Name: Rohan Jhaveri

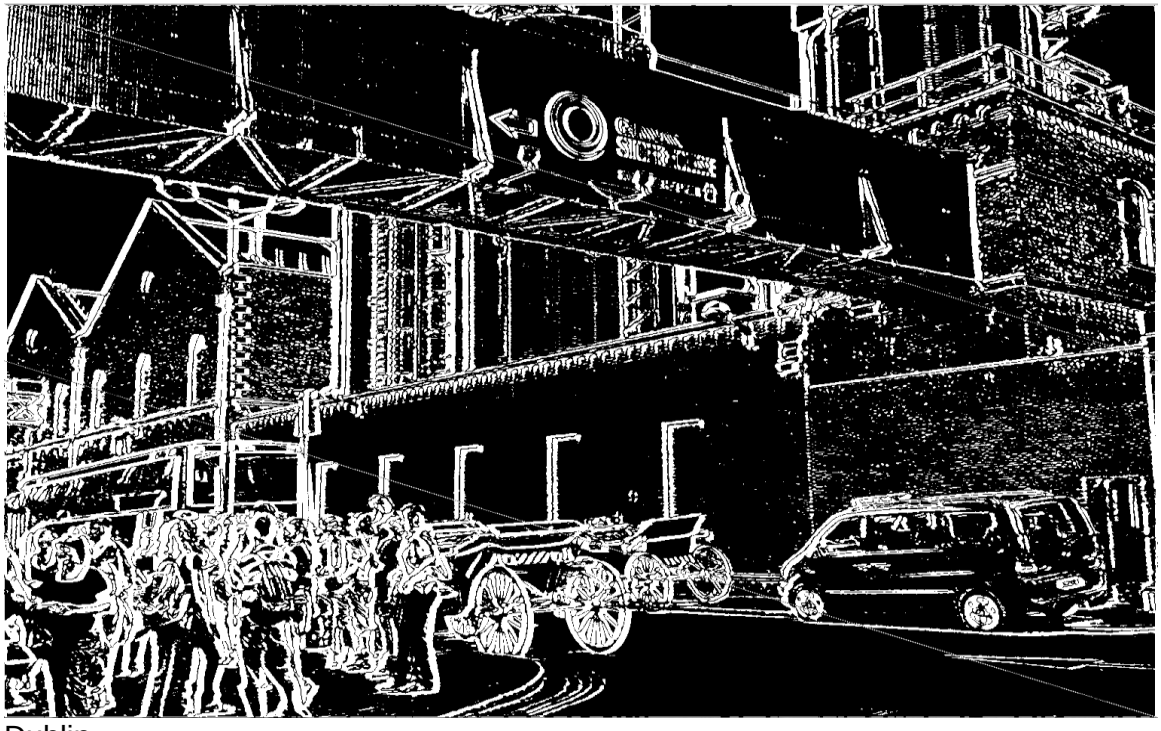
Assignment 3: GPU (CUDA) Image Filters

[Item 1] - For the assignment, submit the .cu file
[Item 2] - Provide the execution time for the Sobel filter:

Input Size	GPU Execution Time	CPU Execution Time	Speedup
lena.bmp	0.189 ms	2.211000 ms	11.69X
dublin.bmp	1.837	57.187000 ms	31.12X

GPU Execution Output:

Lena



Dublin

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We can see that the GPU execution is about 30 times faster than the CPU. This is because image processing algorithms constitute to performing same instructions on several pixels resulting in possibility of a high level of parallelism.

[Item 3] – Implement the Average Filter

Lena

Dublin

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Boost Filter Image:

Lena

Dublin

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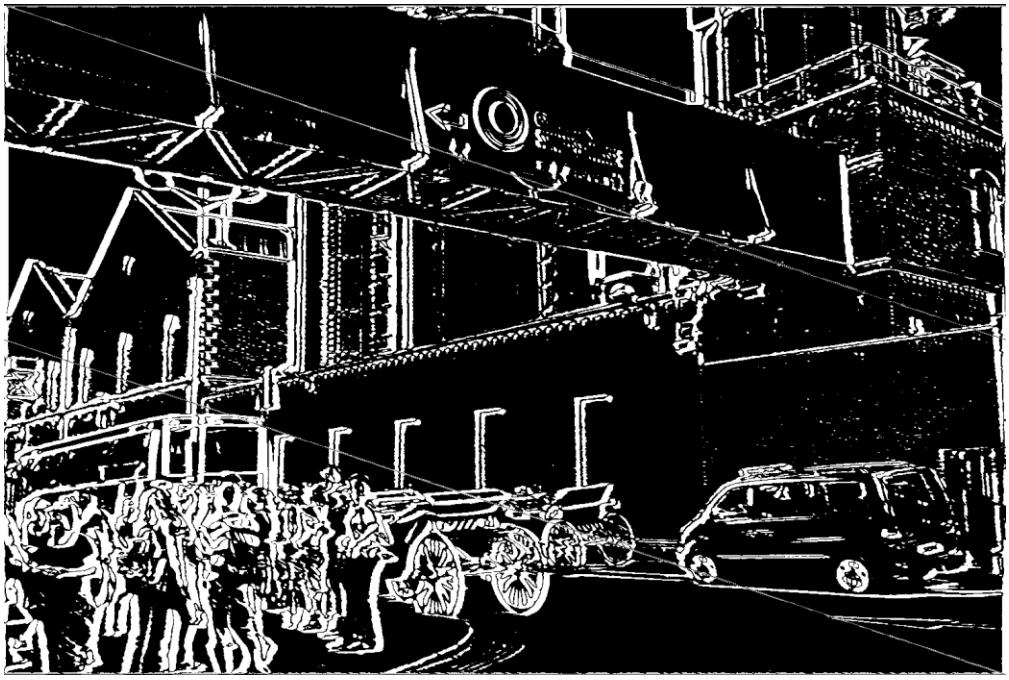
[Item 4] – Graduate Students- Sobel filter 5x5

Input Size	3x3 GPU Execution Time	5x5 GPU Execution Time	Speedup
lena.bmp	0.189	0.247	0.843x
dublin.bmp	1.837	1.895	0.96x

The Threshold Value used to obtain the images below were 1070 which was a lot greater than the previous.

Lena



Dublin