detector.

3.   Compute descriptors around every keypoint in both images.

4. Compute matches between every descriptor in one image and every descriptor in the other image. Then select the best matches.

5. Run RANSAC to estimate (1) an affine transformation and (2) a homography mapping one image onto the other. Warp one image onto the other using the estimated transformation. To do this, you can use maketform and imtransform MATLAB functions.

6. Create a new image big enough to hold the panorama and composite the two images into it. You can composite by simply averaging the pixel values where the two images overlap. Your result should look something like Figure C

General guidelines for programming assignments:

The marking of the implemented functions is based on the following general scheme:

- Correctness and logic 80%: the program logic should be correct and code is compiled without errors.

- Style 10%: codes should have comments and properly formatted.

- Optimization and simplicity 10%: codes should have reasonable implementation and should not be too complicated.