

CAP 4401 - IMAGE PROCESSING

Assignment 2

The purpose of this homework is to experiment with histogram modification and color processing

Your program should be able to do the following:

1. Histogram modification [5 points]

- Add histogram stretching for grey level images to your choice of options
- Stretching is defined by user provided range parameters: $[0,a] \rightarrow [0]$, $[a,b] \rightarrow [c,d]$, $[b,255] \rightarrow [255]$
- Your program should
 - apply the procedure within ROI (up to three non-overlapping ROI)
 - generate display of the histograms for the ROI before and after the procedure, this is good for debugging and illustrations
- Test your program on some grey level images

2. Color processing [5 points]

- Apply histogram stretching to R,G,B components independently and to all three, experiment and discuss results
- Add color conversion capability to your program (RGB \leftrightarrow HSI)
- Add color histogram stretching by applying it to the I component, then convert back to RGB for display
- Compare utilization of RGB vs HSI for color histogram processing.
- [extra credit - 2 point] Perform histogram stretching on both I and S components. How about including all three I, S and H components? Experiment.

Make sure that you have complete report for this assignment (not just few comments).

- Include input and output images (use several gray level and several color images as appropriate).
- Discuss performance of histogram processing on grey level images.
- Discuss performance of your implementation on color images. Discuss performance in RGB and HSI domains. Support your conclusions by examples. Discuss extra credit portion as appropriate.

How to submit

- Submit paper report in class on the due date
- See TA help desk for instruction on program submission and testing.