ENGN 2560

Lab #01 Camera Calibration, Camera Projection, and Image Features

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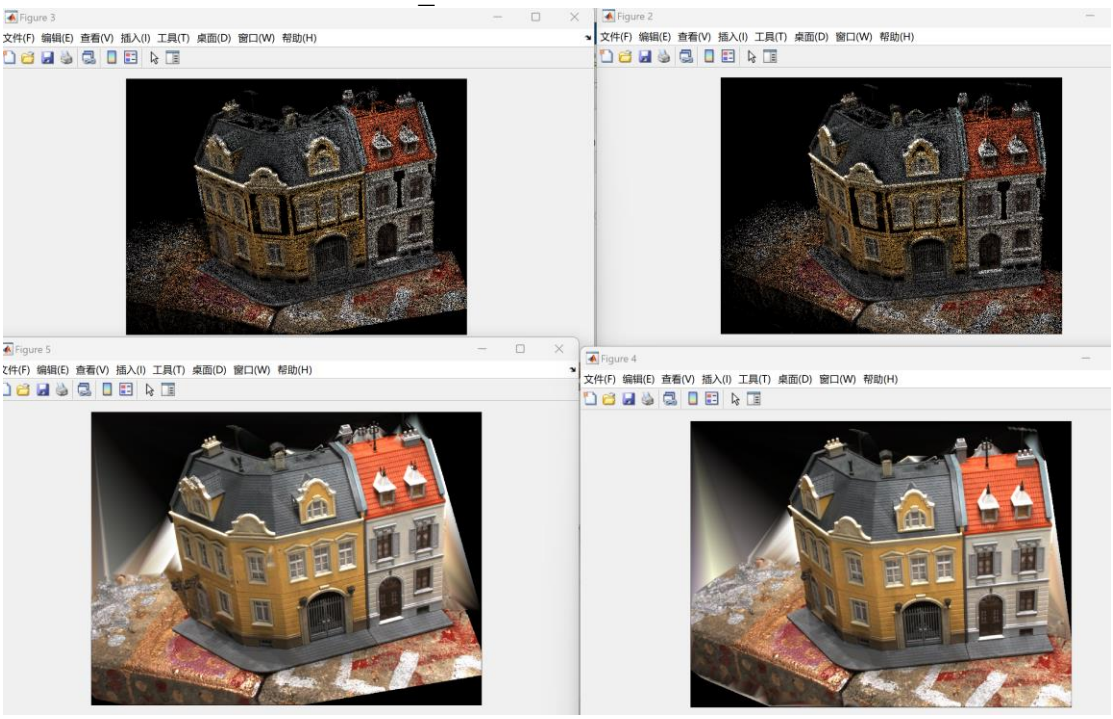
Problem 1. Image Formation by Camera Projection

The code for this result is in “P1_main.m” file.



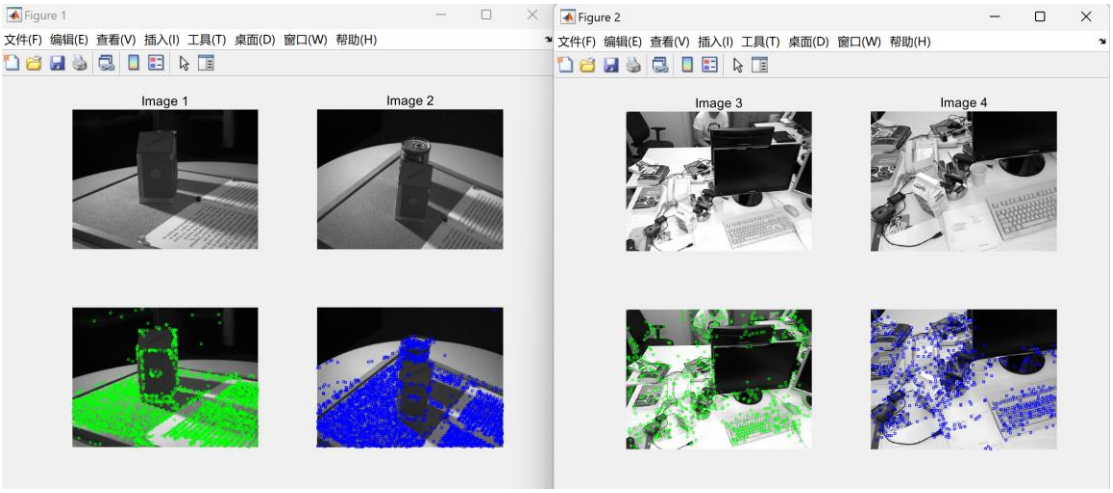
Problem 2. Calibrate Your Camera

Because the projection of the checkboard onto the plane is homologous. Therefore, it is only related to the extrinsic matrix of the camera and the position of the checkerboard plane, but not to the intrinsic matrix of the camera.

When you move the camera and change its extrinsic matrix, you can get the same image as the original image by adjusting the camera's intrinsic matrix accordingly. This means that there are many different combinations of intrinsic and extrinsic matrix that can produce the same homography and image.

Problem 3. Image Features

The code for this result is in “P3_main.m” file.



Do you think SIFT features have high repeatability rate, namely, the same feature appears at the same place across the two images?

Yes, from the results, I think the repeatability rate is quite high.