EE/CprE/SE 491 WEEKLY REPORT 5

February 28 – March 6

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. Mac implementation progress is moving forward. There is still no output to the screen, but that is also something that we have encountered when first implementing the Windows version, so we believe it is getting close to working. We changed directions from a sparse voxel octree to just a voxel octree in which every voxel is included in order to stay within requirements. Instructions for Mac setup have been written, but still need to be added to the README file. We added a .vox file importer to make creating objects in the world easier. Physics is starting to be implemented as well as multithreading and movement.

- o **Past week accomplishments**
  - · Wil Blanchard:
    - Met with Dalton to explore how to handle world and object creation in the Memworld rendering engine
    - Met with Collin to explore possible ways to introduce physics into the Memworld test environment
  - · Mason DeClercq:
    - I tested my octree traversal algorithm to determine that it was working correctly when trying to traverse multiple voxels at a time. Decided to try a different route in the octree representation.
    - Cleaned up the Git pending merges
    - Cleaned up the .vox file importer functionality
  - · Jay Edwards:
    - Found resources on how to setup Multithreading
    - Experimented with Multithreading
  - · Cristofer Medina Lopez:
    - Program runs OpenCL implementation however still doesn't display images to the memworld program
    - Looking over XCode setup implementation for OpenCL for memworld
    - Posted Mac version installation for the README file of the project repository
    - Trying to debug the OpenCL implementation of memworld on Mac, specifically the kernel source code for the project.
  - · Dalton Rederick:
    - Looked into different export types with MagicaVoxel
    - Looked into how importing a new world would work in memworld (looked through provided code)
    - Realized at the end of the week that the Sparse voxel octrees branch has support for loading .vox files
  - · Collin Reeves:
    - Worked on implementing physics into memworld.
    - Got a cube to be able to fall and collide with the ground.

o **Pending issues**

  - OpenCL on mac is appearing to be difficult to get working. Issues with the kernel being initialized and built properly.

o **Individual contributions**

NAME	Individual Contributions *(Quick list of contributions. This should be short.)*	Hours this week	HOURS cumulative
Wil Blanchard	Met with Dalton and Collin to strategize creation of Memworld test environment features	3	17.5
Mason DeClercq	Tested octree traversal, Git cleanup, cleaned up .vox import functionality.	6	41
Jay Edwards	Experimented with and Researched Multithreading	4	18
Cristofer Medina Lopez	Verifying OpenCL implementation on Memworld on Mac system and debugging the kernel source code to correct issues.	8	26
Dalton Rederick	Met with Wil and Collin and worked on implementing a new world file. Looked through provided code to attempt to achieve that goal	4	17.5
Collin Reeves	Worked on implementing physics into memworld. Got a cube to be able to fall and collide with the ground.	5	18

- **Plans for the upcoming week**

  · Wil Blanchard: Focus on physics development, determine the best method of parallelization of the tick process if needed.

  · Mason DeClercq : Continue working on voxel octree implementation, but change direction so it is a direct memory implementation. Clean up Memworld.c by removing commented out functionality and moving functions into their own c file.

  · Jay Edwards: Try to implement Multithreading into Memworld

  · Cristofer Medina Lopez: Debugging the kernel source code for OpenCL for Memworld application so it can run on Mac.

  · Dalton Rederick: Load .vox with provided Octree code. Create a new test environment in magicaVoxel to look into engine responses to different environments.

  · Collin Reeves: Look into more physics, having potential bouncing, velocity, etc.

- **Summary of weekly advisor meeting**

  We did not have an advisor meeting for this week.