

CENG 391 Introduction to Image Understanding

November 17, 2016

Measuring Recognition Rate with BRIEF descriptors

Write a C++/Python program that operates the following tasks.

1. Read the images
 - "img1.ppm"(reference image),
 - "img2.ppm", "img3.ppm", "img4.ppm", "img5.ppm", "img6.ppm" (test images)
2. Parse the given ground-truth homography files: "H1to2p", "H1to3p", "H1to4p", "H1to5p", "H1to6p".
Note : H1to2p file belongs to homography from reference image(img1.ppm) to img2.ppm.
3. Extract FAST keypoints on the reference image and compute BRIEF descriptors of them.
Note : – Create FAST detector and BRIEF descriptor extractor by using **create()** method of OpenCV.
 - Detect keypoints by calling **detect()** method of OpenCV.
 - In order to compute descriptors of corresponding keypoints, **compute()** method of OpenCV should be used.
4. Transform reference FAST keypoints to each of the test images by corresponding homography and compute BRIEF descriptors of them.
5. Construct correspondences from each reference keypoint to the each of the test images.

6. For each reference keypoint, search the test descriptor that gives the minimum Hamming distance to it as it is shown in Figure 1. Then, compute recognition rate as follows:

$$RecognitionRate = \% \frac{NumberofInliers}{NumberofKeypoints} \quad (1)$$

7. Write recognition rate for each of the test images to the file "RR_results.txt" as in the following format:
1to2 %...
1to3 %...
1to4 %...
1to5 %...
1to6 %...

Correspondences (Reference image to I2)

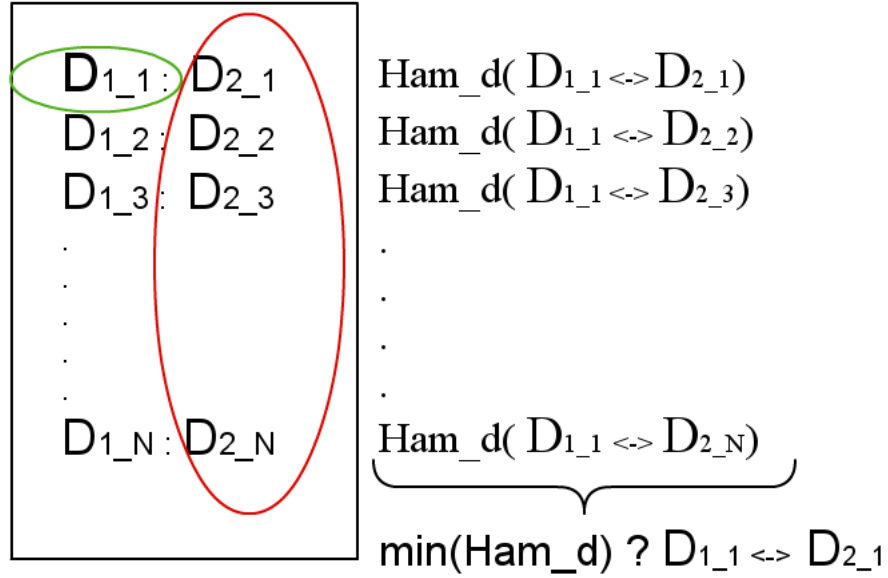


Figure 1: Recognition rate measurement.