

REPORT:

1) First of all, I chose 5 points from the florance2 image with the click method, you can see it from the click_part1.py file. You can see the pixel coordinates in the coordinates_of_second_image_points.txt file.

We obtained the epipolar lines by multiplying the fundamental matrix by the pixel coordinates. After fitting the 3×1 (a,b,c line constant) matrix we obtained with the line fitting method, we can draw our epipolar lines using the equation " $au + bv + c = 0$ ". You can see it from the part1_2.py file.

2) First of all, I chose 5 points from each the florance2 and florance1 images with the click method, you can see it from the click.py file. You can see the pixel coordinates in the coordinates_1 (for florence1) and coordinates_2 (for florence2) files.

We obtained the epipolar lines by multiplying the fundamental matrix by the pixel coordinates. After fitting the 3×1 (a,b,c line constant) matrix we obtained with the line fitting method, we can draw our epipolar lines using the equation " $au + bv + c = 0$ ". This process has been done for both florance1 and florance2. Thanks to this, I was able to see two epipolar lines passing through each point on florance3. This gave me the points we chose in florance1 and florance2, namely the epipole points in florance3 (The name of this process is epipolar transfer). You can also see it from the part2.py file.

3) The size of a pixel on the surface of the area that you are trying to model is critically important so we need to calculate what pixel size we are going to get with a given camera and lens at a given working distance. Compare the scale of the image and the scale of the object: the ratio between them is the same as the ratio between the distance d and the focal length f , therefore the ratio between the size of a pixel on the image sensor and the size of a pixel on the object is *also* the same ratio. So; we have 2 images. The pixel sizes of the points we have selected in both images (florance1 and florance2) will not be the same. Therefore, the desired point in the 3rd image (florance3) may not coincide in the right place. The question is "How do we know what the image accuracy should be?". This one is a bit harder to answer because it depends on a few factors, like the quality of the images (noise and blur) and the accuracy of the camera calibration.

Gökçe Yağmur Budak

21732948