

Spatial Filters - Task 2

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|------------------------|---|---------|
| 1. Sobel Horizontal | - | Vivek |
| 2. Sobel Vertical | - | Anushka |
| 3. Laplacian Operation | - | Advay |
| 4. Gaussian Blur | - | Sishir |

Introduction

Filtering is a technique for modifying or enhancing an image. For example, you can filter an image to emphasize certain features or remove other features. Image processing operations implemented with filtering include smoothing, sharpening etc. Filtering is a *neighborhood operation*, in which the value of any given pixel in the output image is determined by applying some algorithm to the values of the pixels in the neighborhood of the corresponding input pixel. A pixel's neighborhood is some set of pixels, defined by their locations relative to that pixel.

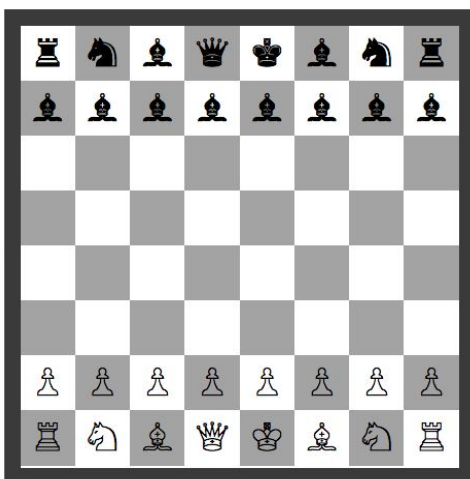
Task

The task here is to read the image, apply the provided filter and display the output image. The output image should be displayed on a "Matplotlib" window. The code should be completely implemented from scratch. No predefined filter function should be used. Do not use openCV.

Libraries:

PIL - To read the image
Numpy - Computation
Matplotlib - Display the image

Sample Input:

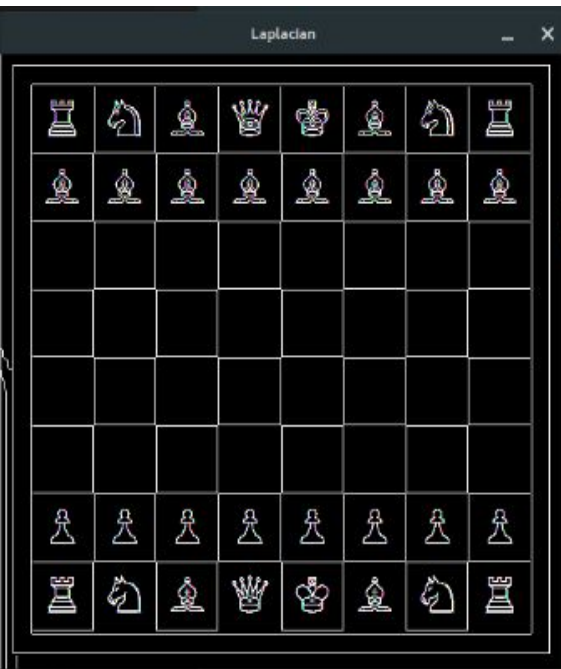


Sample Output:

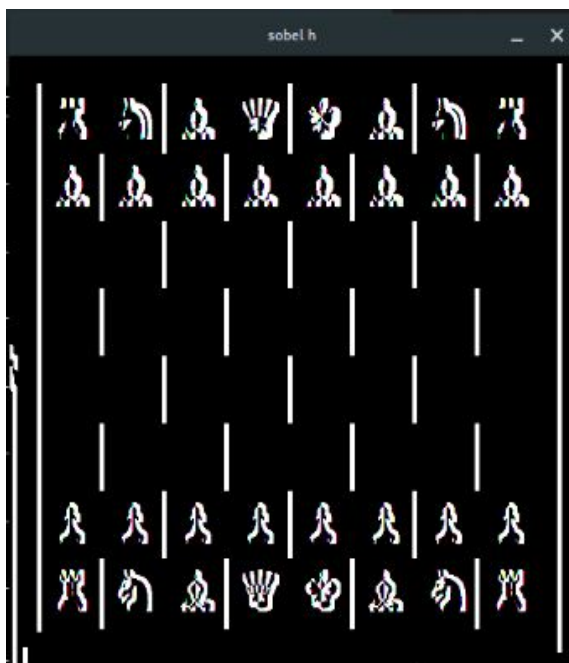
1.Blur



2.Laplacian



3. Sobel Horizontal



4. Sobel Vertical



Reference:

1. <https://www.slideshare.net/sanyam12345/spatial-filtering> - Filtering
2. <https://pillow.readthedocs.io/en/3.0.x/handbook/tutorial.html> - PIL image read
3. <https://www.pyimagesearch.com/2014/11/03/display-matplotlib-rgb-image/> - Matplotlib Disp.
4. You can also refer Wikipedia to know more about the filters.