CS 575

Project #7A

OpenCL / OpenGL Particle System

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1. The machine I use

I run on my computer.

| System	Windows 10
Processor	Intel(R) i7-6820HK 2.70GHz
Number of Processors	8
RAM	16G
GPU	NVIDIA GeForce GTX 980M
Compiler	Visual Studio 2017

2. Dynamic thing I did with the particle colors

For color part, the particle's color change when they hit the sphere and bounce. In this project, I crate two spheres, one is red and another is green. When the particle hit red one, it will become red, and if they hit the green one, it will become green.

Include at least one screen capture image of your project in action

Show the table and graph

Number of particles	1	2	3	4	5	6	7
GigaParticles/Sec	1.3	1.3	1.3	1.3	1.3	1.3	1.4
Number of particles	8	9	10	15	20	25	30
GigaParticles/Sec	1.4	1.4	1.4	1.4	1.4	1.4	1.4
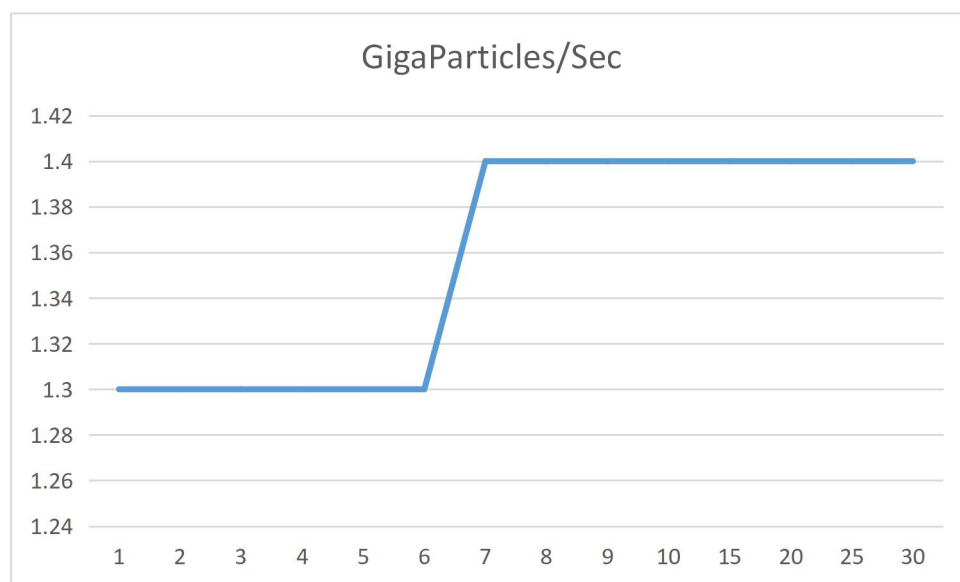
3. About the performance curve

When the number of particle less than 7M, the program didn't use all GPU's performance. So the performance changed from 1.2 to 1.4, but most

time is about 1.3, so I choose 1.3 for 1M to 6M. But after 7M, it keep at 1.4 that means it is full using GPUs.

4. The mean for the proper use of GPU parallel computing

In this project, the performance increase when the number of particles increase. Particle system need a large size of work when the number of particles become really huge. For work with those mess of data, parallel computing seen the best choice. And OpenCL can create buffers for reading, writing and manipulate data in buffer. Parallel computing can get both OpenCL and OpenGL's advantages that can improve the performance.

5. Image