ECE 4310/6310 Introduction to Computer Vision
Semester Project – Segmenting Foods
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In this project we implemented a GUI app to segment images of different foods provided to us in the class. This project was implemented by keeping Lab 8 code as the base. The code we implemented in the lab 8 was modified and the implemented to develop a GUI app to segment foods.

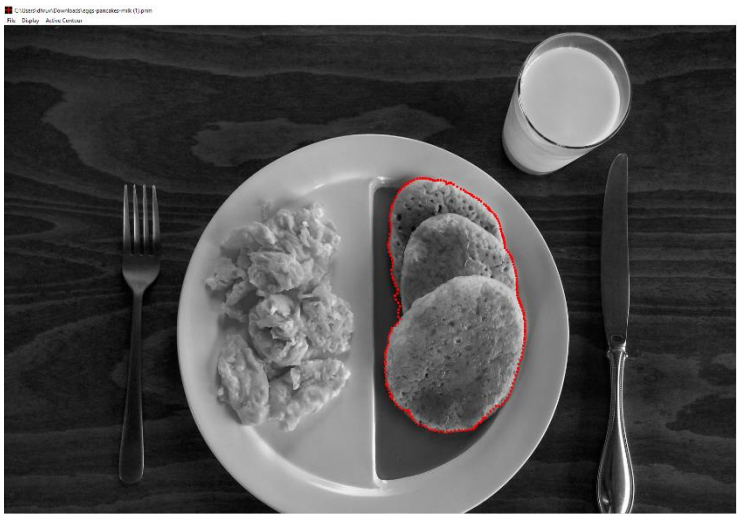
Discussion:

In **Rubber band** active contour model two internal and 1 external energy was used. The internal energy terms are the square of the distances between points(internal energy 1), and the square of the deviation from the average distance between points(internal energy 2). And the The external energy term is the square of the image gradient magnitude, and is calculated using convolution with a Sobel template. For Rubber Band active contour Model, the window around each contour point is 7x7 pixels. Each energy term is normalized by rescaling from min-max value to 0-1. The active contour algorithm run for 30 iterations. The energy term was not equally weighted.

For **Balloon model** an internal energy term is needed that weights point according to distance from centroid of contour. Around each contour point a window of pixels is considered. Distance of each pixel around the contour from centroid was taken as an internal energy term. As in balloon model we need to expand instead of shrink, negative of distance is taken for energy minimizing criterion. By Testing, it has been observed that a bigger window works well for balloon model as bigger window increase the weight of external energy and edge properties. the window around each contour point is 11x11 pixels for this experiment.

Results:

Initial Contour Points vs Final Contour Points (Rubber band model):



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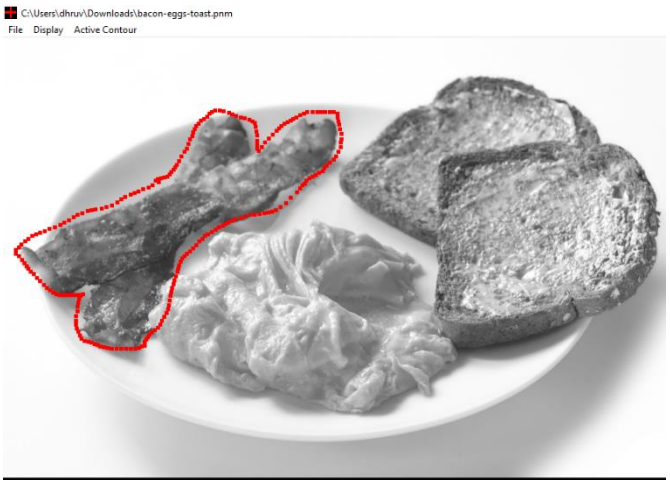

