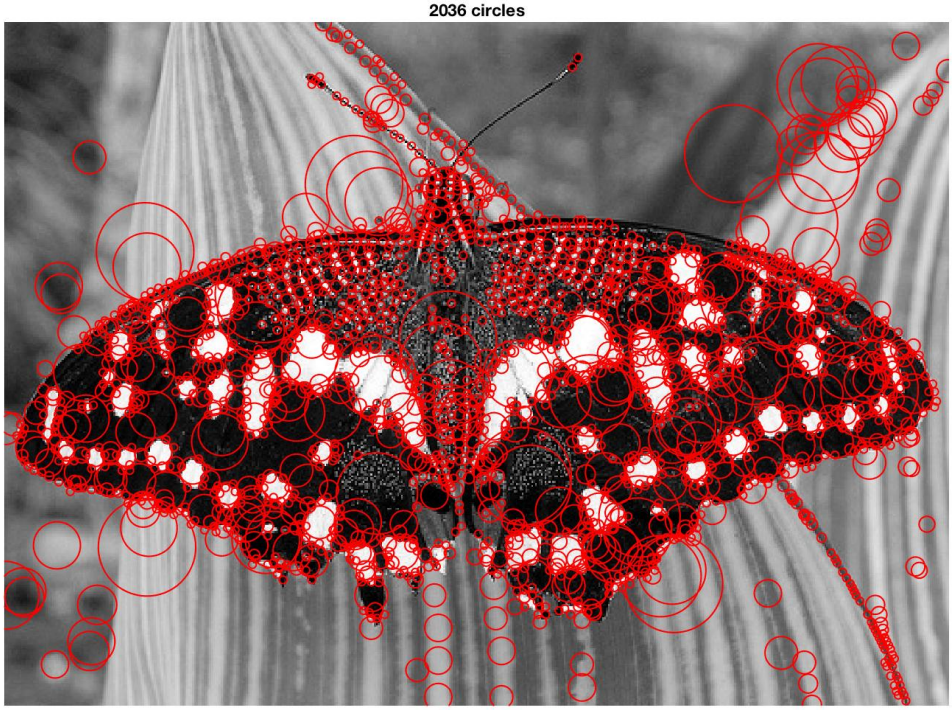
Hw 2: Scale-space blob detection

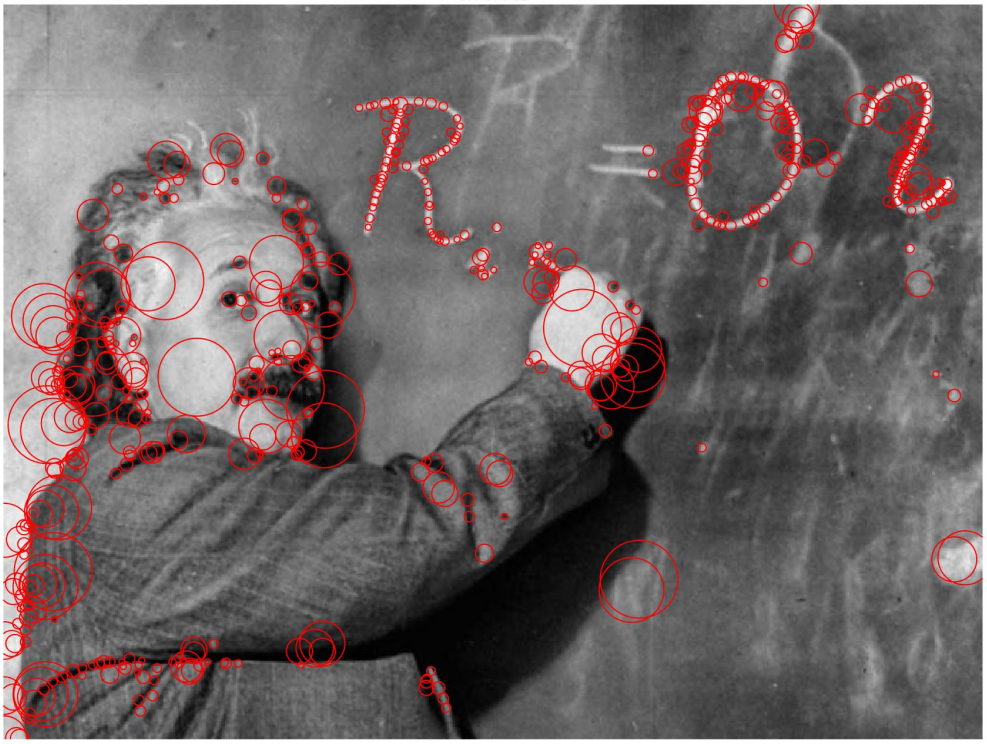
Avinash Kommineni, 50248877 October 23, 2017

