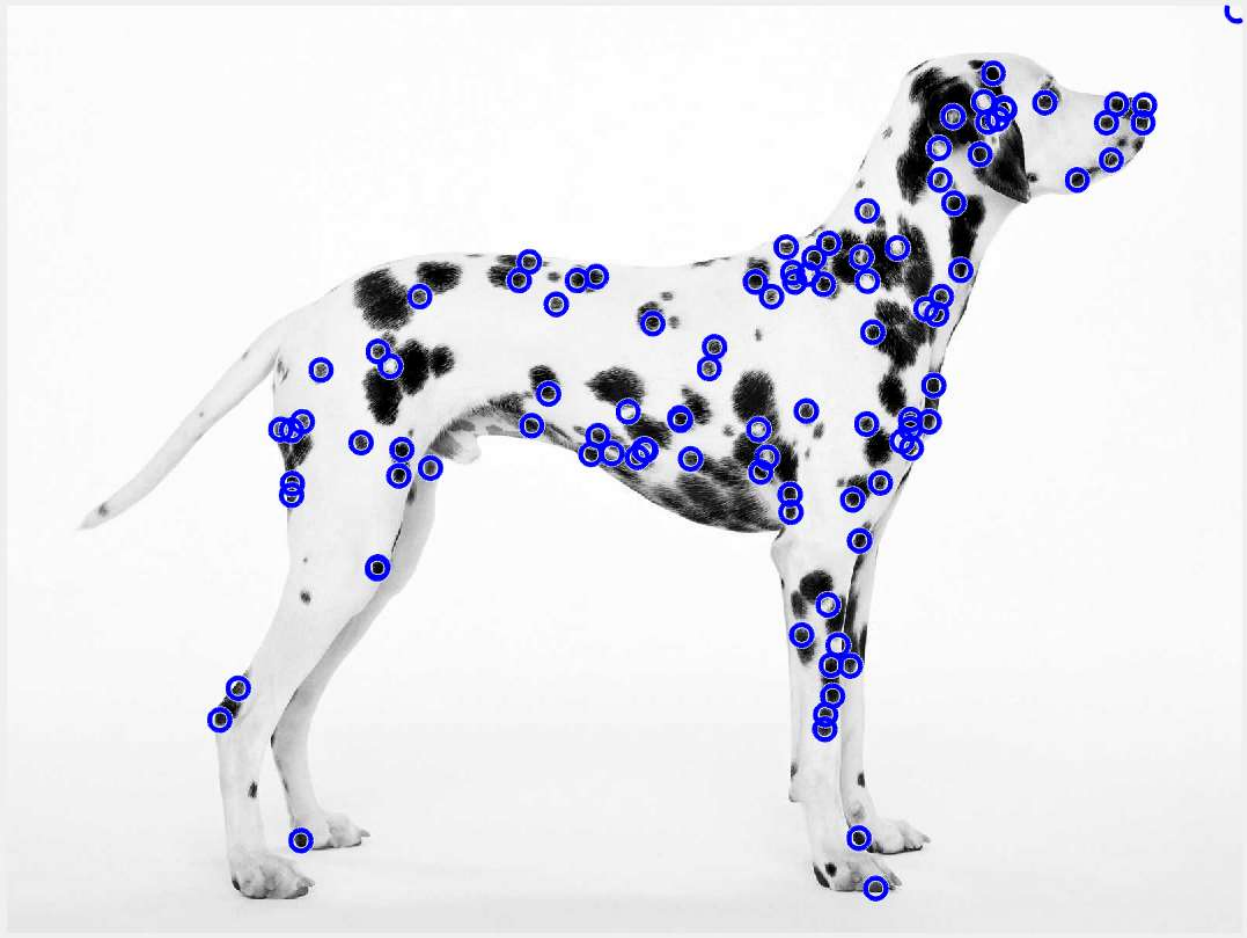
Homework 4 Writeup

Original Image:

Image with overlay of detected blobs:



Parameters used/tinkered

Threshold – I set the threshold to two values 20-35% of the maximum value found throughout all of maxScaleSpace. Its quite intuitive that the lower the threshold the more blob candidates there would be. I noticed when I first adjusting my parameters there was a sharp tipping point at 20% of the maxmum value which blob candiates apeared exponentially. However most of those blobs were false as they were on the edges.

