**CppPrimitiveRenderer Brief**

* **The purpose of the system:** This system is intended to allow a user to quickly render primitives in their (basic) graphical application (similar in nature to the AIE bootstrap library). The library may give the user additional options such as the ability to use textures on the primitives rendered and effects such as transparency or lighting. I will attempt to program the library to be as efficient and effective as possible with my ability.
* **The libraries it relies on:** This library would be made using C++ for use with other C++ applications and implement the GLFW OpenGL Library and the GLM OpenGL Mathematics library.
* **The mathematical operations to be used:** Most of the typical 3D graphics math will be required for this library including vector math and matrix transformations. Additional math may be utilized in areas such as shaders (ray casts, color manipulations etc..).
* **How it will be made modular and able to be integrated in existing applications:** The library will be designed to work with programs which implement some sort of game/logic loop. The library will have few simple functions which can be called at any time by the user to draw and manipulate primitives. Few functions may be required to be called in a specific order by the user such as a “begin rendering” function and a “finish rendering” function. The libraries main class may be able to be initialized by the user with or without an existing OpenGL Context allowing for more compatibility. The user may be required to add certain types of render objects in a specific order for them to render properly, such as transparent objects. Memory management will be handled by the library for the most part, however, it will be the user’s responsibility to call the appropriate initialization and clean-up functions when starting and closing the application.