Department of Computer Science and Engineering

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CS4043 IMAGE PROCESSING
ASSIGNMENT PART I

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The following algorithm is for finding a threshold T for global thresholding:

1. Read an image, follow the steps
2. Select an initial estimate for T(select T to be the mean gray value of the image to be segmented). Segment image using following equation.

$$G(i,j) = \begin{cases} 255 & \text{if I(i, j)} > \text{T} \\ 0 & \text{if I(i, j)} \leq \text{T} \end{cases}$$

3. Segmentation of image using T will produce two groups of pixels: G_1 consists of all pixels with gray level values > T and G_2 consisting of pixels with values ≤T.
4. Compute the average gray level values A_1 for the pixels in regions G_1 and A_2 for the pixels in regions G_2.
5. Compute a new threshold value T=0.5 (A_1+A_2)
6. Repeat steps (b) through (d) until the difference between values of T in successive iterations is smaller than a predefined parameter T_0. (In this exercise, T_0=1).
7. Perform segmentation to the image using the obtained threshold value and plot the resulting black-and-white image (Image1).
8. As you can see, the resulting image contains unwanted noise (If not present add noise to the resulting image).
9. Remove the noise from the noisy image (Use any method).
10. Plot the resulting image from which noise has been removed (Image 2).

Output Required

- Create ASSIGNMENT_PARTI.tar file containing code.
  $ASSG\_PARTI < number > \_ < rollnumber > \_ < firstname > . < extension >$
- Algorithm in a Text file.
- Compare resulting image with ordinary thresholding and Comment your observations (Documentation required).
- **Reference:Chapter 10, Section 10.3, Digital Image Processing, Gonzalez**