

## Assignment\_02

Uploaded on 20<sup>th</sup> January 2025

Submission: Before 26<sup>th</sup> January 2025

1. On the following image, apply a) Mean (3x3), b) Median (3x3), c) Gaussian (5x5) filter (sigma=2) and d) sharpening filter (as defined in my slide no. 19 of Lecture 04).

Save the image after each type of filter along with original image (All 5 images on the one or two page) in a **pdf** file. Also provide details of the filters that you used in your answer.

Note: The program should **NOT** make any functional calls from OpenCV OR any other libraries for the filter operation.



2. Draw a fence of an arbitrary shape by hand (!) on a clean paper with white background and printed lines on it as explained in the class. Take a photo of this image. Write a program
  - a) to read the photographed image and translate it to a gray scale image of size say, 300 x 300 of this image.
  - b) Use global thresholding algorithm to clean image to remove all lines on it.
  - c) Save original and binary image by name `fence_original.jpg` and `fence_threshold.jpg`.
  - d) Write a program to draw a filled circle of radius 5 randomly in this image (`fence_threshold.jpg`). Generate 50 such images. Store these images into two folders as explained in the class.
3. Write a histogram equalization code to improve the contrast of following grayscale image.
  - A) Show and save input and output (after histogram equalization) grayscale image.
  - B) Show and save intensity histogram of input and output image.
  - C) Show and save differential probability histogram of input and output image.
  - D) Superimpose the cumulative probability histogram on C); the differential probability histogram of input and output image
  - E) Obtain and store the mean intensity of input and output image

