CSE 573
Fall 2016

Home work 4 - Report

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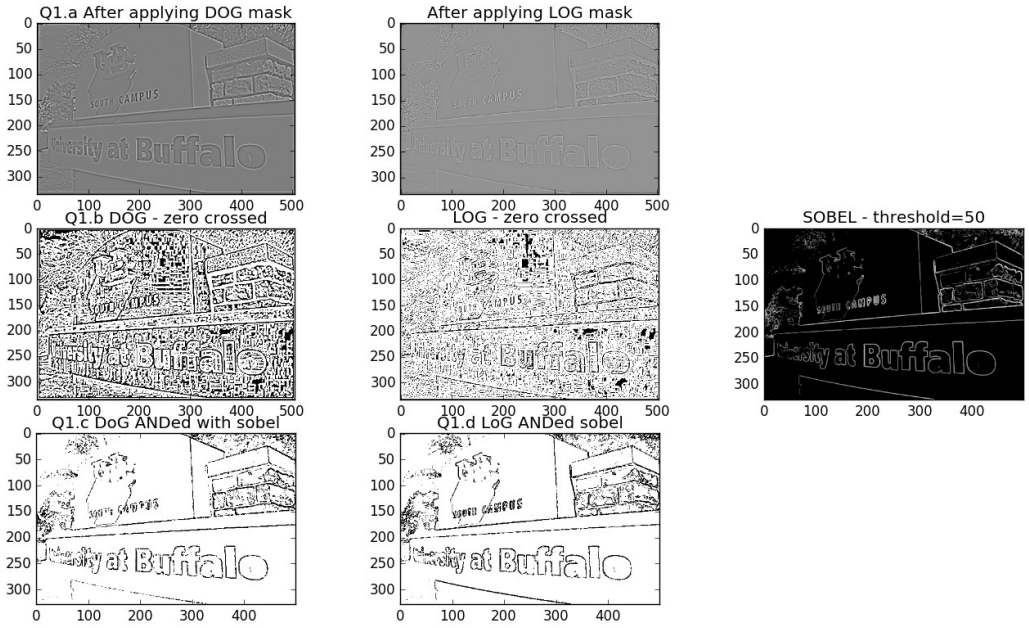
Problem (1) Edge Detection by Zero crossing, DoG and LoG

a. DoG mask was applied to the image. This was done using *signal.convolve2d* of *scipy.*
b. Zero crossing was done by comparing the current element with its 4 neighbours. If there was any change in the 'sign', it was identified as a zero crossing.
c. dx and dy of sobel on the image were calculated. The results were merged i.e. the magnitude was found out using *hypot* of numpy. Threshold was applied on the magnitude. Weak edges were removed using this.
d. LoG mask was applied, zero crossing was done. Weak edges were removed using the magnitude of sobel.
e. Same images can be obtained by configuring which bands to pass and which to filter.
Result pictures are included below.

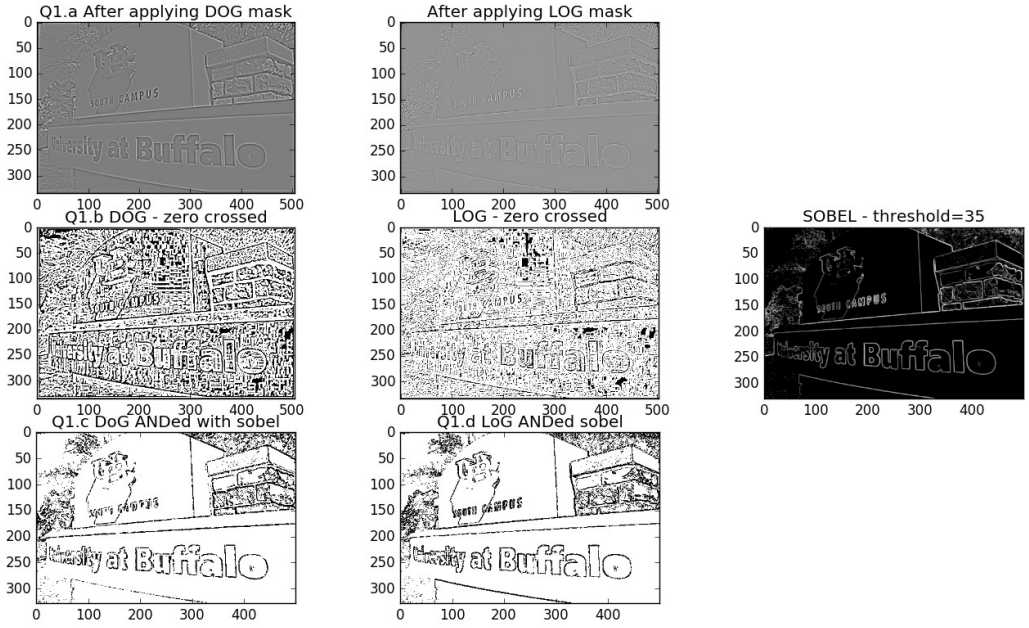
Problem (2) Image segmentation

a. Super grid data structure was obtained by finding difference between each pair of rows and each pair of columns and the result was inserted between them.
b. A threshold was set and all crack edge elements that were less than the threshold were set to 0.