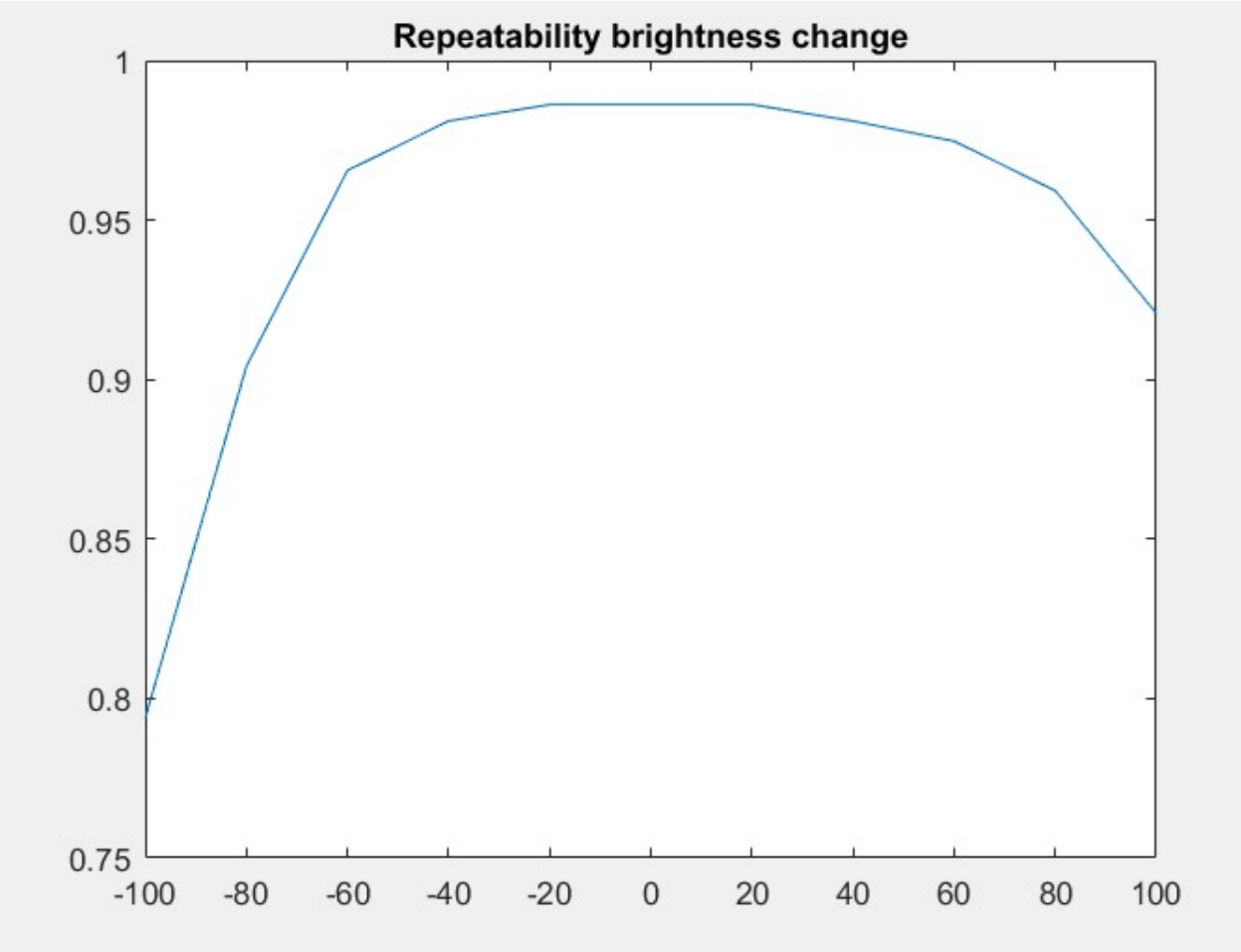
Number of Scales – I ended up settling with 10 being the number of scales I used for this assignment, I noticed a trend when I kept other parameters constant the number of points that passed the threshold decreased significantly when the number of scales increased.

The intital value of sigma – caused an decrease in the amount of blobs detected when all other parameters were kept constant. The runtime for the program to excute also seemed much longer but this could do to my hardware issue. When I decreased the intial sigma the number of blobs detected seemed better with less false blobs given the same threshold. However going to intital sigmas below 1 did not produce better results and seemed to harm the outcome so I settled from decreasing sigma from 2 to 1.

