CmpE 362 Spring - 2020 Project 3 Report

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June 27, 2020

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Chapter 1

Introduction:

In this project, we're given such a task to reconfigure images with given features such as emboss, sharpen or blur. Also, we're requested to draw out the edges in the image to extract meaningful information from the input image. These tasks are given to make us understand the convolution on matrices and the real life applications of the convolution in images.

In the first part, I've blurred the input image with a normalizer kernel, which averages the current and all neighbour cells. Also, I've blurred the input image with a Gaussian kernel to see the difference between the results of different kernels.

In the second part, I've sharpened the blurred images with a sharpener kernel, which extracts the center pixel and reduces the effect of the neighbour pixels to draw out the edges and small details in the image.

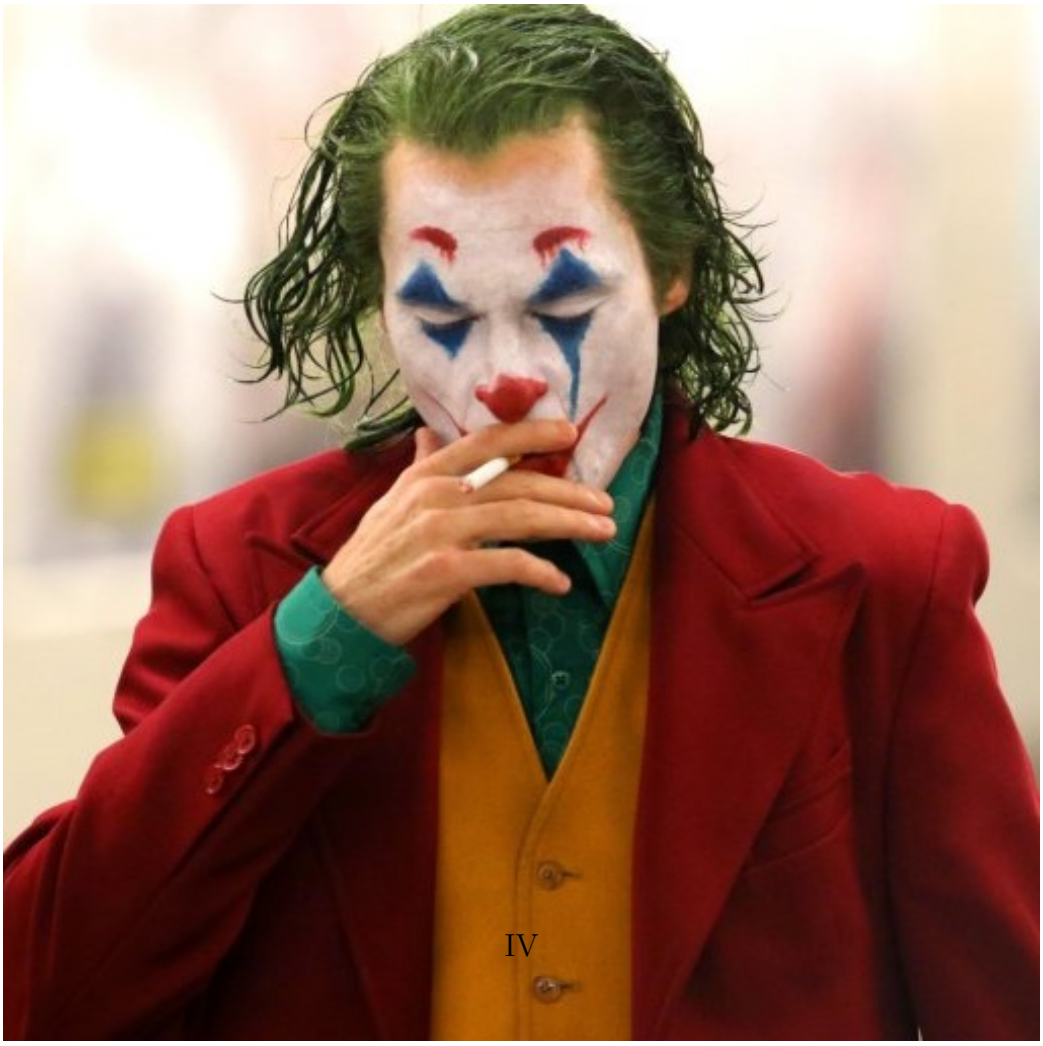
In the third part, I've used a outline kernel to see the edges in the image, which is quite nice to see the outline of any image to understand the objects and structures in an image. The kernel is similar with the sharpener kernel except the central value of the 3x3 kernel is 9 in outline kernel whereas the sharpener kernel has the value 8 in the same place. Also, there's another process that has been done onto the input image in this step. I've used a set of Sobel kernels to detect the edges in another perspective.

