EE/CprE/SE 491 WEEKLY REPORT 3

February 14 – February 20

Group number: 18

Project title: GPGPU Parallelization of Memworld

Client &/Advisor: Dr. Wymore

Team Members/Role:

- *William Blanchard, Parralelization Lead*
- *Mason DeClercq , Team Lead*
- *Jay Edwards, Documentation Lead*
- *Cristofer Medina Lopez, Integration Lead*
- *Dalton Rederick, Communications Lead*
- *Collin Reeves, Game Development Lead*

o **Weekly Summary**

This week, the group had a meeting at the end of the week to discuss what we had done so far and what we wanted to work on for next week. So far, everyone has been able to get Memworld and OpenCL running on Windows, but we are still struggling with the Mac implementation. We decided that next week, we are going to start using Git issues more and document the process of getting Memworld set up. We also are starting to move to implementing a sparse voxel octree into our project in order to get rendering times down. We were able to get the Memworld application to run with OpenCL faster than last week by using 2-dimensional work groups. We have met the requirements for how fast the application was supposed to run with the initial room that we were given. There is still room for improvement, and we should be able to exceed the requirements in the future.

- o **Past week accomplishments**

  - Wil Blanchard:

    - Built and ran the Memworld program
    - Discovered and fixed a memory access error that would occur when running into walls in the viewport

  - Mason DeClercq :

    - Increased the fps of Memworld by adding 2-dimensional work groups on the GPU
    - Researched different voxel rendering algorithms and found out that sparse voxel octrees will be the next thing we should implement to further improve the fps
    - Looked into different ways to determine which GPU to use if the user has multiple
    - Helped with debugging Mac application because the kernel program wasn't compiling correctly on Mac.

  - Jay Edwards:

    - Got my workstation setup
    - Looked into the OpenCL exercises linked by Mason
    - Started a Resources Document for convenience

  - Cristofer Medina Lopez:

    - Did more investigating into OpenCL. Read several documents to gain a better understanding of how to use it and how it interacts with the GPU. Understanding how to write code for OpenCL.
    - Worked on setting up OpenCL with the tools that I am currently using to run the client's application; this is still a work in progress.
    - Trying to debug the memworld application with the OpenCL implementation on Mac
    - Tried to set up the application in the Windows environment.

  - Dalton Rederick:

    - Finished setting up the development environment

  - Collin Reeves:

    - Messed around with various settings of memworld to get different performance results. Got over 30fps when running at 1080p.
    - Helped Dalton and Jay get their memworld instances set up on their machines.
    - Created an issue on gitlab for updating readme with setup instructions.

o **Pending issues**

- OpenCL on mac is appearing to be difficult to get working

o **Individual contributions**

NAME	Individual Contributions *(Quick list of contributions. This should be short.)*	Hours this week	HOURS cumulative
Wil Blanchard	Ran updated OpenCL code, created updated code that prevents crashing when running into walls	4	10.5
Mason DeClercq	Increased fps of Memworld. Looked into different ways to choose hardware on a machine. Researched voxel rendering algorithms. Tried to debug the Mac version of Memworld.	10	27
Jay Edwards	Setup workstation and did some exercises using OpenCL	6	11
Cristofer Medina Lopez	Working with OpenCL to understand how to use it. Looking to get OpenCL to work with Memword on the Mac system.	3	12
Dalton Rederick	Finished setting up development environment	4	10.5
Collin Reeves	Got memworld to run on my computer	4	10

o **Plans for the upcoming week**

  · Wil Blanchard: Study sparse voxel octrees and help implement it.

  · Mason DeClercq : Work on implementing a sparse voxel octree for rendering.
    Move kernel program from string into its own file.

  · Jay Edwards: Continue learning about OpenCL, finish the Resources Doc, research sparse voxel octrees

  · Cristofer Medina Lopez: Debugging the OpenCL on the Memworld application so it can run on Mac. Plan on starting research on Sparse Voxel Octrees.

  · Dalton Rederick: Read up on Voxel Octrees and to play around with the current Memworld setup to further understand the current code.

  · Collin Reeves: Write instructions on README file for how to set up the project on both Mac and Windows.

o **Summary of weekly advisor meeting**

  We didn't hold an advisor meeting this week because we decided on having one every other week, unless there is an emergency.