

Concordia University
Department of Computer Science
& Software Engineering

COMP 478/6771 Image Processing
Project
Due date: December 15, 2017

Instructions:

This take home project has two parts. It is strictly forbidden to copy from each other. A zero mark will be given to submissions with either identical writing and explanations or identical programming codes. A written report must be submitted in hard copy. The programming codes can be submitted via the EAS system.

*Undergraduate students can team up with another student as a group of **TWO**. Students **MUST** submit a report (**MAXIMUM** 10 pages) and Matlab codes.*

Part I.

Read the paper entitled “**Ternary Entropy-based Binarization of Degraded Document Images Using Morphological Operators**”. The paper is provided on the course webpage. Do the following after reading:

1. Summarize the **main ideas** of the paper including
 - a. The *motivations, contributions* of the paper.
 - b. *A flowchart* that shows all the main steps of the proposed system.
 - c. For each step, provide *a short explanation* such as its purpose, input, output, etc.
2. Summarize *the pre-processing* (Contrast Estimation) and *post-processing steps* mentioned in Q 1.c (above) *in the form similar to Algorithm 1 and 2*.
3. Implement *the double threshold binarization method* described in section III.2 of the paper. Evaluate the method using the images provided on the course webpage or your own images. Report the results and your comments.
4. Similar to Q 3, implement *the pre-processing step* (section III.1) and report your results with comments.
5. Similar to Q 3, implement *the post-processing step* (section III.3) and report your results with comments. Note: further details of this step are also provided on the course webpage.

Part II.

Choose an image of your own liking either from the internet or elsewhere that requires some form of histogram correction. You must not use the same image as the one chosen by another person in the class. A good choice is an image that has large contrast of brightness such as dark indoor versus sunny outdoor contrast. **Undergraduate students can use gray level images. Graduate students must use color images.**

1. Apply histogram equalization to the image and show the new image after histogram equalization. Give comments on your results.
2. Use your own judgment to design a target histogram for the original image. Apply histogram matching to the original image and show your result. Comment on your results and compare the two images obtained by two different histogram correction methods. *An example is posted on the course webpage.*

The absolute deadline to submit your project is December 15, 2017 at 5:00PM