

CV2015Spring—Assignment #2

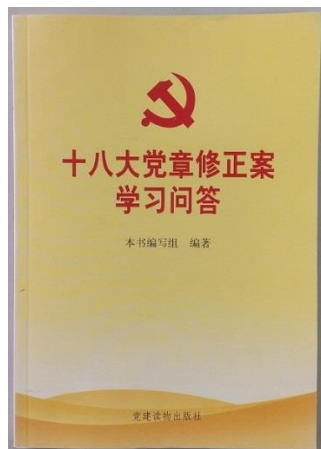
Due: Thursday, Apr 30 10:00 AM

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1.1 Step 1: Input image

The object image and scene image is given. Firstly, I input the two images.



(a)



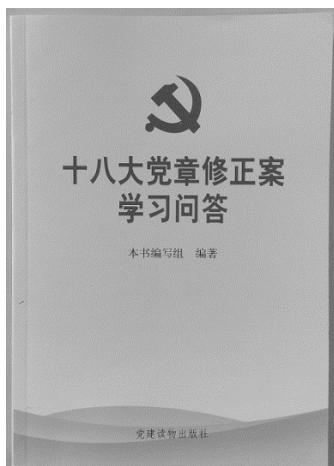
(b)

Figure 1: Input image.

1.2 Step 2: Color space conversion

I converse the color space from RGB to GRAY by rgb2gray function .Convert

RGB image or colormap to grayscale.



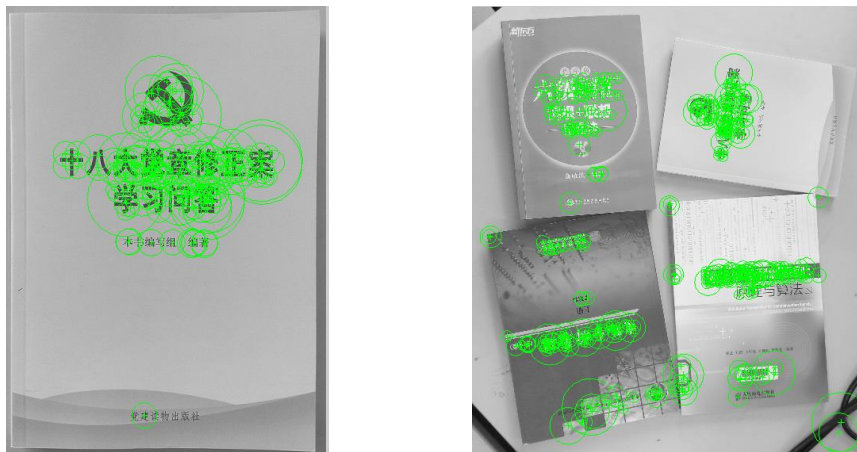
(a)

(b)

Figure 2: grayscale images

1.3 Step 3: Features2D detection

There are lots of Features2D detection algorithms, such as SIFT, SURF and so on. I choose SURF which is stable and efficient. I detect feature points in both images. Visualize the strongest feature points found in both images.



(a) 150 Strongest Feature Points from Object Image

(b) 350 Strongest Feature Points from Scene Image

Figure 3: Features 2D detection

1.4 Step 4: Calculate descriptors

We used the extractFeatures function to extract feature descriptors at the interest points in both images.

1.5 Step 5: Match descriptors

We used matchFeatures function to match the features .Now, we display matched features.



Figure 4: Match descriptors (Including Outliers)

1.6 Step 6: Geometric transformation

We used `estimateGeometricTransform` function to estimate geometric transformation from matching point pairs. The type of transform is affine. It can eliminate outliers. Display the matching point pairs with the outliers removed.

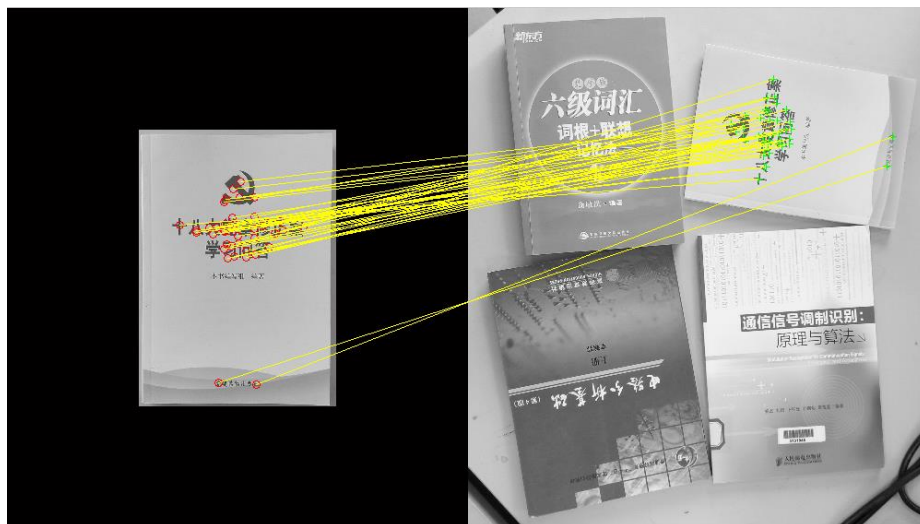


Figure 5: Match descriptors (Inliers only)

1.7 Step 7: Localize the object

Firstly, We should get the bounding polygon of the object image. Then, we

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localize the object from the scene by using the transformPointsForward function.



Figure6: Detected Object