

Project 2 Report

Task 1:

Feature detection was done using ORB and feature matching was done with the logic that matchers use the Euclidian distance between the descriptors to see which points match the best by setting the best match to be the points with the minimum distance between them.

Thus, I used the Euclidian formula

$$d(\mathbf{p}, \mathbf{q}) = \sqrt{\sum_{i=1}^n (q_i - p_i)^2}$$

p, q = two points in Euclidean n-space

q_i, p_i = Euclidean vectors, starting from the origin of the space (initial point)

n = n-space

to compare descriptor distances, extract the minimum values and comparing it for the best match.

(BF- matcher is also included in the code as the matcher code I did from scratch did not work like It should, as I faced some problems in indexing the elements) After the translation, transformation (from perspective of image 1 → image 2) was done we found the homography and warped the images together. The foreground removal was a bit tricky, but I used OpenCV's HOG detector to detect the foreground as it was a person, I used HOG_random person_detector and looked for the pixel intensities which were different from image 1. If they did not match, they were replaced by the pixels of previous image, thus eliminating the foreground.

Task 2:

The code for task 1 was reused for this task as well with some minor changes. As we're dealing with multiple images, I looped over the list of images to find the best match (so image 1 was matched with all other images and say it matches best with image4 I get H14) and merged them together and saved them in another list, now we had images which matched the best merged in a list and then merged them together. The panorama output was too large to display so the merged images were resized to fit the output display.