Computer Vision

Report - Lab 5

Keypoints, Descriptors and Matching

Bressan Giulia

I.D. 1206752

A.Y. 2018/2019

1 Projection in a cylinder surface

The first step of the assignment was to project the set of images in a cylinder surface. To do so, the given static method cylindricalProj() of the PanoramicUtils class was used.
The parameter given to the method was the angle which corresponded to half of the Field of View of the camera, in our case 33° (66° was the FoV of the camera).
In Figure 1 we can see an image before and after the projection, that allows us to treat the superimposition of two subsequent images as an horizontal translation.

Figure 1: *Original image (left) and image projected in cylinder surface (right)*

2 ORB features

The next task was to extract the ORB features, with the detectAndCompute() method of the ORB class. This method gives as an output the keypoints and the descriptors for each image. These are used as an input for the matching of the features.
The matching was done using the BFMatcher class, with the method desc_matcher(), setted with the "NORM_HAMMING" distance function.
The obtained matches were refined by setting a threshold on the matching distance, equal to a "ratio" value (equal to 8, for example) multiplied by the minimum distance among the matches (Figure 2).

3 Translation

Using the findHomography() function, setted with "RANSAC" as third parameter, the set of inliers was found. The mask given as output of the

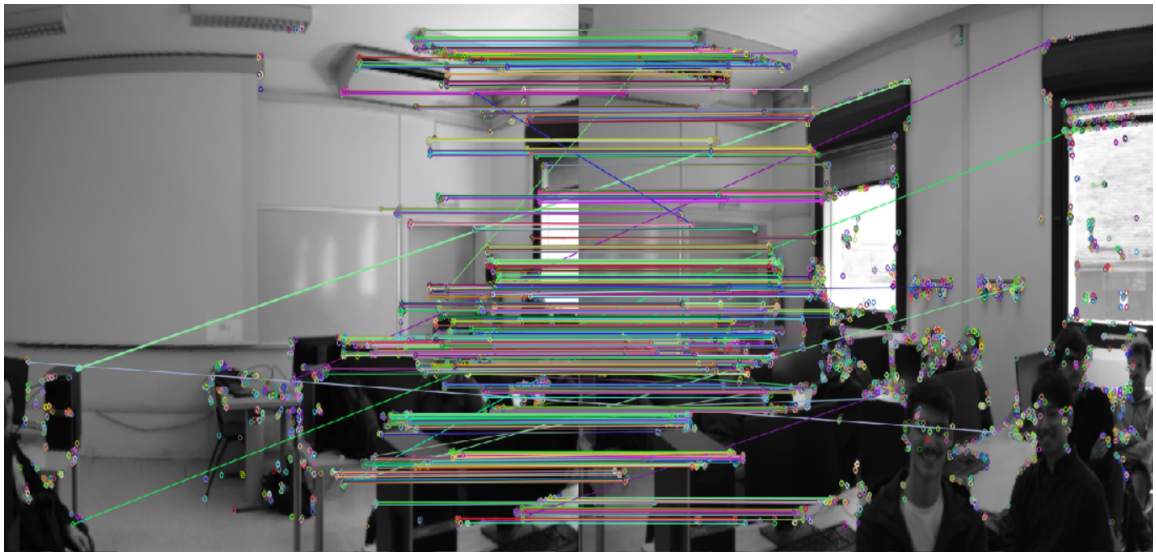

Figure 2: *Refined matches with "ratio" value equal to 8*

function was used to select only the useful matches, by discarding the ones pointed with the value "0" in the mask vector.
The mean value of the x in the good matches was computed, for each subsequent image, in order to find the right value for the translation.
This translation value was used to crop images and stitch them one after the other, to create the final panoramic image, as shown in Figure 3.

Figure 3: *Final panoramic image*