Workshop #2: **Image processing**

**Learning Outcomes:**

Upon successful completion of this workshop, you will have demonstrated the abilities to:

* Understand the knowledge of point operators, linear filters, nonlinear filters in image processing.
* Write a demo program: Color balance, Histogram equalization, Mean filter, Median filter, Gaussian Smoothing.

**Requirements:**

In this exercise, students are asked to write a simple image processing program that has the following basic functions: performing color balance, calculating histogram- performing histogram equalization. Then apply filters like median filter, mean filter, and Gaussian smoothing. Details of the functions are described below:

**Function 1**: color balance, to perform this function, the user needs to enter the necessary parameters to perform color balance. (can use the slider to represent it visually)

**Function 2**: Show histogram and enter the necessary information to perform histogram equalization.

Function 3: implement the median filter to remove noise in the image(salt and pepper noise)

**Function 4**: implement the Mean filter to remove noise in image (salt and pepper noise)

**Function 5**: implement Gaussian smoothing to perform image smoothing.

Evaluation Criteria

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| No | Criteria | Requires | Mark | Note |
| 1 | Function 1: color balance | color balance | 2 | Using mouse or keyboard |
| 2 | Function 2: histogram- histogram equalization | Show histogram- histogram equalization | 2 | Using mouse or keyboard |
| 3 | Function 3: median filter | implement the median filter | 2 | Using mouse or keyboard |
| 4 | Function 4: Mean filter | implement the Mean filter | 2 | Using mouse or keyboard |
| 5 | Function 5: Gaussian smoothing | implement Gaussian smoothing | 2 | Using mouse or keyboard |
| 6 | Total |  | 10 |  |