Assignment 4

Deadline: 11:55 PM, 28th March 2019

1 General Instructions

- The assignment can be implemented in MATLAB, Python or C++.
- The code must be robust and scalable and it should work for images of any size.
- The submission must have a directory called *code/* which contains all the code use to generate the results. The report and the output images should be in the *report/* directory.
- Please ensure that the report contains your roll number. Zip the assignment folder. The zip file should be named **Roll Number_assignment4.zip**.
- Make sure that the work you submit in this assignment is your own. DO NOT COPY ANY PART FROM ANY SOURCE including your friends, seniors or the internet. Any breach of this rule could result in serious actions including an F grade in the course.
- Please post your doubts on the Moodle forum instead of asking the TA's personally.

2 GrabCut

Implement the *GrabCut* algorithm taught in class for binary image segmentation. You may use the in-built optimizers for Min-Cut/GMMs but the graph formulation and the iterative process must be implemented by you.

We would be providing you with the test images and bounding boxes. Each image contains only one foreground object and has a corresponding bounding box, which is a rectangle around that object. Please find the images and bounding boxes here.

The final program must have a GUI component that allows the user to draw the bounding box which specifies the foreground object in an image and the program should generate the segmentation accordingly.

You report must include a study of how changes in the various parameters affects the segmentation. Some parameters you could experiment with:

- The number of iterations
- The number of components in the mixture model
- The Color space
- 4 Neighbourhood vs 8 Neighbourhood

3 Stereo correspondence using MRFs [OPTIONAL]

Use the Markov Random Fields framework to generate the stereo matching for the pairs of images given in Assignment 3.

The report must include a comparison between this method and the methods you used in Assignment 3, with a qualitative explanation for your observation.

Please include the code used in a new sub-directory *mrf/* in the *code/* directory. The report for this may be included in the previous question's report.

Bonus marks will be given based on the code and quality of results.