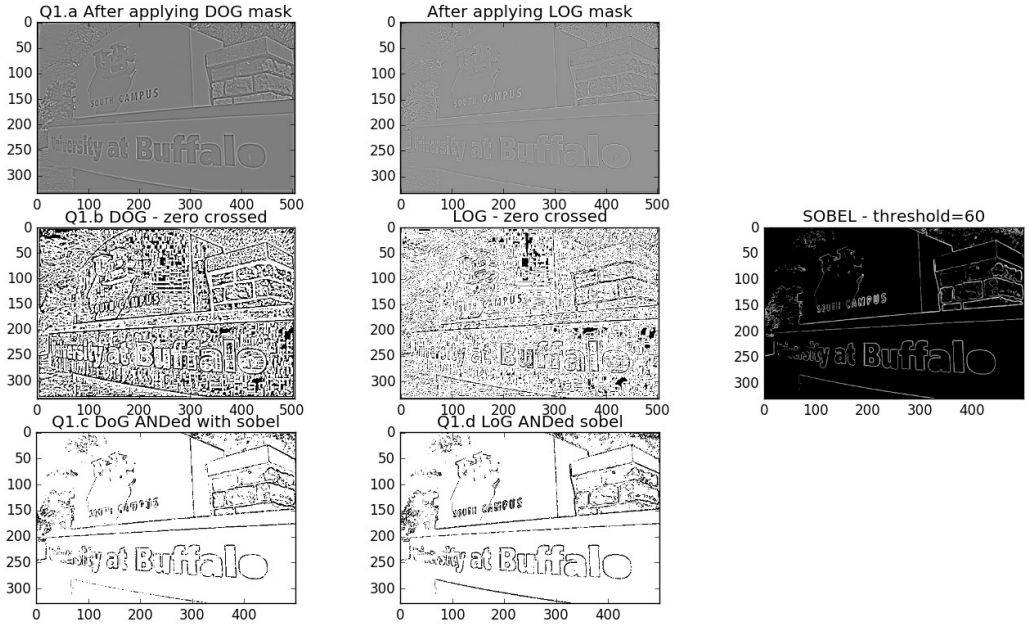
Edge detection with threshold = 50:



Edge detection with threshold = 35:



Edge detection with threshold = 60:



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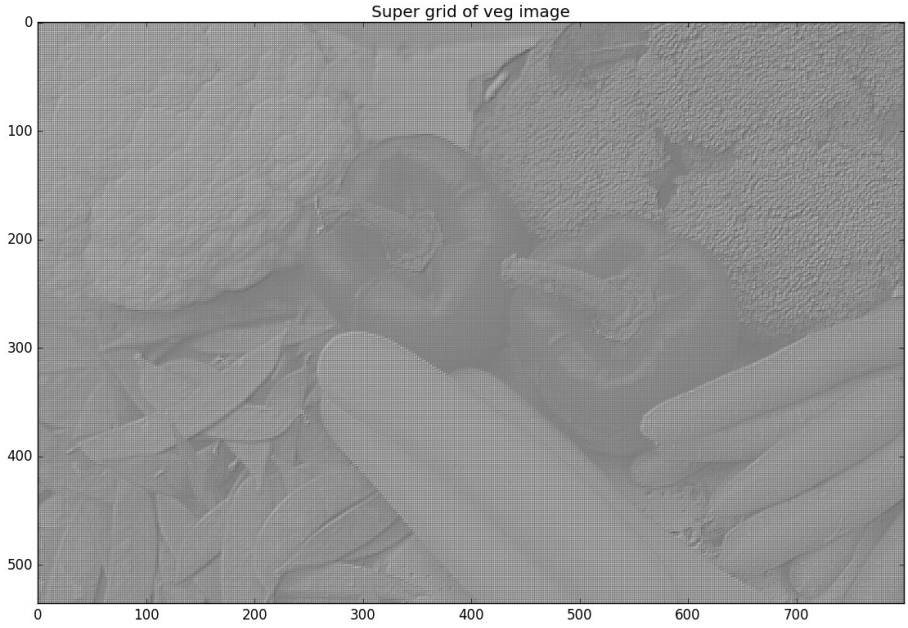
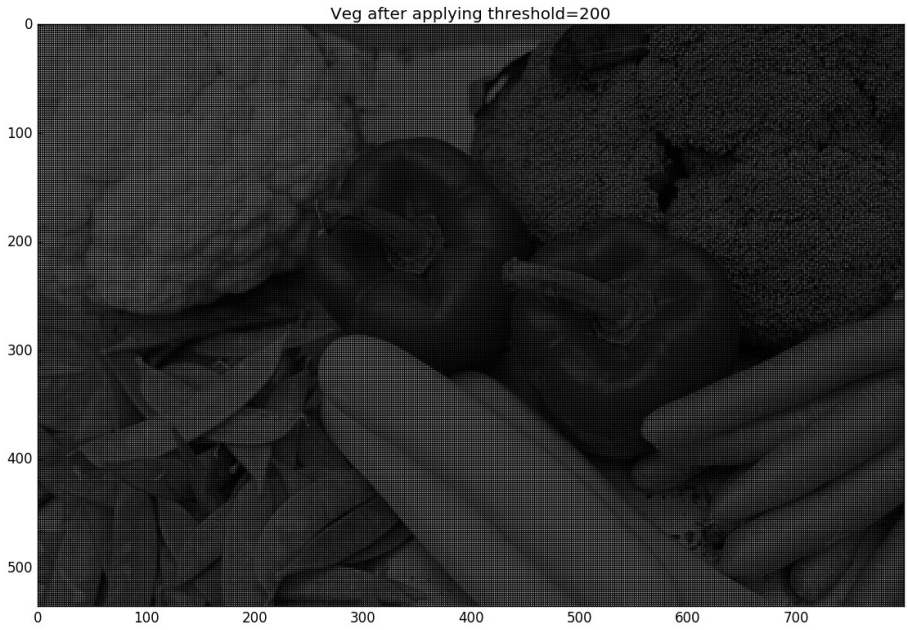
Super grid representation of vegetable:



Vegetable picture after threshold was applied on crack edges:



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