Department of Electrical Engineering and Computer Science

Project 4
(Due date: 06/09/2020)

The objective of this project is to implement the image registration technique. Given two images *image1* and *image2*, the aim is to register *image2* with respect to *image1*. The registration problem has to be solved by matching *SIFT* features extracted from the images.

Inputs: Given images, image1 and image2.

Output: image2 transformed with respect to image1 such that the difference between two images is minimum.

Tasks to be accomplished:

1. Extract SIFT features from images using a function from OpenCV library or any other library.
2. Match features using naive nearest neighbor approach (function to be implemented) and the second version of nearest neighbor approach - `cv2.BFMatcher()`.
3. Compute the transformation matrix (affine transformation).
4. Transform image2 such that it aligns with image1.
5. Compute registration error for both feature matching methods.

Analysis question:
Which feature matching algorithm works better and why?

Notes:

- The project should be implemented in Python.
- Only one single file should be submitted through Blackboard for evaluation, which includes:
  - ✓ The project report that includes the methodology, equations used, implementation results and discussion, conclusion, appropriate technical references, etc.
  - ✓ The program codes along with the dataset used for testing and validation.
- Late submissions will not be accepted.
- Email submissions will not be accepted.