BIL 415 - Image Processing Practicum

HACETTEPE UNIVERSITY
Department of Computer Engineering

Problem Set 3
Fall 2021-2022
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Due Date: 23:00 pm on Tuesday, December 28, 2021

Generating Panorama Images

Image 1

Image 2

Image 3

Stitched Image

In this assignment, your goal is to generate panoramic image by stitching multiple images as in Figure 1. You will implement stitching to generate panoramic images. The details of the assignment is given below:

The Details

The program combines a given set of images into a larger image by registering, warping, resampling and blending them together. For this assignment you will stitch the given set of images which you should assume that they contains the the same object/view from different angles, to compose a panoramic image.

- The given program takes a group of images as input. You should assume that the listed images are given in an order (left to right) as a part of panoramic image.
- The most important part that you have to implement for this assignment is the merging part. You have to implement image pyramid to merge processed images.
- The main steps of the algorithm is given below:
  1. Read all of the images in an order
  2. Align consecutive images via feature matching. For this purpose you may use SIFT features and RANSAC(you can use related libraries).
  3. Merge images via blending (you have to implement this part)

What should you write in the report?

- Explain the each step of the algorithm. Why can SIFT features be used for? What is the purpose of the RANSAC algorithm? Why are they used for?
- Can you use different methods to merge images? What are the advantages of the blending compared to other methods?
- How can you improve the results?
- Change the parameter for the image pyramid level and comment about the effects of it.
- Change the parameter for bluring parameter and comment about the effects of it.
- Explain with qualitative result of the implementation if necessary.

Grading

The assignment will be graded out of 100:

- **Total 100:** CODE: 0 (no implementation), 5 (a partially correct solution), 30 (a correct solution) and REPORT: 70

Academic Integrity

All work on assignments must be done individually unless stated otherwise. You are encouraged to discuss with your classmates about the given assignments, but these discussions should be carried out in an abstract way. That is, discussions related to a particular solution to a specific problem (either in actual code or in the pseudocode) will not be tolerated. In short, turning in someone else's work, in whole or in part, as your own will be considered as a violation of academic integrity. Please note that the former condition also holds for the material found on the web as everything on the web has been written by someone else.