

## ***EE/CprE/SE 491 WEEKLY REPORT 8***

***March 28 – April 3***

***Group number: 18***

***Project title: GPGPU Parallelization of Memworld***

***Client &/Advisor: Dr. Wymore***

***Team Members/Role:***

- ***William Blanchard, Parallelization Lead***
- ***[Mason DeClercq](#), Team Lead***
- ***Jay Edwards, Documentation Lead***
- ***[Cristofer Medina Lopez](#), Integration Lead***
- ***Dalton Rederick, Communications Lead***
- ***Collin Reeves, Game Development Lead***

### **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. The Mac build of the project is now working, satisfying our portability requirement. Multithreading and physics is continuing to be implemented. The octree being implemented into the renderer is working on the CPU but not the GPU, so more debugging is needed for that implementation. Work on the environment/world is being done in order to move the group closer to utilizing a correctly sized and filled world for testing.

- **Past week accomplishments**

- Wil Blanchard:
  - Helped implement threading examples with Cristofer and Jay.
- [Mason DeClercq](#):
  - Changed doubles to floats in the kernel program speeding up framerate
  - Implemented Octree in CPU version of Memworld, but couldn't get it working with the GPU version
  - Researched different memory types in OpenCL because the global type has a high latency for access. There are no better options for our current implementation. There is a possibility to use the local type for caching in the future.
  - Helped Cristofer with getting the Mac build working
- Jay Edwards:
  - Worked on implementing multithreading. Met with Wil and Cristofer on that topic
- Cristofer Medina Lopez:
  - Worked with Wil and Jay to discuss/implement multithreading capabilities to help make the application more efficient.
  - Got Mac working with Mason.
- Dalton Rederick:
  - Added select prompt for world load
  - Changed world bounds to 256/256/256
  - Changed walls to black
  - Changed file load to place next to wall, not in it
- Collin Reeves:
  - Continued bug fixing physics algorithm, making progress with gravity.

- **Pending issues**

- No pending issues at this moment

- **Individual contributions**

<b><u>NAME</u></b>	<b><u>Individual Contributions</u></b> <i>(Quick list of contributions. This should be short.)</i>	<b><u>Hours this week</u></b>	<b><u>HOURS cumulative</u></b>
Wil Blanchard	Worked with Jay and Cristofer on multithreading	3	24.5
Mason DeClercq	Changed doubles to floats in kernel, implemented octree in CPU, researched different OpenCL memory types, helped get Mac working	9	66
Jay Edwards	Continued working on multithreading with Wil and Cristofer	6	29
Cristofer Medina Lopez	Worked with Jay and Wil to discuss/implement multithreading. Finally got Mac working with Mason.	4	34.5
Dalton Rederick	Added select prompt for world load. Changed world bounds to 256/256/256. Changed walls to black. Changed file load to place next to the wall, not in it.	4	27.5
Collin Reeves	Working on bug fixing the physics algorithm, making gravity work better.	4	28

- **Plans for the upcoming week**

- Wil Blanchard: Implementing Multithreading for:

- Thread for process input

- Thread for compute kernel functionality
  - Thread for glfwPollEvents?
  - Thread for glTexSubImage2D?
  - Thread for physics with timing
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- Mason DeClercq : Voxel octree implementation in kernel program, see if multiple kernels can run on the same GPU and determine how running multiple kernels works.
  - Jay Edwards: Try to get large environments imported. Try implementing a settings file
  - Cristofer Medina Lopez: Do research into OpenGL and OpenCL interoperation.
  - Dalton Rederick: Work on fixing issues with loading large files. If fixed work on creating custom testing stage
  - Collin Reeves: Finish up gravity, look into adding in jumping.

- **Summary of weekly advisor meeting**

Demonstrated the current state of the project to our advisor to see implementations that were made from the time the project was given to our group. Discussed plans moving forward with the project. This included what type of demonstration application that our group plans on making.