CV2015Spring—Assignment #2

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1. The process of this assignment

I use Xcode as IDE, use C++ and OpenCV library to finish this assignment.

1.1 Step1: Input image

I use the default images to finish my assignment. So I input them at first.

(a)   (b)

Figure 1: Object image and Scene image.

1.2 Step 2: Color space conversion

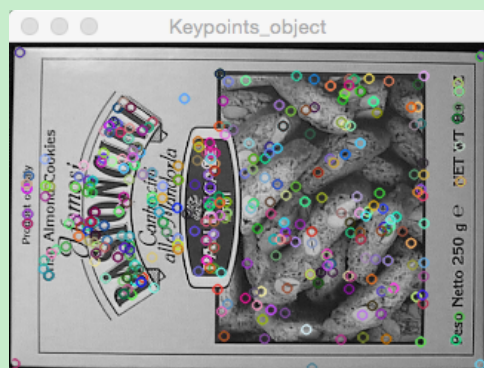I use "cvtColor" function to converse the color space from RGB to GRAY.
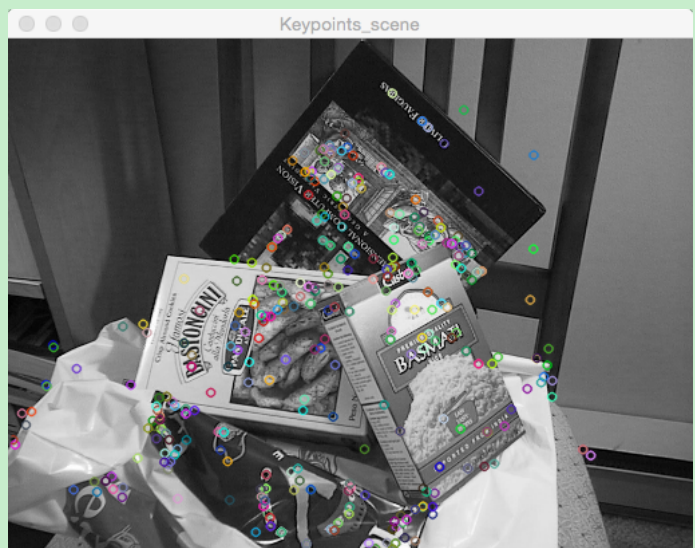
(a) (b)

Figure 2: GRAY images

1.3 Step 3&4: Features2D detection and calculate descriptors

I use "SIFT" function which is included in OpenCV_Contrib library to detect the keypoints of object image and scene image. SIFT is one of Features2D detection algorithm.
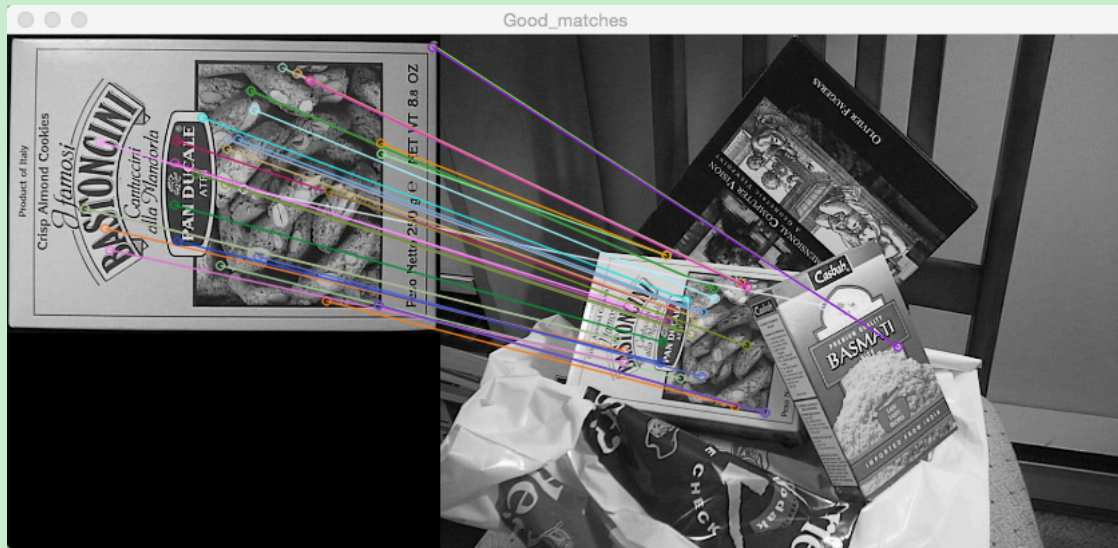

(a) (b)

Figure 3: Features2D detection.

