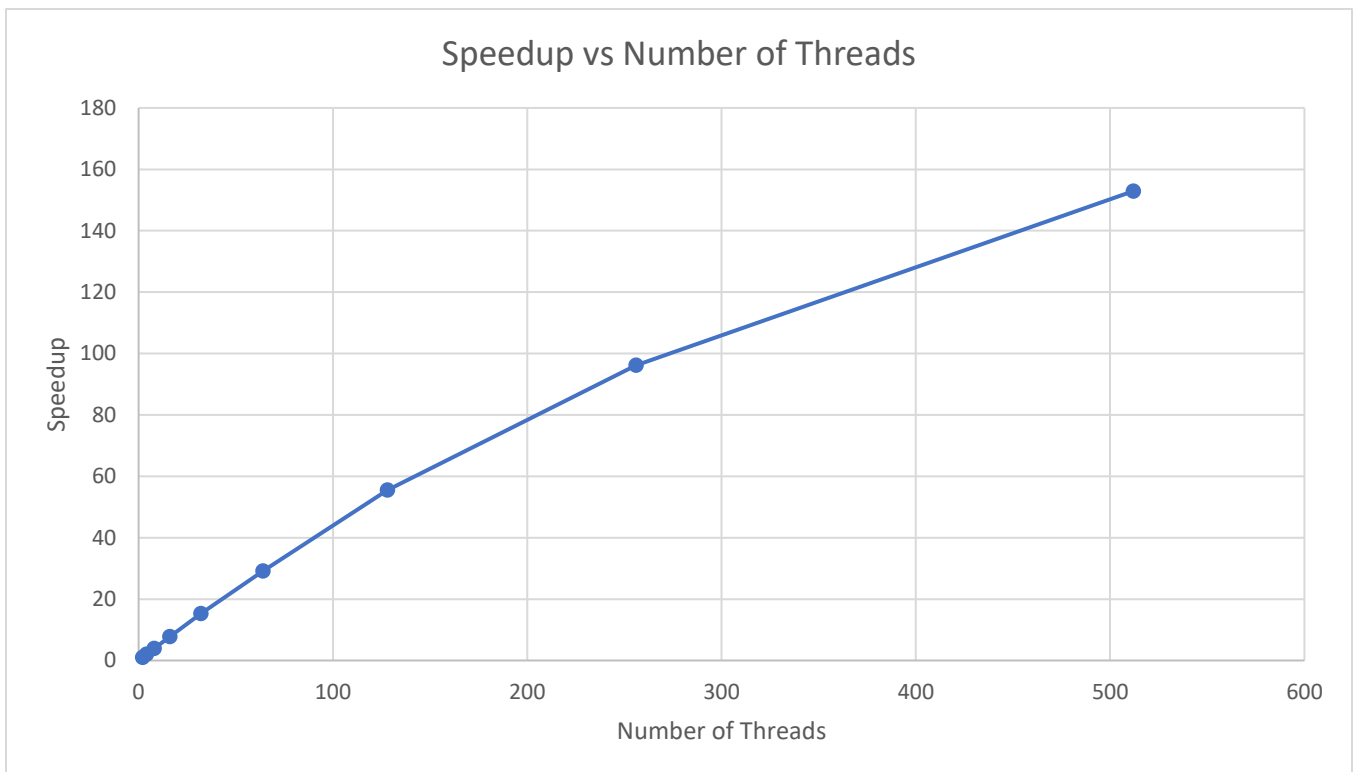


Homework 10 – CUDA Blur Image

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1. Object of the project:
 - a. Use CUDA to redo the previous OpenMP project of blurring an image.
2. Details:
 - a. Use CUDA functions which use communication between CPU and GPU to parallelize the program with a different method. Start by letting the host read the image, then allocate needed memory in the device. Copy the colors from the host to the device, launch the kernel, and let each thread on the device convert one pixel. Afterwards, copy pixels back from device to host and write the file. I found the best times came at 64 blocks with 512 threads called for the kernel function.
3. Results (64 blocks only):
 - a. Number of Threads: [2, 4, 8, 16, 32, 64, 128, 256, 512]
 - b. Time Elapsed (ms): [6463.2769, 3279.3447, 1645.0637, 837.4185, 422.2359, 221.9645, 116.4763, 67.2156, 42.2696]
 - c. Speedup: [1, 1.971, 3.929, 7.718, 15.307, 29.119, 55.49, 96.157, 152.906]



4. Performance Improvements:
 - a. I am unsure what other improvements could be made to this code for greater speedups as it scales quite well with increased threads.