

Report on Laboratory 6  
Image matching  
Computer Vision UniPD

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# Setup and instructions to run the code

**BEFORE PROCEEDING: THIS AN EXTRA REPORT THAT I AM WRITING. THERE ARE THREE MORE DETAILED REPORTS THAT I HAVE SUBMITTED BEFORE.**

**OS:** Linux (Pop!\_OS)

**Enviroment:** CLion

**CMake:** 3.27.8

**OpenCV:** 4.5.4

The main code that elaborate the task is named `main.cpp`. The header file `FeatureMatcher.h` can be found in the `/include` directory, while its source code in `/src`. The images to be load are found in the `\Images` folder.

To run the code simply extract the content of the .zip file and run in the terminal:

1. `cmake .`
2. `cmake --build .`

This will create a `imageMatching` executable; run it and pass as `argv[1]` the name of the first image, which must be in the `Images` folder. As `argv[2]` the second image, while as as `argv[3]` and integer that represents the type of image feature matching and feature detection+description used.

The type of analysis that I have implemented are :

- FLANN feature matching with SIFT feature detection+description (provide 0 as `argv[3]`)
- FLANN feature matching with SURF feature detection+description (provide 1 as `argv[3]`)
- Brute-Force feature matching with KAZE feature detection+description (provide 2 as `argv[3]`)
- Brute-Force feature matching with ORB feature detection+description (provide 3 as `argv[3]`)
- Brute-Force feature matching with SIFT feature detection+description (any other integer)

The policy used to see if the image is the same or with strong transformation is to look at the number of good matches (calculated through the ratio test) and setting general valid thresholds.

In the next page, some of the results I have obtained. Overall, Brute-Force with KAZE seemed the most reliable with better feature detection and matching.

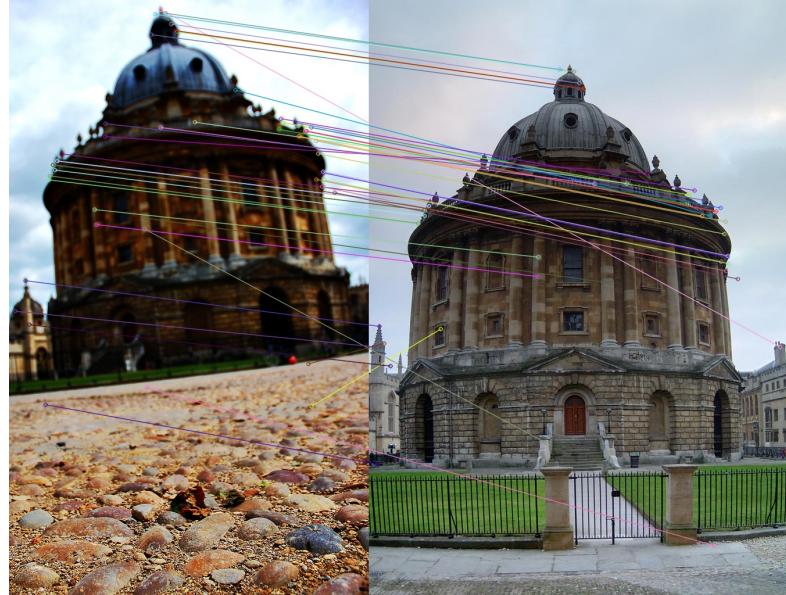


Figure 1: Brute-Force with KAZE (same image with strong transformation)



Figure 2: FLANN with SIFT (different image)



Figure 3: FLANN with SURF (same image)



Figure 4: Brute-Force with KAZE (same image)



Figure 5: FLANN with SIFT (same image)

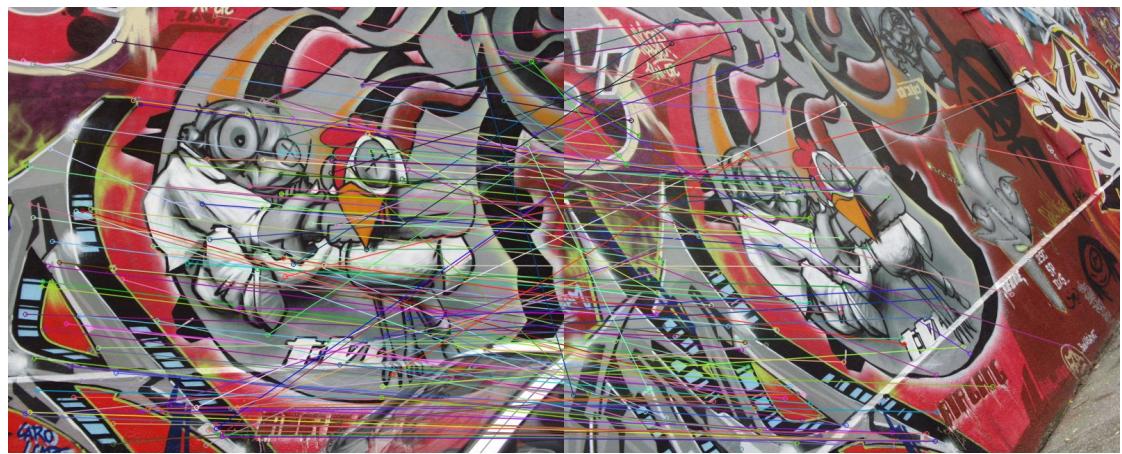


Figure 6: Brute-Force with SIFT (same image)

