ASSIGNMENT 2

PROJECT REPORT

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**Purpose of the Project:**

To understand Image filtering and Enhancement by various techniques.

To perform Unsharp Masking to obtain enhanced image containing the blur and the original image. To perform Sobel operation on input images to obtain edge images of the original images. Finally, to perform Laplacian of Gaussian filter to perform edge detection with two masks 7x7 and 11x11 with different sigma values and compare their outputs.

**Method:**

Performed Unsharp Masking using Gaussian filter to obtain the blur image of the original image. Subtracting the blurred image from the original image to get the non-blurred regions. Then adding this to the original image to obtain the enhanced image.

Performed Sobel Operations on the input images to obtain edge images by calculating gx and gy gradient and then calculating G from . By comparing G with the thresholds, we can calculate the pixel values for the enhanced images.

Performed LoG to obtain 7x7 and 11x11 masks with different sigma values to perform edge detection. 7x7 mask gave better edge information since the smaller the size of mask sharper the images are.

**Results:**

**Original Images *f1, f2***

**A picture containing indoor, sitting, small, table

Description automatically generatedA statue of a person

Description automatically generated**

**Unsharp Masking:**

**A spider on a table

Description automatically generatedA statue of a person

Description automatically generated**

**Sobel Operation:**

**A picture containing necklace

Description automatically generatedA picture containing photo, person, jumping, riding

Description automatically generated**

**7x7 Operation:**

**A picture containing photo, sitting, old, holding

Description automatically generatedA picture containing photo, sitting, old, person

Description automatically generated**

**11x11 Operation:**

**A picture containing sitting, photo, old, table

Description automatically generatedA picture containing photo, sitting, old, person

Description automatically generated**

**Bug Report:** Could not properly Differentiate the differences between the 7x7 and the 11x11 masks output image. Edge Information in the LoG cannot be properly retrieved.

**Steps to run**:

Open terminal:

Change directory to programs folder

Type make to compile and run

**References:**

For LoG edge detection:

<https://academic.mu.edu/phys/matthysd/web226/Lab02.htm>

<https://homepages.inf.ed.ac.uk/rbf/HIPR2/log.htm>