Overall parameters selected was 35% threshold, 10 Scales and a intial value of 1 for sigma.

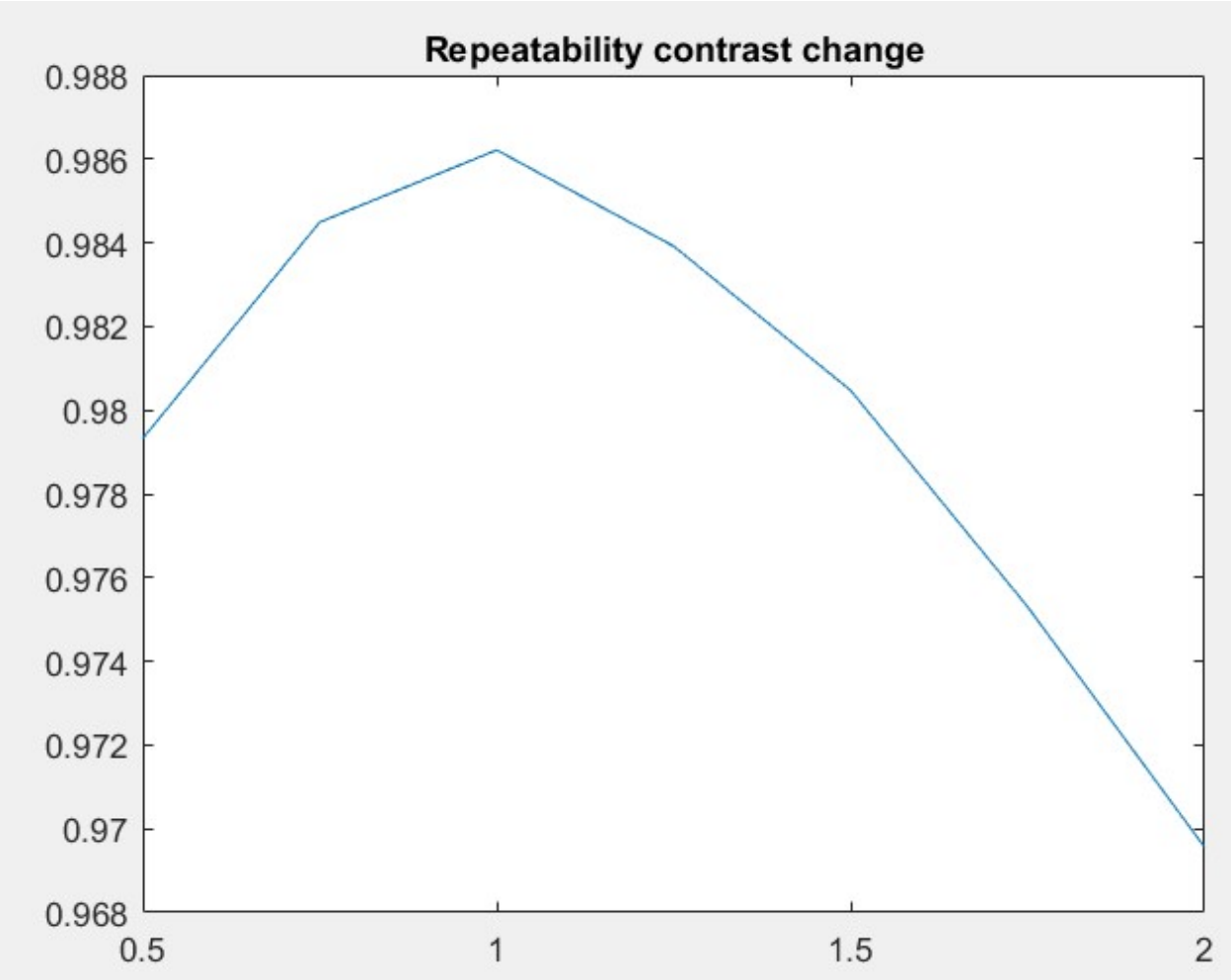
Extracting Key points and Descriptors

Robustness to Brightness Change



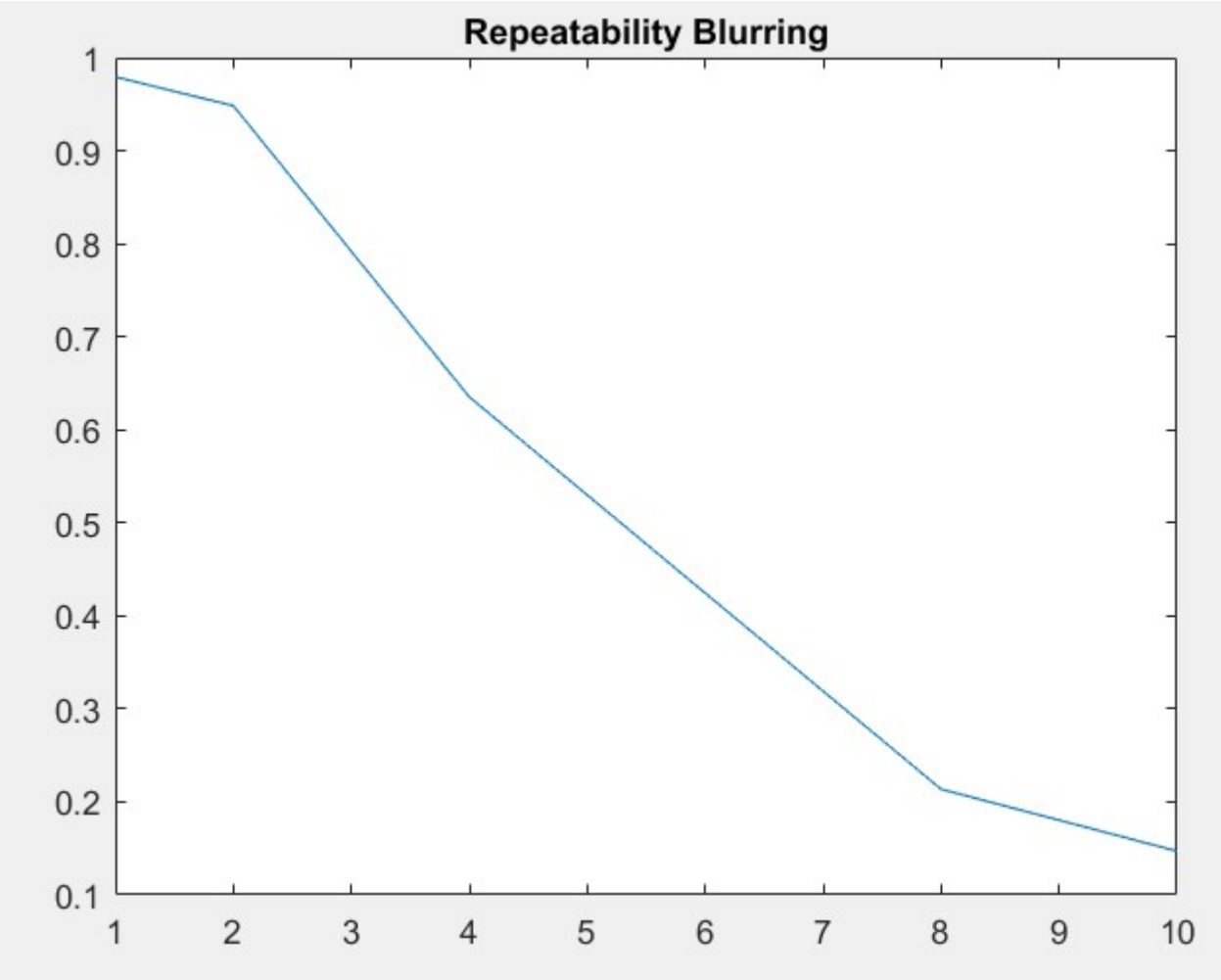
The SIFT descriptor shows some slight error in repeatability even when there was no change being added as can be seen when delta was 0 meaning there was no change on the original image however this error is slimy it is less then 5% difference and even the largest error seen at a negative shift of 100 gray scales the difference is still sitting around 80%.

Robustness to contrast change:



The SIFT descriptor seems to handle contrast change a lot better then brightness change with error at no change being at 98.6% match when Y = 1. Overall the lowest match percentage sits at slightly below 97% when y = 2.

Robustness to Blurring



The SIFT descriptor does horribly with blurry images, there is a steep decent down to less then 20% match when sigma is 10. This is most likely due to the feature points being distorted and shifted uniformly. While the feature points in contrast and brightness still remain mostly unchanged in position only intensity.