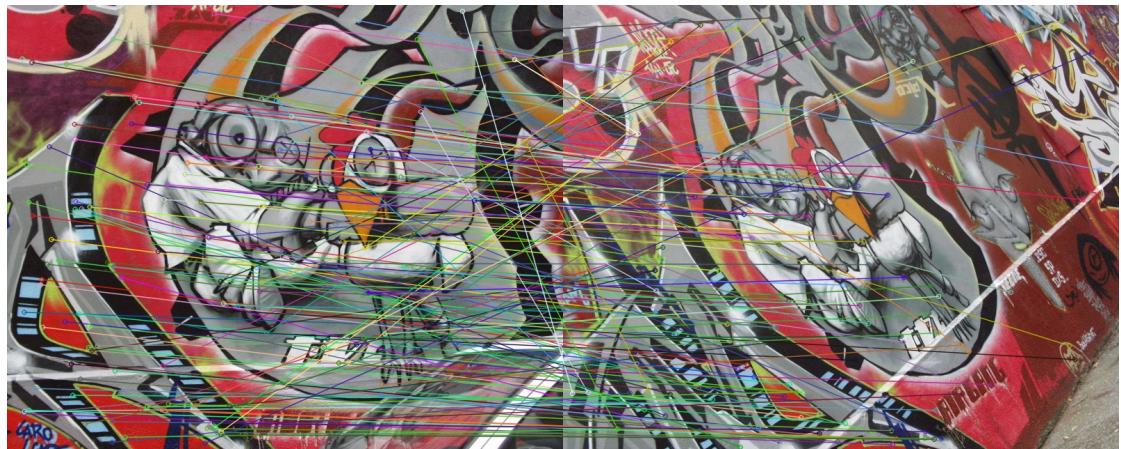


Figure 7: FLANN with SIFT (same image)

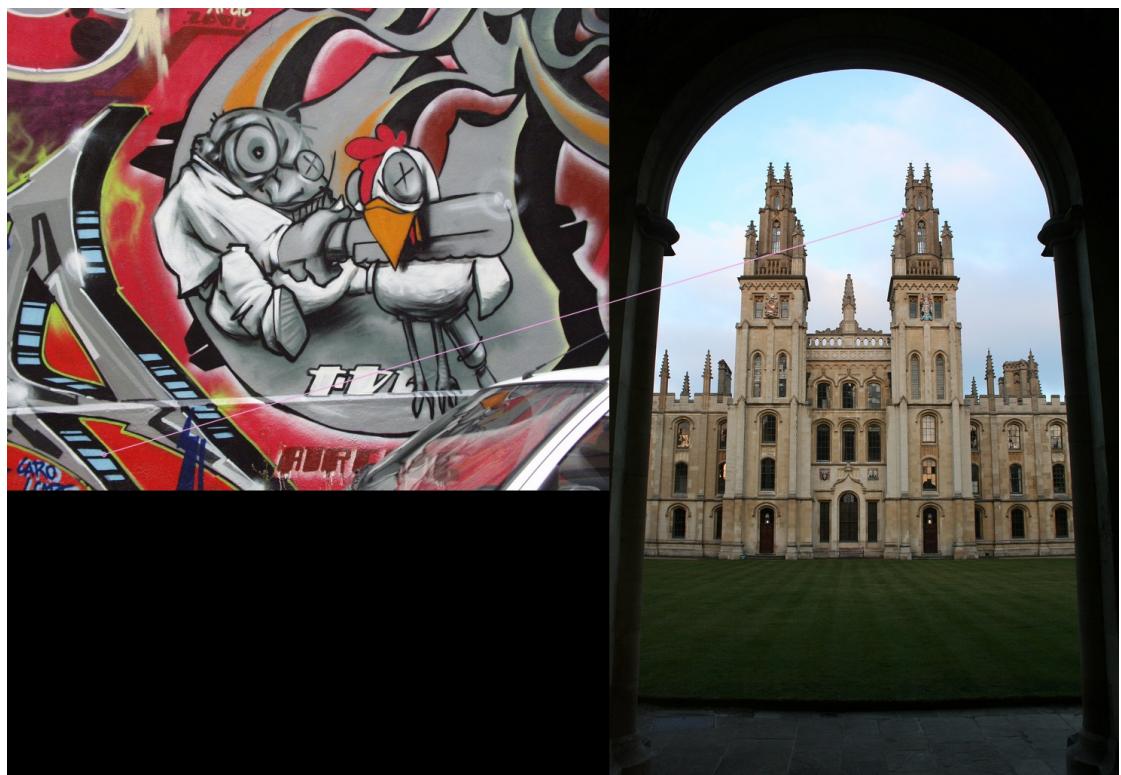


Figure 8: Brute-Force with ORB (different image)