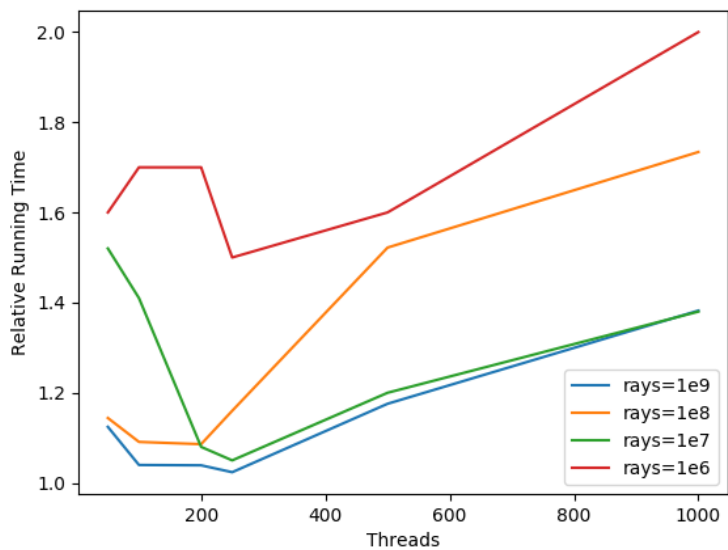# HPC Project 5

Cuda Ray Tracer

1. Experiments about thread configuration

Though the data is noisy in small thread region, we can see for all numbers of rays, thread = 250 would be a good choice.

2. Performance Comparison

Serial code runs on cpu: Intel E5-2670.
Cuda code runs on gpu: Nvidia M2090.

#Rays	10^3	10^4	10^5	10^6	10^7	10^8	10^9
CPU time/ms	0.9	8.0	76.9	718.2	7180.1	71210.1	713418.0
GPU time/ms	7.7	4.7	5.8	14.8	105.2	1160.0	10234.1

1. CPU running time increases almost linearly.
2. GPU running time increases linearly after GPU band-width is full.
3. GPU speedup is about 70x.

3. Sample plotting