

Assignment 2

EE 645 3D Computer Vision

(a) The gaussian scale space has been constructed using the following values of standard deviations.

	1	2	3	4	5
1	0.7071	1	1.4142	2.0000	2.8284
2	1.4142	2.0000	2.8284	4.0000	5.6569
3	2.8284	4.0000	5.6569	8.0000	11.3137
4	5.6569	8.0000	11.3137	16.0000	22.6274

Rows are octaves and columns denote the scale.

For 3_1.jpg

Gaussian Blurred Images

Octave:1 Scale:1



Octave:1 Scale:2



Octave:1 Scale:3



Octave:1 Scale:4



Octave:1 Scale:5



Octave:2 Scale:1



Octave:2 Scale:2



Octave:2 Scale:3



Octave:2 Scale:4



Octave:2 Scale:5



Octave:3 Scale:1



Octave:3 Scale:2



Octave:3 Scale:3



Octave:3 Scale:4



Octave:3 Scale:5



Octave:4 Scale:1



Octave:4 Scale:2



Octave:4 Scale:3



Octave:4 Scale:4



Octave:4 Scale:5



DoG Images

Octave:1 Scale:1



Octave:1 Scale:2



Octave:1 Scale:3



Octave:1 Scale:4



Octave:2 Scale:1



Octave:2 Scale:2



Octave:2 Scale:3



Octave:2 Scale:4



Octave:3 Scale:1



Octave:3 Scale:2



Octave:3 Scale:3



Octave:3 Scale:4



Octave:4 Scale:1



Octave:4 Scale:2



Octave:4 Scale:3



Octave:4 Scale:4



For 5_1.jpg

Gaussian Blurred Images

Octave:1 Scale:1



Octave:1 Scale:2



Octave:1 Scale:3



Octave:1 Scale:4



Octave:1 Scale:5



Octave:2 Scale:1



Octave:2 Scale:2



Octave:2 Scale:3



Octave:2 Scale:4



Octave:2 Scale:5



Octave:3 Scale:1



Octave:3 Scale:2



Octave:3 Scale:3



Octave:3 Scale:4



Octave:3 Scale:5



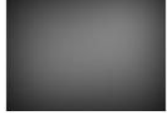
Octave:4 Scale:1



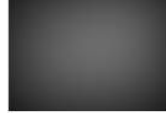
Octave:4 Scale:2



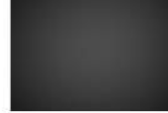
Octave:4 Scale:3



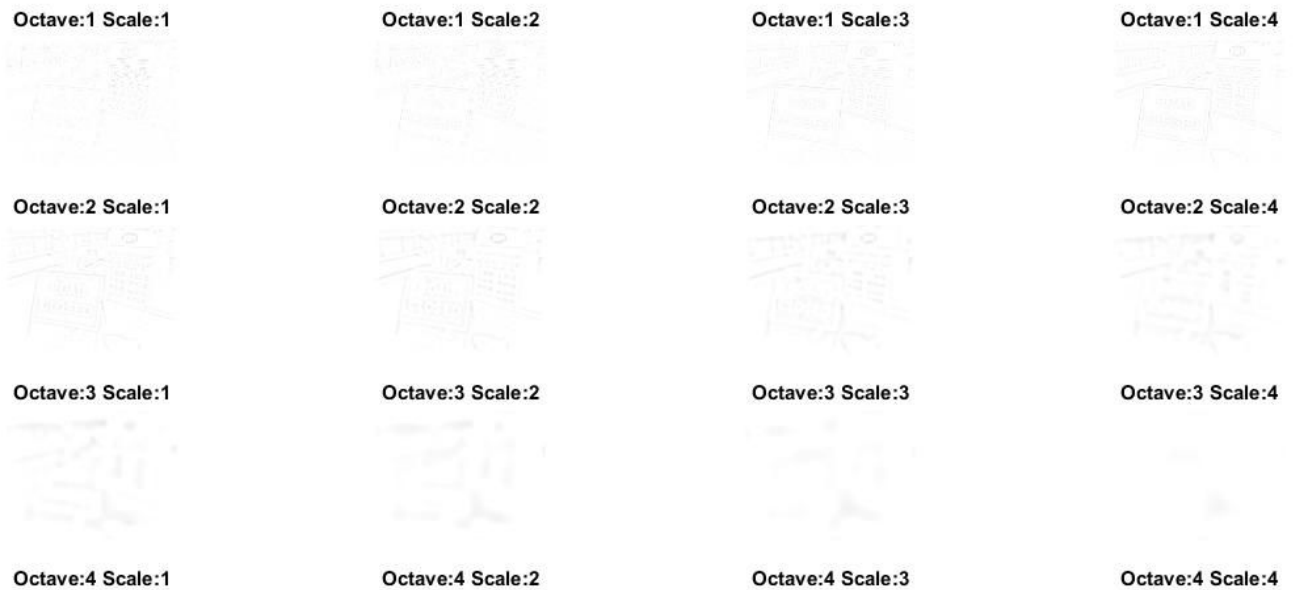
Octave:4 Scale:4



Octave:4 Scale:5



DoG Images



(b) Keypoint Detection. Different colors denote different octaves in which the keypoint was detected.

