EE/CprE/SE 491 WEEKLY REPORT 4

February 21 – February 27

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***

- **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. Mac implementation progress is moving forward, however there are still some bugs that are being fixed with regard to the kernel. We are continuing to try to implement the concept of a sparse voxel octree into our project. We have our README file updated with the Windows setup instruction posted. We have also continued to work toward fixing bugs that are in the current state of Memworld; one thing that we implemented was proper platform array and voxel density fix. This should help fix issues with crashing while users are running into walls. There is still room for improvement, and we should be able to exceed the requirements in the future.

- **Past week accomplishments**

  • Wil Blanchard:

    - Did research on sparse voxel octree, created merge request for “engine crashing when player runs into wall” bugfix.

  • Mason DeClercq :

    - Developed a way to import MagicaVoxel (.vox) models into our project.
    - Researched quick raycasting in a sparse voxel octree in order to traverse it effectively. It is closely related to how the game Wolfenstein renders its maps.
    - Started implementing the sparse voxel octree.

  • Jay Edwards:

    - Continued going over OpenCL exercises
    - Proofread Collin’s readme
    - Tested how to expand movement options in Memworld

  • Cristofer Medina Lopez:

    - Did more investigating into OpenCL. Found documentation on context and object sharing for Mac.
    - Trying to debug the memworld application with the OpenCL implementation on Mac. Fixing issues with the kernel building to be able to run OpenCL.

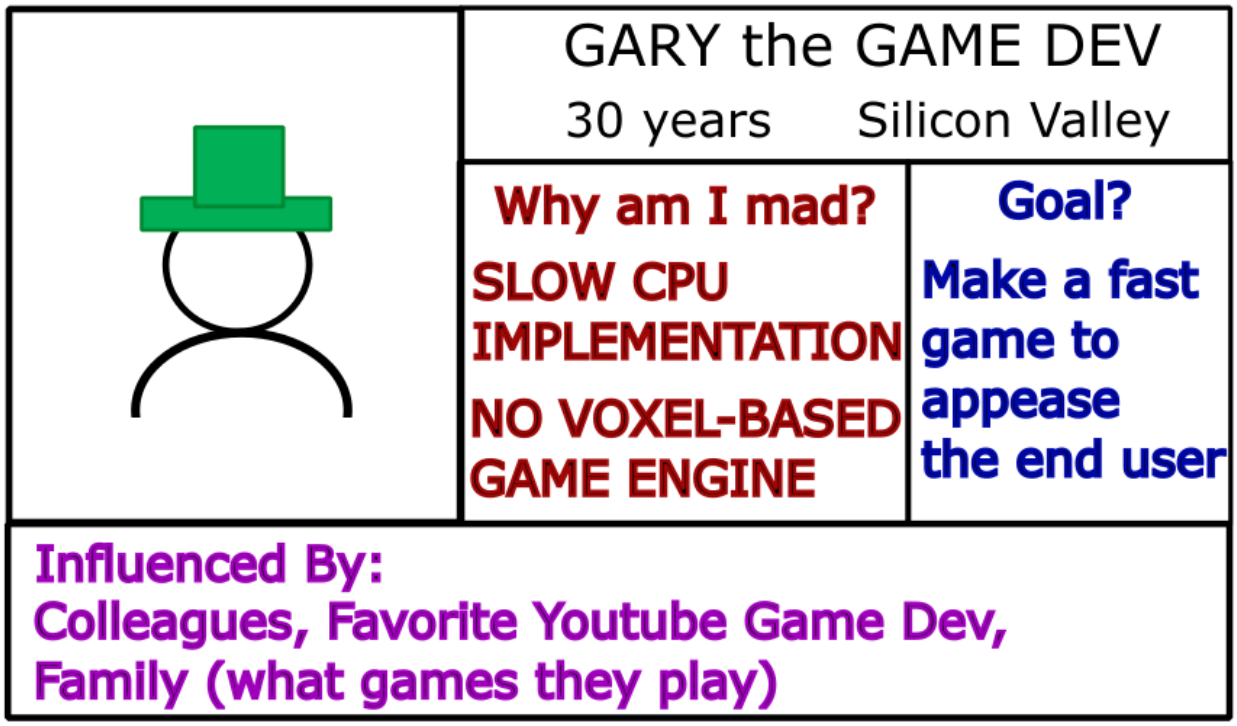
  • Dalton Rederick:

    - Read documents about Octrees
    - Explored MagicaVoxel, a voxel asset creator and importer
    - Started looking into implementing more movement options in Memworld