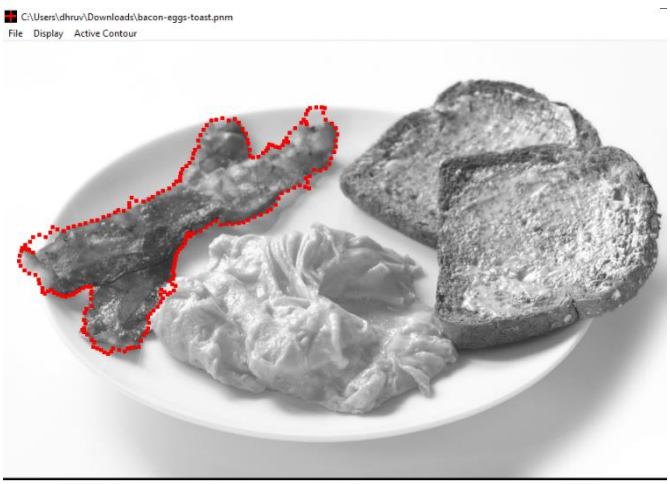

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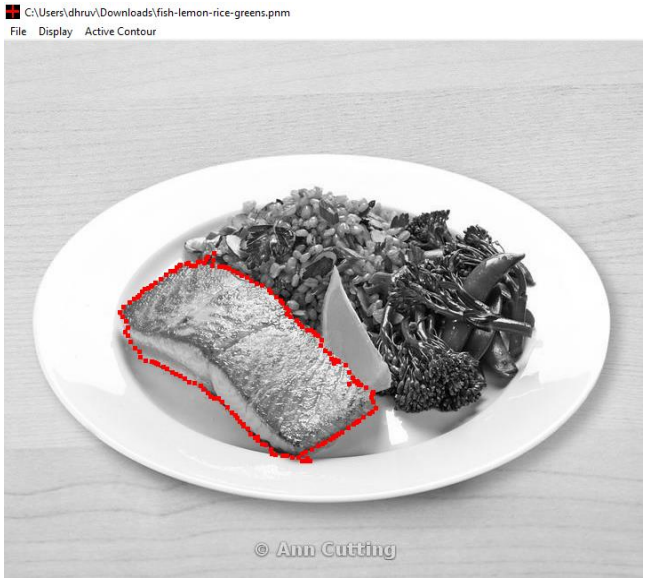
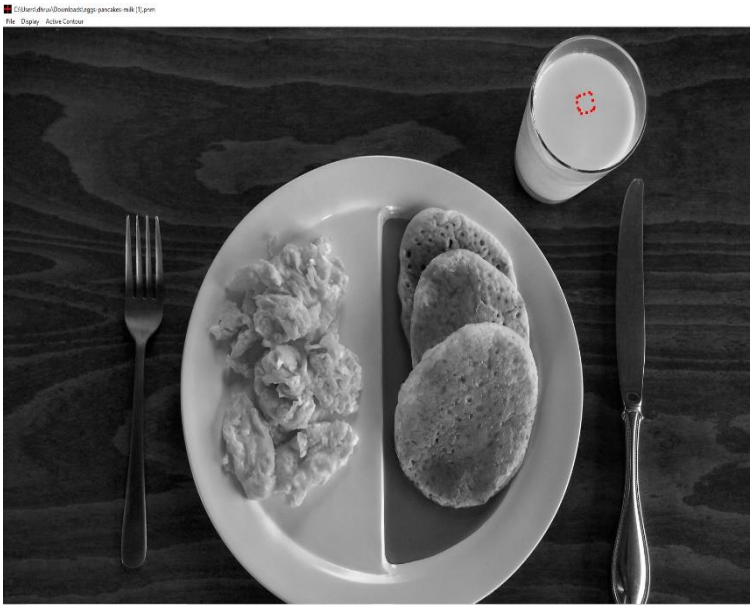
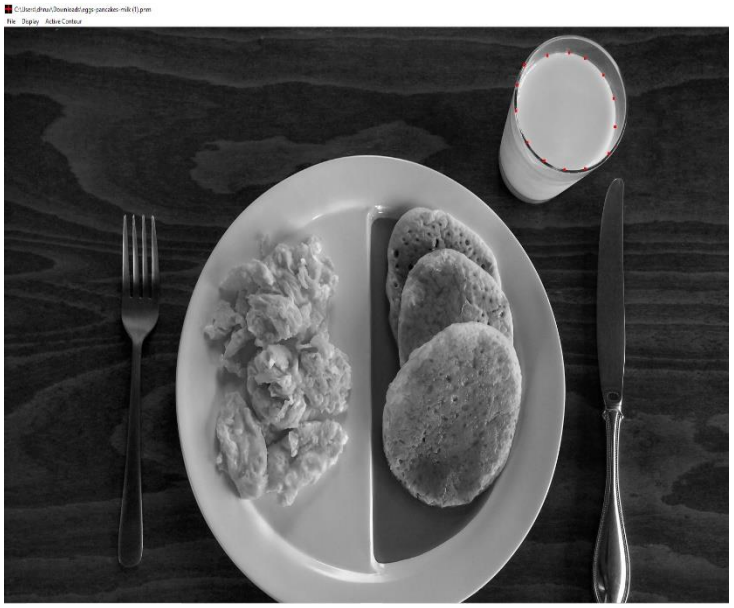


Initial Contour Points vs Final Contour Points (Rubber band model):

Initial Contour Points vs Final Contour Points (Balloon model):