In 3_1.jpg



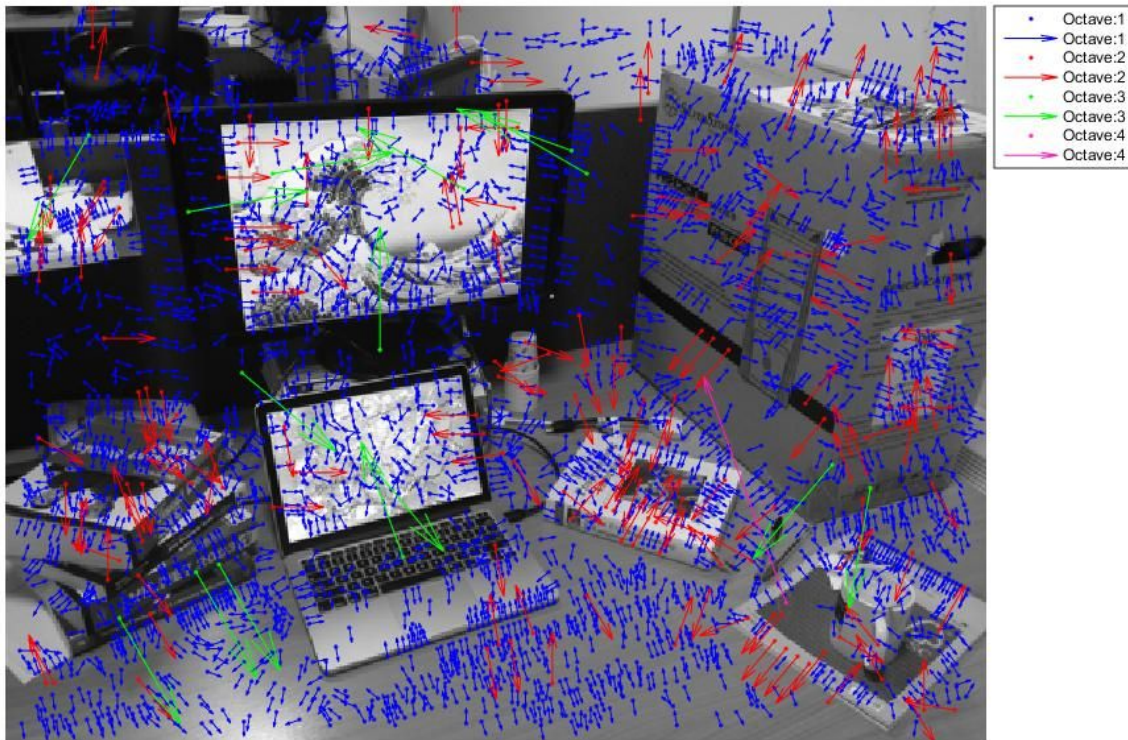
In 5_1.jpg



(c) Orientation Assignment.

Different colors denote different octaves in which the keypoint was detected. The length of vector also denotes the octave of the keypoint.

3_1.jpg



5_1.jpg

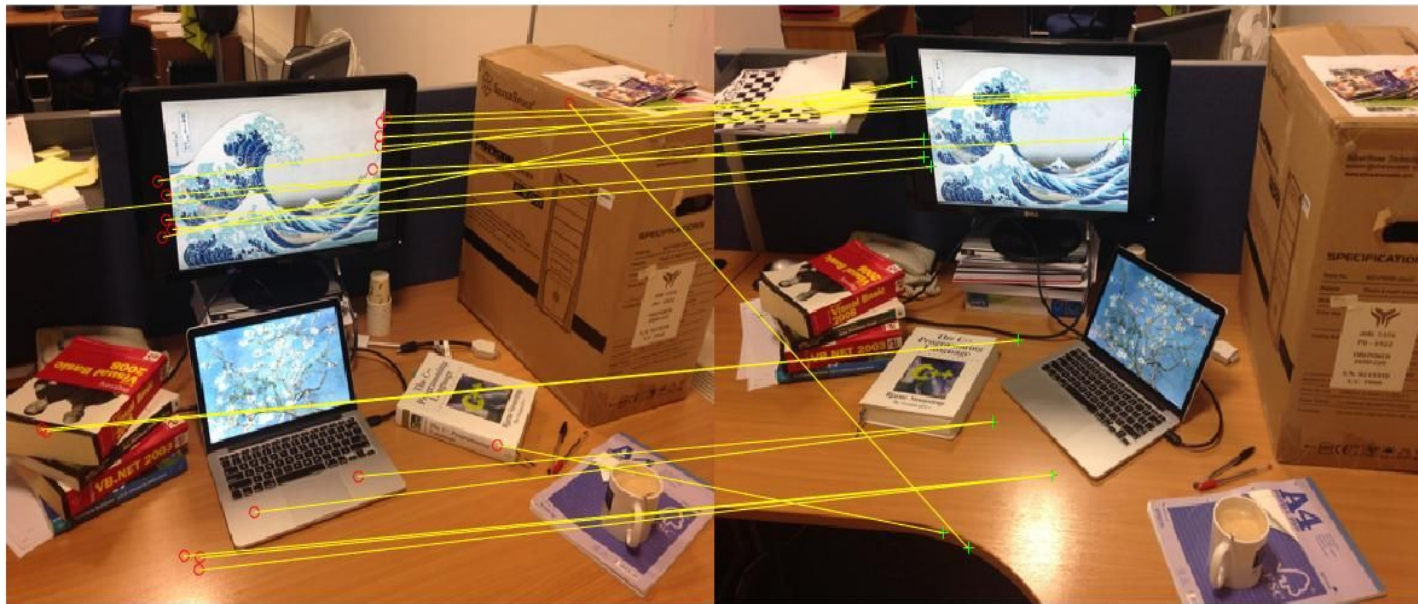


(d) Keypoint Descriptor

A total of 2793 keypoints in 3_1.jpg and 3051 keypoints in 5_1.jpg have been assigned a 128 Dimensional vector. The images were resized so that there were only 512 columns.

(e) Image matching using norm-2 distance. The matching is not quite accurate since accurate keypoint localisation and edge response elimination has not been performed.

Matching between 3_1.jpg and 3_2.jpg.



Matching between 5_1.jpg and 5_2.jpg.



Some of the manually picked keypoints