Finally, I've used a embossing kernel to emboss the input image to make the image as a 3D portrait. In the next chapter, you'll see the outputs.

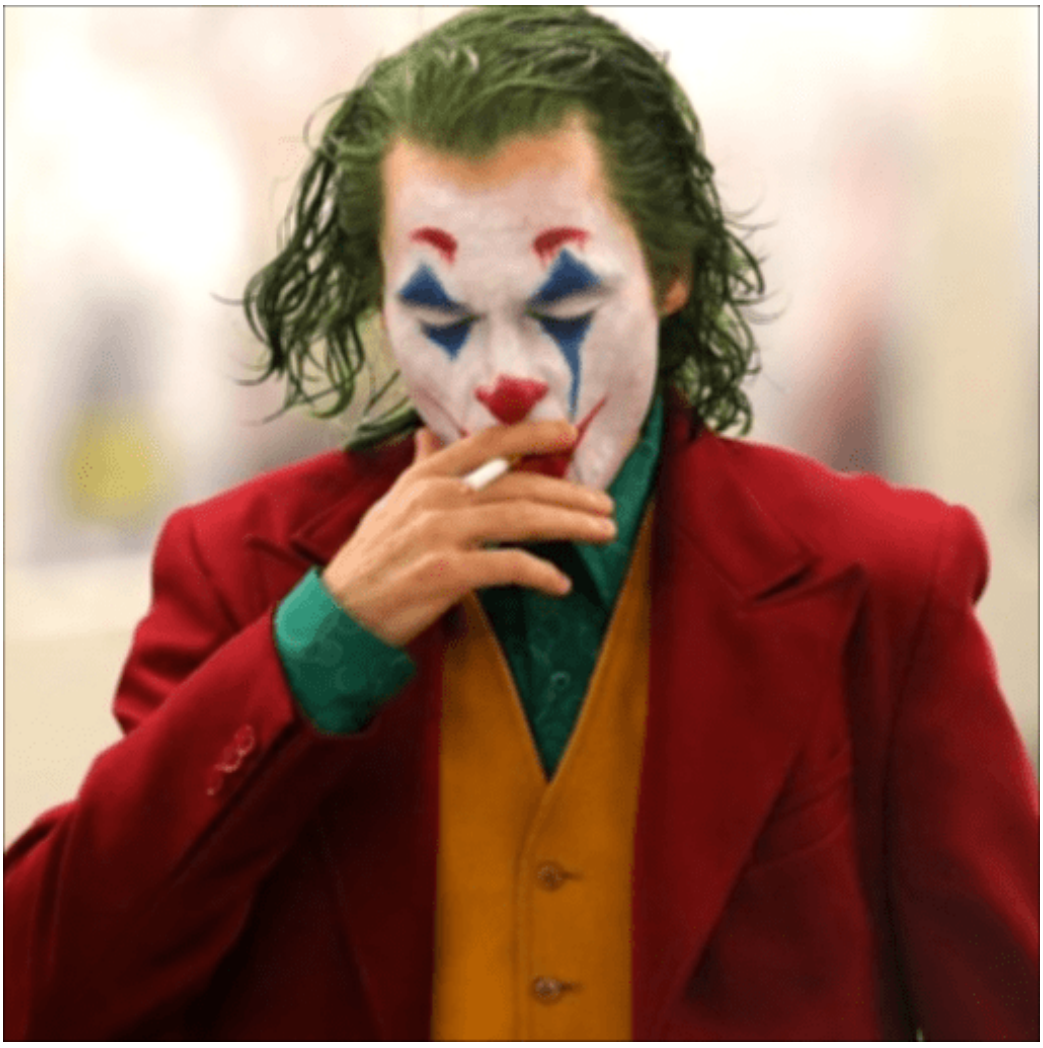
Chapter 2

Outputs:

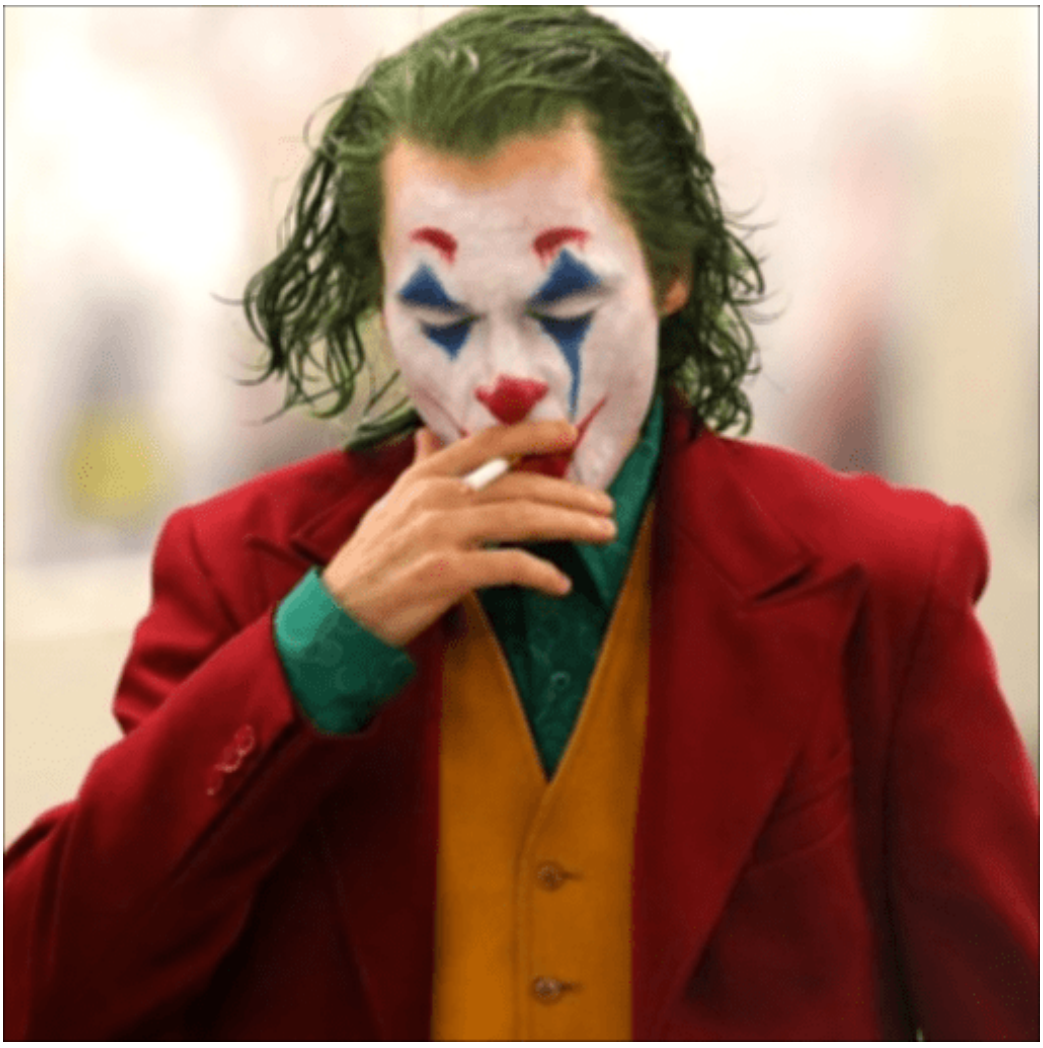
2.1 Raw Input Image:



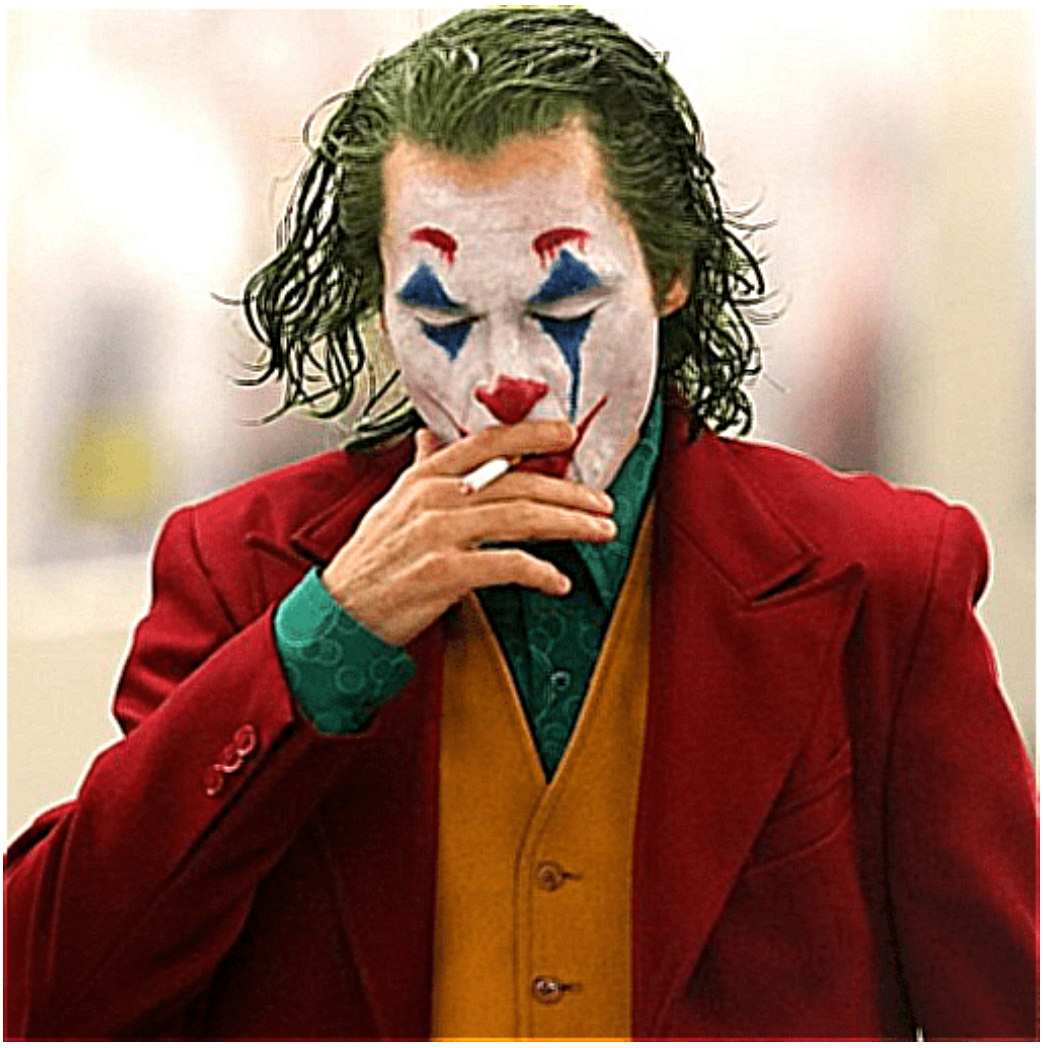
2.2 Normalized Blurring Filter:



2.3 Gaussian Blurring Filter:

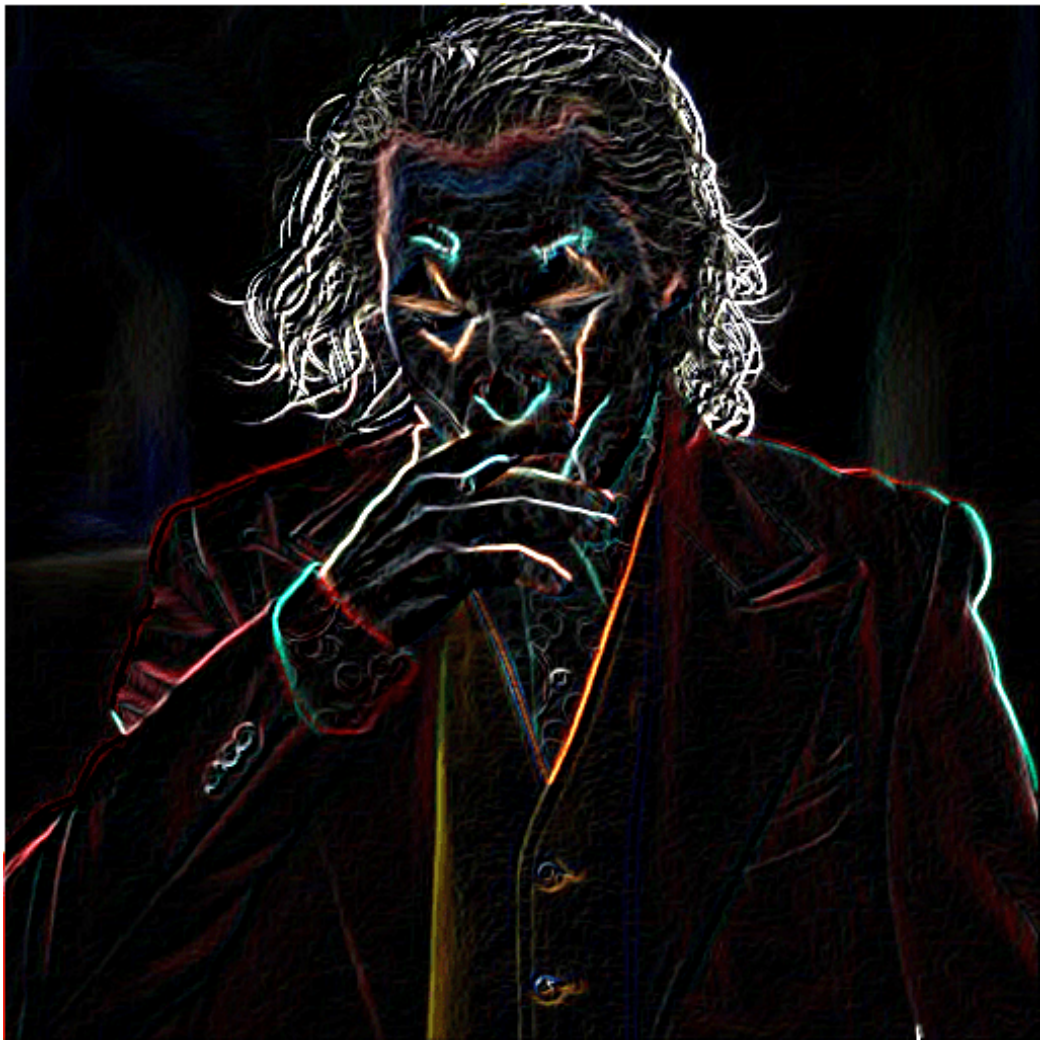


2.4 Sharpening Filter:



2.5 Edge Outlying Filter:

2.6 Sobel Edge Outlying Filter:



2.7 Emboss Filter: