# Problem Set 5 - CUDA RAYTRACING

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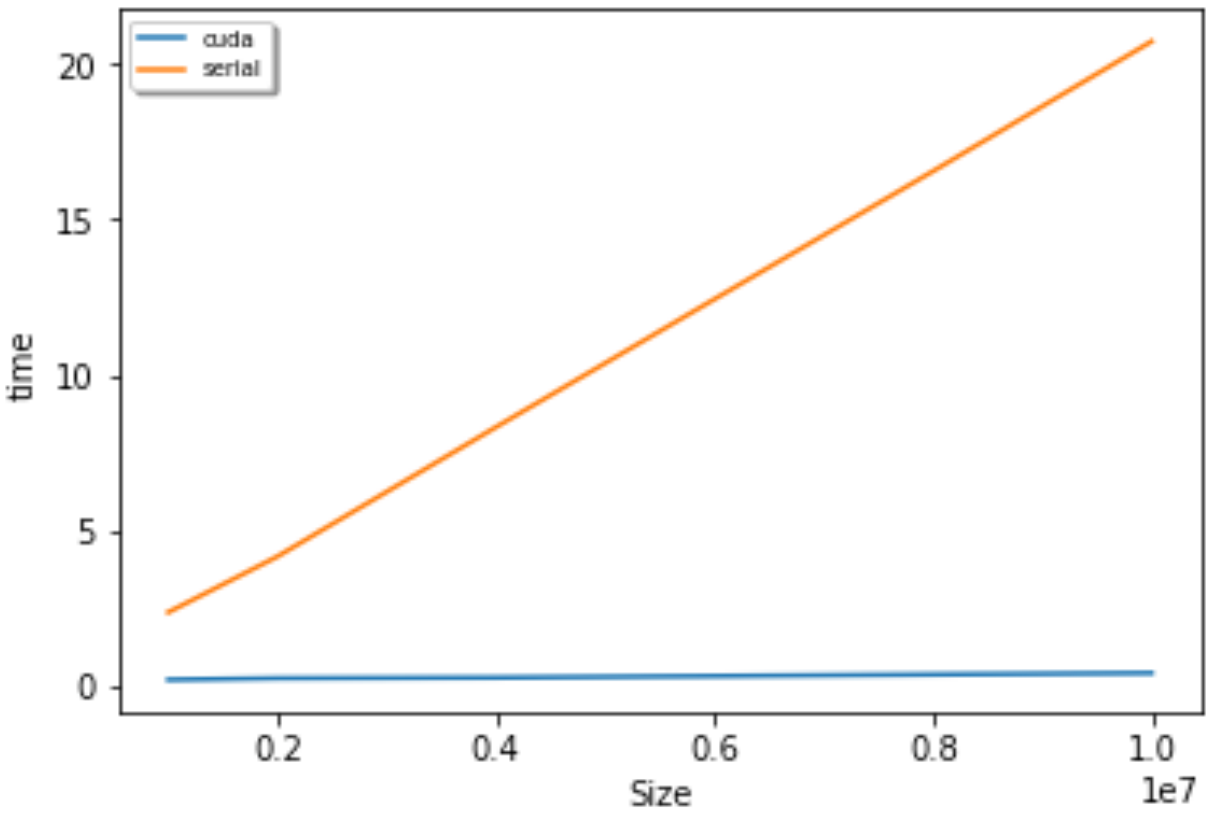
Times for running cuda. I did not experience large changes in running time on cuda. i modified both the threads per block and blocksize but continued to measure times between 0.22 - 0.48 (test runs included in README.txt)

```
blocksize=2000 number of blocks = 14100
Cuda,1410065408, 0.250653
vs. ----
blocksize=20 number of blocks = 70503270
Cuda 0.213495
```

* even though the blocksize and threads*rays per block were adjusted was still getting similar timing. Not sure if this needs to continue to scale so stopped at a few thousand block size

Strong Scaling Study:



*size = [1000000, 2000000, 4000000, 8000000, 10000000]*

*serial = [2.385, 4.18, 8.337, 16.56, 20.73]*

*cuda = [ 0.22, 0.267, 0.287, 0.388, 0.434 ]*

*Summary:*

As the problem size grows, it becomes obvious that a regular cpu cannot keep up with the throughput limit of a GPU. Testing on midway the numbers for gpu did not grow much as size increased from 10^6 - 10^7. On the high end there was maybe a double increase in time for gpu time when running on 10^7 size. Tests were run on a 256 x 256 matrix grid. This is a good example for a comparative example as the ray tracing seems to be very parallel as each gpu can execute on its work and the limit is the hardware on which you are performing the calculation. The serial case grew near linearly as we increased the problem size