Output

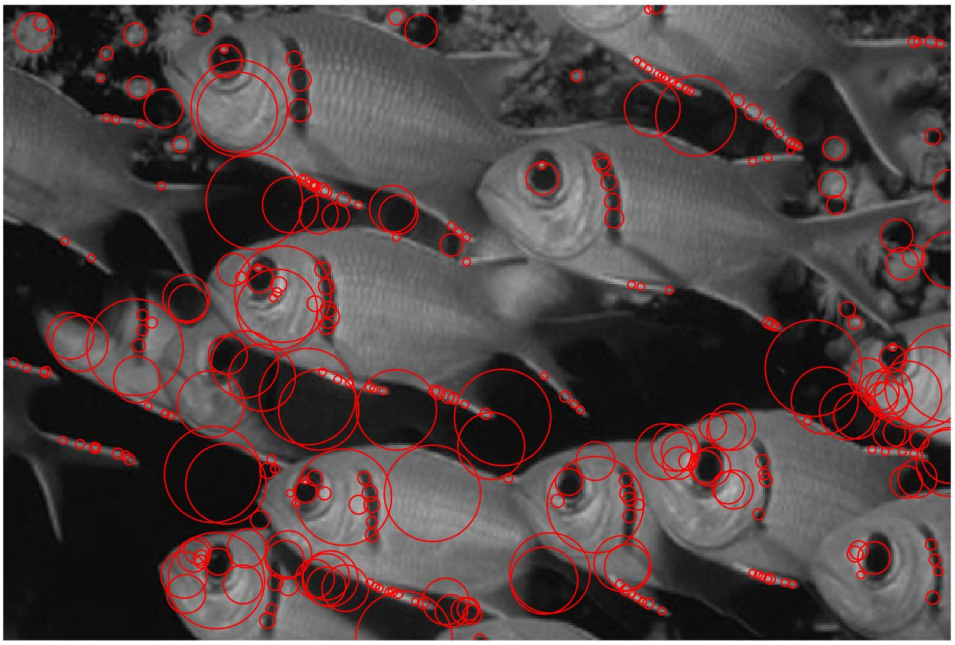
The initialisations are as follows...
Nuber of scales = 15
Sigma = 1.4
Scaling factor = 1.2
Threshold = 0.015
And the output images are as follows...



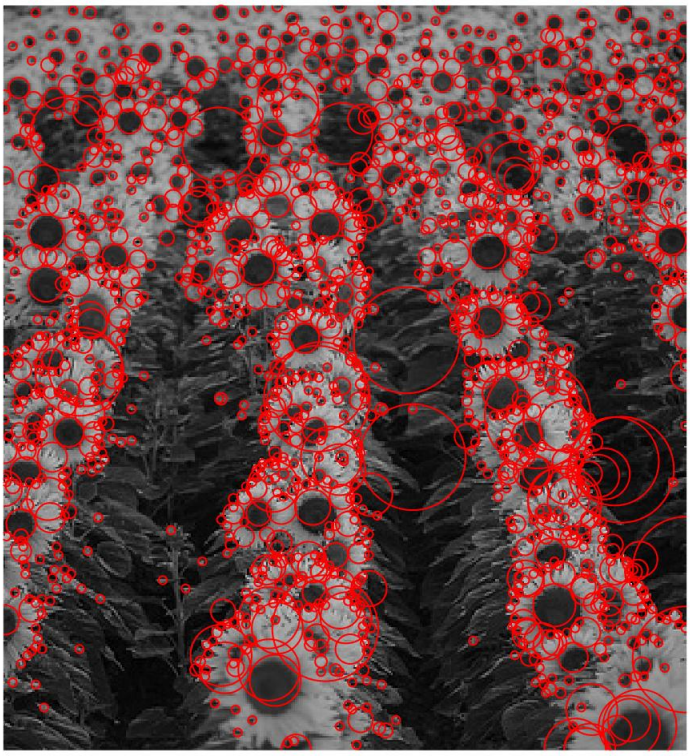
565 circles



296 circles



1506 circles

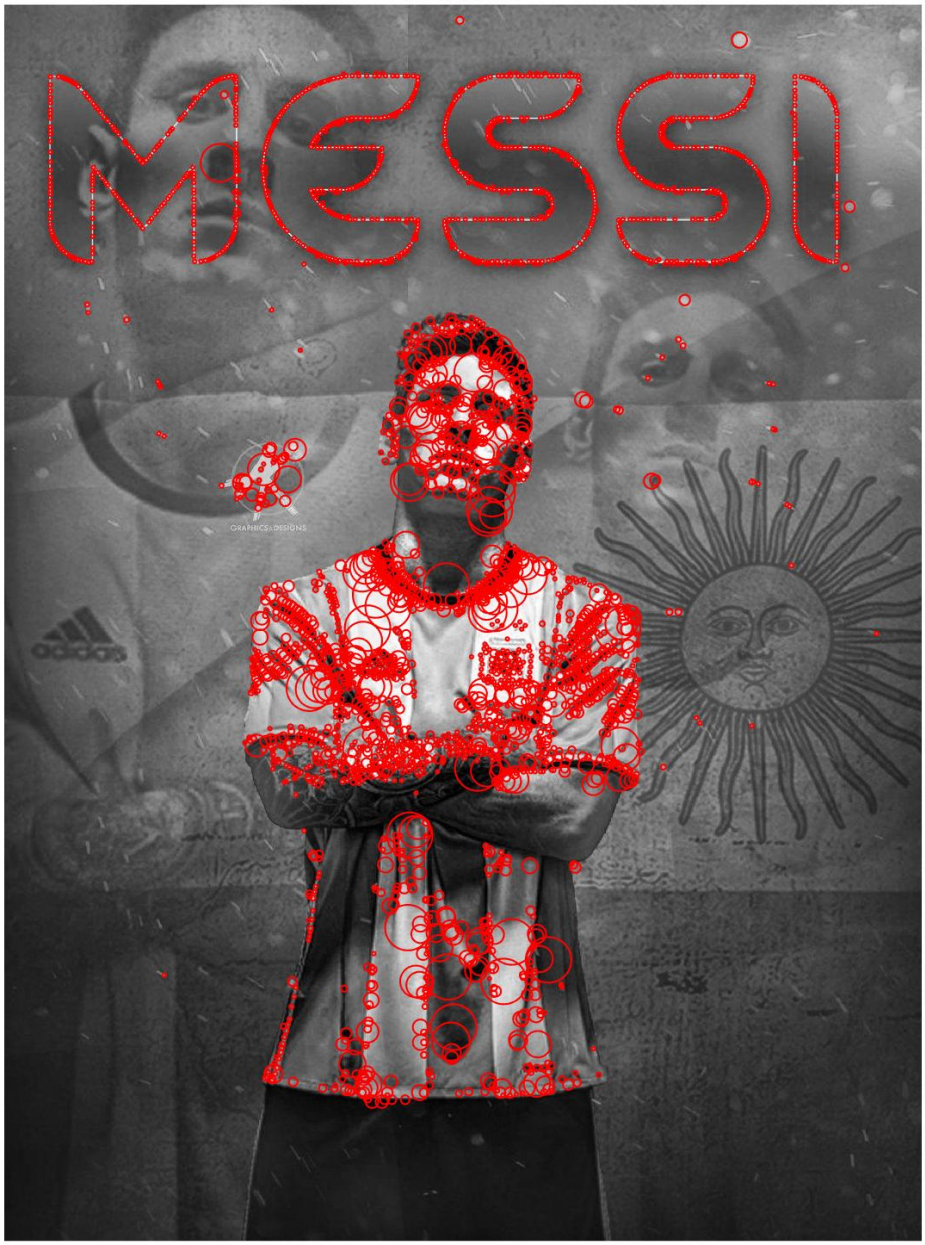


24019 circles

4873 circles

1025 circles

3316 circles



Effecient vs Inefficient

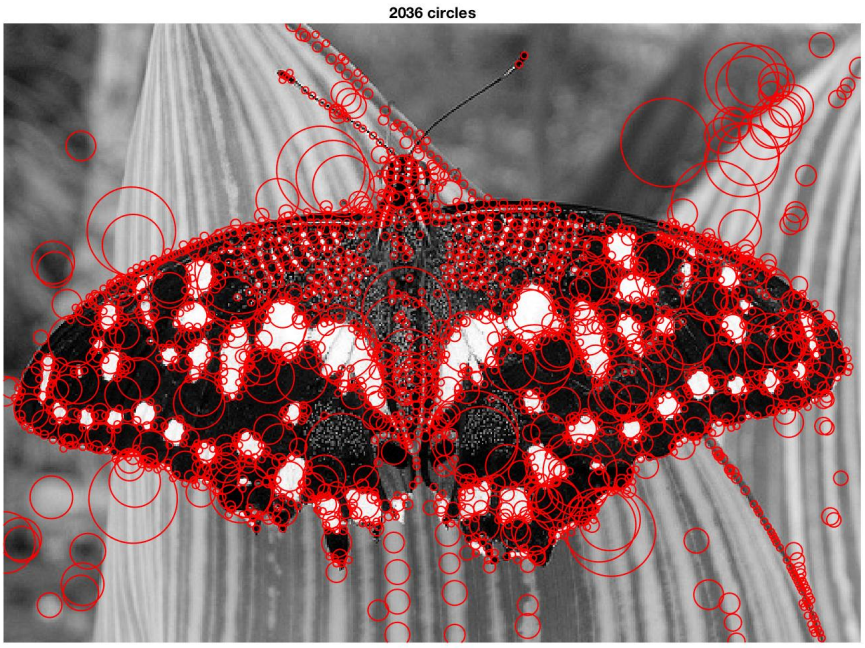
Time taken (sec)	Image Downscaling	Filter Up-scaling
Image run time for the given 4 images and custom 4 images	0.063426	0.326780
	0.122941	0.502245
	0.075058	0.312024
	0.055799	0.230015
	1.524554	12.276676
	0.471535	3.284120
	0.180295	1.275178
	0.327218	2.362955

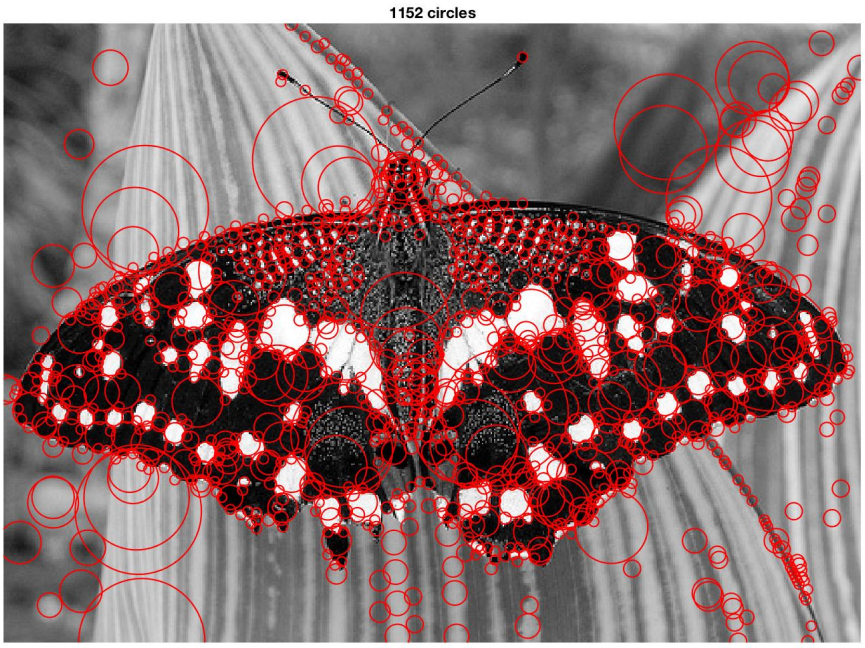
Notes

- The time increases rapidly for the case of filter up-scaling and especially for the for those custom images which are bigger in size.
- The time increases for the case of sigma(σ)=2.0. It increases significantly for the filter up-scaling and marginally for the other one.

Time taken (sec)	Image Downscaling	Filter Up-scaling
Image run time for the given 4 images and custom 4 images	0.065452	0.759418
	0.096532	0.925315
	0.062356	0.580354
	0.075324	0.431651
	1.474615	23.838904
	0.446366	5.750504
	0.172011	2.333773
	0.328813	3.933201

- The same image with sigma as 1.4 and 2.0





Not much differences between two except that the first image has got granular part covered because it's sigma is low.

- Thick and sharp edges like the text in 5^{th} image is picked up every layer of the filter so the thick resultant circles.
- The images produced with filter up-scaling are found in the folder FilterScaled.
- While implementing the 3D nonmaximum suppression, the border condition was handled by replicating the first and layer of scale space layers.
- Deponding upon the value of sigma, the value of threshold must also be adjusted so that the image is not too over or scarcely populated with circles.