Image Processing

Course work 1

(deadline: August, 29)

Part 1

1.1 Download the Girl Face image and plot a histogram of the grey levels it contains. (Try plotting a histogram of another grey scale image and comparing the difference) (5 points)

1.2 Write a short program to threshold the image and try to identify a good threshold by trial and error. Create a ground truth segmentation. (15 points)

1.3 Use your ground truth segmentation to plot an ROC curve for your thresholding algorithm. What threshold does the ROC curve suggest? You may have to implement an algorithm to find the point closest to a desired Operating Point. How does it compare to your trial and error estimate? (30 points)

Part 2

2.1 Implement a region growing algorithm and compare its performance at segmenting the face in the image above with the performance of the thresholding algorithm. Show the seeds you chose. (25 points)

2.2 Implement the mean-shift algorithm and show the results that you achieve for different values of the "radius" parameter. (25 points)

Deliverable 1:

Write a **detailed report** on your process, thoughts, findings and outcomes. (80%)

Deliverable 2:

Include your code and any additional file (images) needed to recreate your work. (20%)