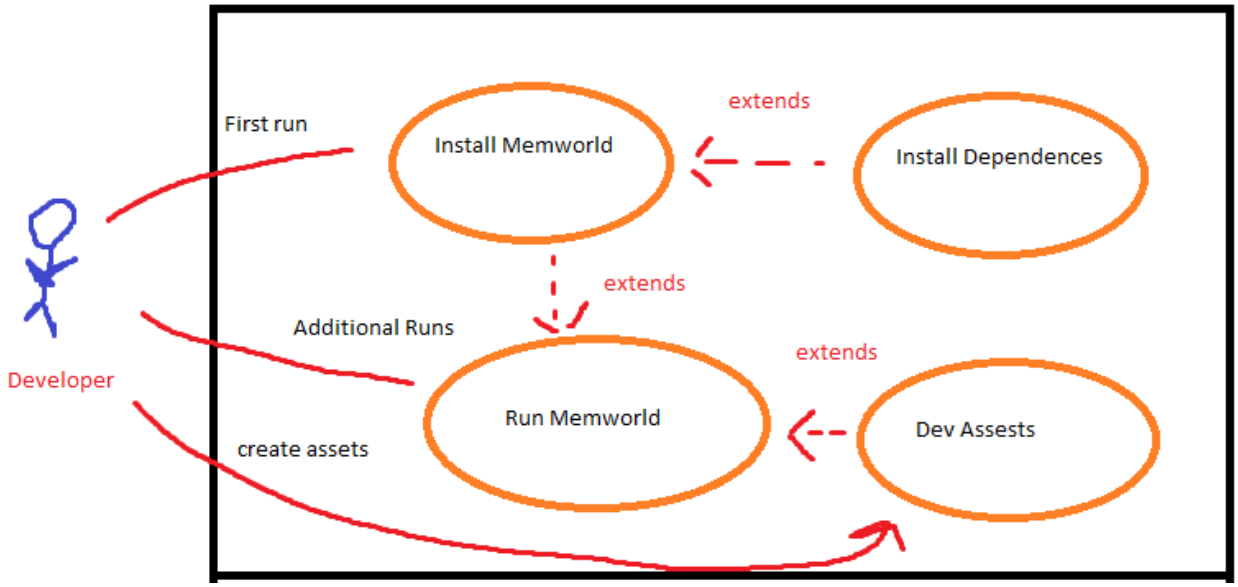
  • Collin Reeves:

    - Finished updating the readme file with documentation on how to set up the project.
    - Reviewed one of Mason’s merge requests

Required Material For Assignment:



Memworld use cases



- **Pending issues**

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

- **Individual contributions**

NAME	**Individual Contributions** *(Quick list of contributions. This should be short.)*	**Hours this week**	**HOURS cumulative**
Wil Blanchard	Did research on sparse voxel octree, created merge request for “engine crashing when player runs into wall” bugfix.	4	14.5
Mason DeClercq	Developed import function for .vox files, researched quick raycasting on sparse voxel octrees, and started implementing the sparse voxel octree	8	35
Jay Edwards	Continued learning about OpenCL, finished resources doc, toyed with movement in Memworld	3	14
Cristofer Medina Lopez	Looking to get OpenCL to work with Memword on the Mac system. Debugging kernel setup for the Memworld	6	18
Dalton Rederick	Researched Voxel Octrees, looked into MagicaVoxel, looked into wasd movement	3	13.5
Collin Reeves	Added documentation for how to set up windows workstations in readme file.	3	13

- **Plans for the upcoming week**

  • Wil Blanchard: Begin developing solutions for world creation and physics functions within memworld

  • Mason DeClercq : Finish naive sparse voxel octree implementation.

  • Jay Edwards: Continue learning OpenCL, look into implementing threads

  • Cristofer Medina Lopez: Debugging the OpenCL on the Memworld application so it can run on Mac. Read more on context and object sharing for the Mac implementation. Get a rough draft for README on Mac up for Collin.

  • Dalton Rederick: Learn how to utilize MagicaVoxel, get wasd movement working, work on creating new test environment for memworld.

  • Collin Reeves: Look into various future goals, ie: physics, lighting, games with openGL. Additionally, look into "MagicaVoxel" for adding in different types of objects into our world such as spheres or pyramids.

- **Summary of weekly advisor meeting**

This week, our advisor meeting consisted of updating our advisor on our status in the project and where we plan to take it within the next week. The latter part included the explanation of sparse voxel octrees and why they might be useful to use in the engine. We also discussed who we expected our end user to be, which we had all concluded was either a game developer or a data scientist, and whether our end goal for this project was going to be a game engine. We had decided that what we have right now is supposed to be developed as a rendering engine, but that it could become more game engine-esque as we included more aspects of physics and asset management.