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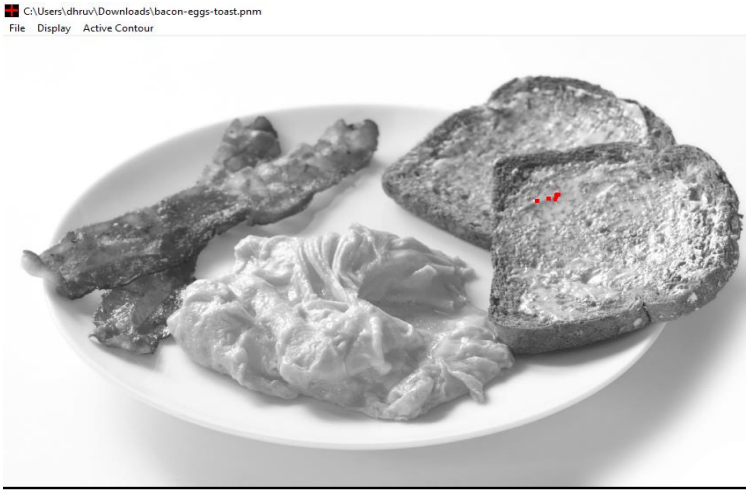

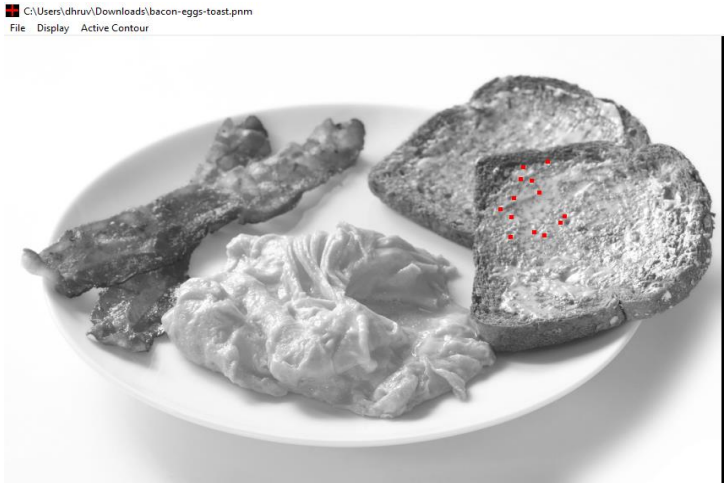

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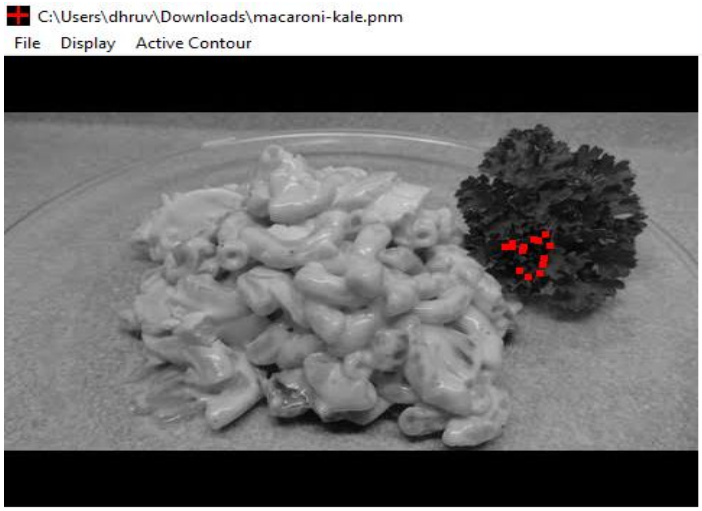

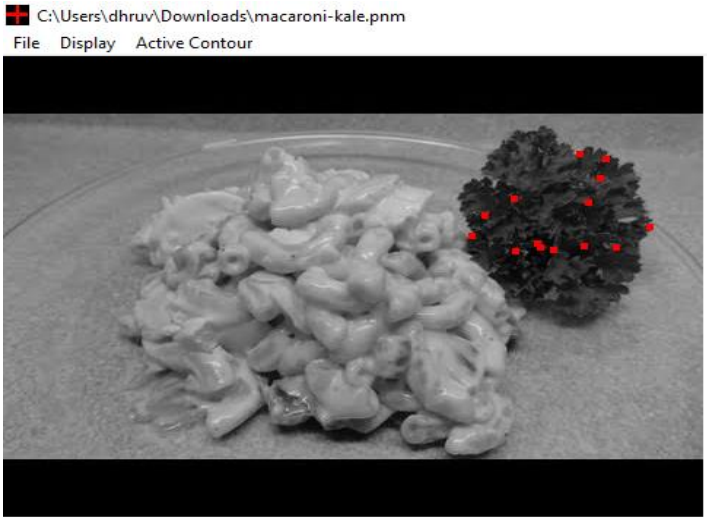

Conclusion:

Hence the above pasted images are the results we got post implementation of the project. The problem with the balloon model is that it is unable to differentiate between internal and external energy terms in the cases where there are ample terms present. Using the proper weights for internal and external energy term this project can be implemented in more proper manner.