Sheet 3

Computer Vision

Q1. Given an image file stored on the computer write a program to read it and store it in different format (extension) show the effect on the image size on the disk.

Q2. Write a program to read an image and change its type from color image to gray scale image and to binary image and save the output gray scale and binary images show the effect on the image size on the disk.

Q3. Write a program to read an image resize it to be half the width and height.

The program should read the file and print the width, height and resolution before and after resize.

Q4. Write a program to read a color image and split it into R, G, B channels. Display each of them and store them as gray scale image to the computer.

Q5. Write a program to read an image convert to gray scale then calculate and show its histogram. (Apply this program twice first using open cv function for histogram and second without using the function)

Q6. Write a program to read an image convert to gray scale then calculate and display its histogram. Ask the user for a threshold (t**)** to apply the thresholding to convert the image to binary then show the binary image. Use the program to try different values, can you manually estimate the best threshold.

Q7. Repeat the previous question using automatic thresholding. . (apply this program twice first using open cv function for automatic threshold selection and second without using the function). Apply the function by yourself.

Q8. Given the following image file write a program to:

A) Apply a 3 X 3 median filter on the image
B) Apply a 5 X 5 median filter on the image

C) Apply a 3 X 3 mean (average) filter
D) Apply a 7 X 7 mean (average) filter
Compare the results of mean and median filter and different filter size

Q9. Given the following image file write a program to read the image and find the resolution of this image, the bit depth of this image.

- Calculate and draw the histogram of the image (gray scale image).
- Calculate and draw the normalized histogram
- Calculate and draw the cumulative histogram.
- Perform histogram equalization and write the image and draw the histogram after equalization.

Q10. Write a program to read an image, convert it to grayscale image and divide the image into batches (parts). The program should ask user about the batch size. (Display and store the batches).