Indian Institute of Technology Tirupati

Image Processing Lab

Lab sheet - 02

Date : 27 Jan 2022

Objective: The objective of this lab sheet is to make sure you understand basic image processing algorithms - Gamma correction, Thresholding and Contrast Stretching. You will learn how to apply these algorithms to given input images, perform the task and draw inferences from them.

Note: Students should write own function for computing histogram and use it for Questions- 2 and 3.

1. Gamma (γ) Correction:

Write your own MATLAB function to perform γ-correction on a given image.

Input Images: skull.jpg, xray.png

The inputs to the function should be (i) given image and (ii) γ value. The output should be a γ-corrected image. Apply this transform to both the input images for varying values of γ and clearly specify your inferences from these results.

2. Thresholding based Segmentation:

Write your own MATLAB program to perform global thresholding to segment a given image. The inputs should be (i) given image and (ii) Threshold value.

(a) **Input Images:** coins.jpg

By selecting a suitable threshold value, separate the coins from the background.

Display (i) Histogram of the image (ii) Thresholded image

(b) **Input Images:** numbers.jpg

By selecting suitable threshold values, display

(i) All the numbers in white (255) and the background in black (0).

(ii) All the numbers in black (0) and the background in white (255).

(iii) Only a few numbers and make others disappear.

Mention the threshold values fixed for each case and write the inferences.

3. **Contrast Stretching:**

Write your own program to perform simple contrast stretching. The inputs to the function should be the given image.

Input Image: women.jpg, grains.jpg

For the given input images, display the following and write the inferences:

(i) input-histogram,

(ii) Output image after contrast stretching.

(iii) Output-histogram