1.4 Step 5: Match descriptors

I use "FLANN" function to match the keypoints between object image and scene image, and I use euclidean distance to calculate the similarity to find the good matches whose distance are less than 3mindistance.

(a)

Figure 4: Good match result.

1.5 Step 6: Find homography transformation

I use "findHomography" function to get a matrix of homography transformation.

Figure 5: Find homography transformation.

1.6 Step 7: Perspective transform

I use "perspectiveTransform" function and the matrix of homography transformation to perspective transform the four corners of object image to four points of scene image.
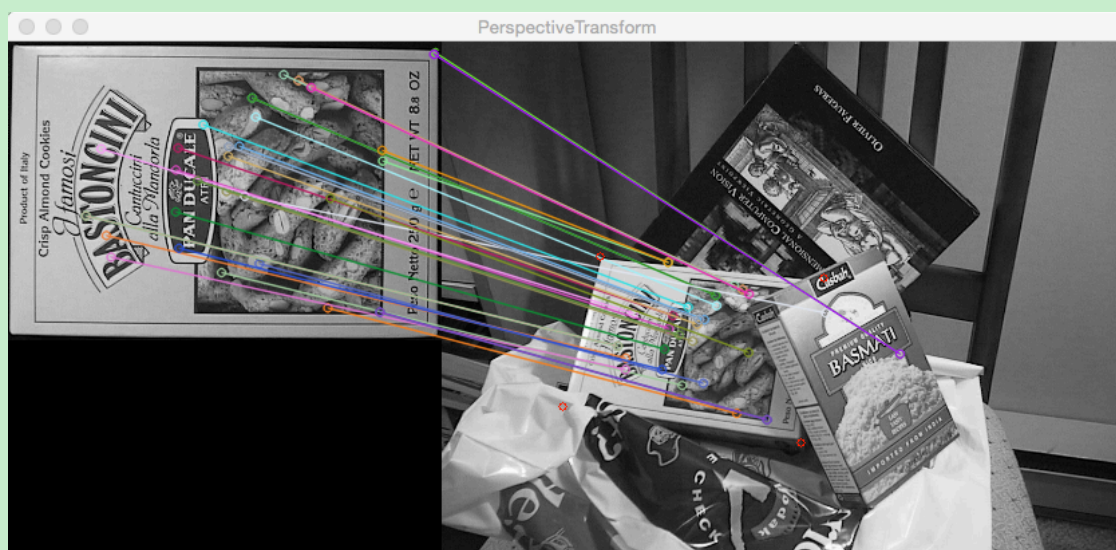
Figure 6: Perspective transform.

2. Result

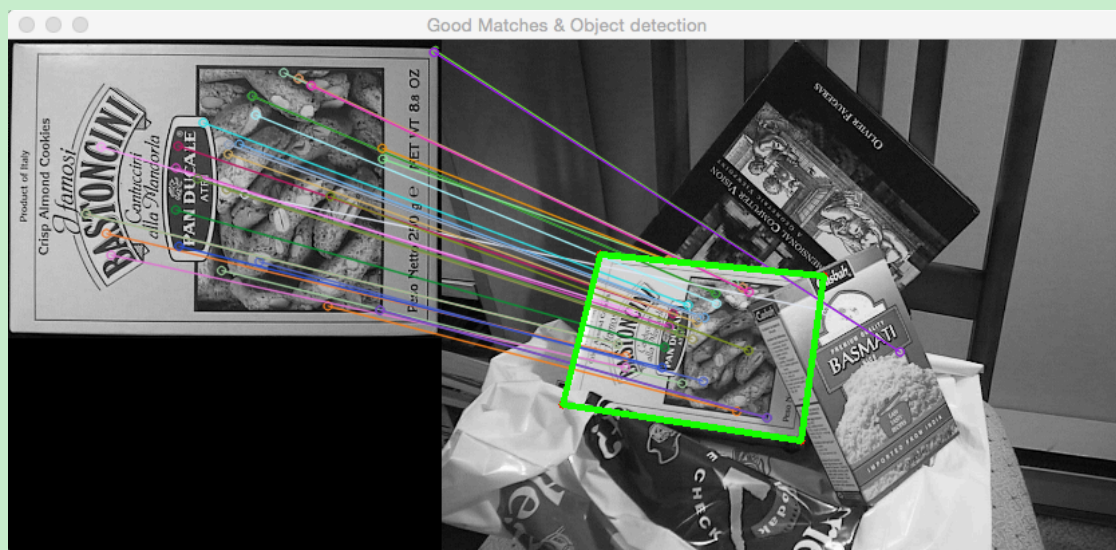## 2.1 Step 8: Localize the object

Draw lines and get the object's localization.

Figure 7: Localize the object.