

## ***EE/CprE/SE 492 BI-WEEKLY REPORT 10***

***August 31 – September 14***

***Group number: 18***

***Project title: GPGPU BParallelization 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***

### **○ Bi-Weekly Summary**

Over the summer and the past two weeks that this bi-weekly report covers, a new implementation of the rendering system has been implemented. This new implementation allows objects to be moved more efficiently to better work with the physics system. It is based on bounding boxes around the objects that we are importing. Ray based lighting has also been implemented within the bounding boxes. There is also an option to set the pixel density to a higher value in order to increase performance with a degraded image quality. Work on physics, threads, UI, and interoperability is continuing to be implemented.

## ○ Past weeks accomplishments

- Wil Blanchard:
  - Tested multithreading to attempt to find the cause of the camera jumping away from the world's origin point
- Mason DeClercq :
  - Worked on cleaning up the branch that I worked on over the summer and fixing test cases
  - Implemented a new bounding box rendering technique to hopefully help with physics
  - Objects can now also have an x based rotation
  - Worked on making a pixel density parameter for weaker gpu's with lower thread count
  - Worked on making diagrams for the new render technique
  - Tried to determine if ambient occlusion would be easily implemented for lighting
  - Implemented ray based lighting within the bounding box of object
- Jay Edwards:
  - Fixed the settings file changes and merged it to master
  - Started looking into displaying a HUD to the player
- Cristofer Medina Lopez:
  - Continued implementation of OpenCL/OpenGL interoperability for Memworld. Worked on debugging context creation issues that have emerged with the new Memworld implementation.
  - Interop Context created successfully in new Memworld Implementation.
- Dalton Rederick:
  - Worked on getting object generation to work in the command line on startup.
  - Began laying out functions for object generation in the command line while program is running
- Collin Reeves:
  - Merged in new changes Mason made to the Main branch into physics algorithms.
  - Starting work on collision detection using bounding boxes.
  - Led discussions on game to develop through this semester
    - Created document for these discussions for us to look at

○ **Pending issues**

- *Threading makes the player jump back every now and then. It is not to a place the player has been previously either.*

○ **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 worked</u></b>	<b><u>HOURS cumulative</u></b>
Wil Blanchard	Testing for the source of multithreading issues	2	31.5
Mason DeClercq	Implemented new rendering technique, pixel density parameter, and ray based lighting	30 (summer) + 16	120
Jay Edwards	Worked on implementing a settings file	5	36
Cristofer Medina Lopez	Implementing OpenCL/OpenGL interoperability. Debugging issues with building program from source. Interop Context created.	7	46.5
Dalton Rederick	Worked on command line object spawning, primarily on startup	6.5	38
Collin Reeves	Merged in new changes from the main branch, starting work on collision detection using bounding boxes. Led discussions on ideas for game to make throughout the semester.	6	38

- **Plans for the upcoming weeks**

- Wil Blanchard: Work more on multithreading, help with the implementation of the starting world.
- Mason DeClercq : Clean up ray based lighting branch. Implement starting world, jumping, and basic collision
- Jay Edwards: Continue looking into HUD implementation, Mason found some great resources for it. Try to get at least some words to overlay on the screen.
- Cristofer Medina Lopez: Continue with Interop implementation. Looking into working with creating new memory objects for sending OpenGL data.
- Dalton Rederick: Finish up color palette chooser and begin creating test cases for the importer.
- Collin Reeves: Dive further into bounding boxes, gravity. Add more details to the game design document.

- **Summary of the advisor meeting**

We met with our advisor and explained the new implementation of the rendering system to him. He was a little confused with the explanation, so a diagram was made in order to improve understanding in the future. We gave a demonstration of the current application with the ability to change worlds. We also explained our direction for the application. Our advisor/client expressed interest in collision detection per voxel in our application.