

# Project 1 Writeup

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## Code Instruction

The SIFT mainly divided into two parts: Find features and match descriptors. For the project, there are too much functions according to the paper. Let me introduce them briefly.

The main function is mySIFT. It returns the 5 images of the school that labeled features many red remarks. And also returns 4 images, for every image, there lines the match features in two images.

The blobdetect returns features information lists which includes position and descriptor. The wrap function used to merge two images by giving homography matrix.

## Code details and minor function parts

DoG function is the function to generate DoG pyramid by subtracting Gaussian pyramid. Detect-features function using imregionalmax and imregionalmin function to find all the extremum in one image, which is totally convenient. Then compare it with 26 values in the neighborhood. If it is extremum, put it into the list.

Isedge function is used to decide whether it is a edge.

Accurate function is an important part that supplies the accurate position considering the sigma is not continuity. Using gradient to calculate the derivative and Hessian matrix.

Cal-oris function and ori-hist are to calculate histogram of the orientation of every features.

Smoothhist is to smooth them.

descr-hist function returns the vector of descriptor.

In the mymatch function, I use the norm distance to decide the pair of match points.

homographyget just calculate the Homography matrix by DLT method.

## An example

1. Result 1 and 2(Figure 3) is to show an example of the features.
2. Figure 3 shows the match between 1.jpg and 2.jpg.

## Result

It is sad that I do not have enough time to finish the stitch part perfectly. I hurried to finish before ddl. You could see it in the './writeup/notcompleteresult.jpg'.



Figure 1: features in 1



Figure 2: features in 3



Figure 3: match