Objective

The objective of this lab work is to understand image resolution, quantization, different image formats.

Due date to submit project work with report: 15.08.2017. The report will contain explanations of the problem, the way it has been solved and discussion about the results. Also you have to show sample input image and outputs. Add also the Matlab code in the report. Each exercise contains equal weight.

Exercise-1

Understanding Resolution of an image by experimentation.

Problems Statements

i. Download the binary image crossroad.dat. Read the file in matlab using the command fread. The data consist of unsigned characters 8 bits in size, and form an image with line length 580 pixels. The image is 435 lines long. Display the image.

ii. Change this image resolution with boxes 2, 4, 8 and 16 pixels on a side and observe the results. What features do you lose at each resolution size?

iii. Examine the minimum obvious structure size in each case.

Exercise-2

Understanding Quantization (Intensity Resolution) of an image by experimentation.

Problems Statements

i. Read in the original image from the previous problem.

ii. The initial image consists of eight bits of data for each pixel. Create new images using 5, 4, 3, 2 and 1 bit only for each pixel. How many bits are needed to preserve image quality? Does it change from place to place in the image? How so?

Exercise-3

Indexed color

Problem Statements

i. Open and display the single-channel (b + w) image in standford.dat. The image size is 580 x 435.

ii. Using indexed color methods, display the image as shades of blue rather than black/white.

iii. Define a new color table such that the intensity from 0-255 varies the color smoothly according to the following definition:

Pixel value	0	100	200	255
Color	Black	Green	Yellow	White

Display the new image and submit. Here you should design your color table so that the colors vary from black to full-intensity green for pixels 0-100, from green to yellow from 100-200, and from yellow to white from 200-255.

Exercise-4

Working with color transformations.

Problem Statement

Take a color photograph with your still digital camera or with your built in mobile phone camera. Use the MATLAB functions rgb2hsv and hsv2rgb to rotate the hues of your color photograph by 120-degrees (both directions). How could be done the same effect by using directly the RGB components? Show it.