Jeremy Bridges

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I have included, as my artifact of software design/engineering, a computer graphic project which involved using C++ language and the OpenGL API. The original project was completed in my computer graphics and visualization class in December 2019. We used OpenGL and associated libraries including GLFW, GLEW, GLM and SOIL to draw objects within a window displayed on screen. We chose an everyday simple object and created a digital representation of that object, including color, texture, and lighting features.

This artifact was the most complex program I developed while at school which also involved writing the most amount of code. The program required a lot of learning to understand how the different components work. We had to learn how multiple different libraries worked. We had to use our knowledge of matrices to manipulate the math to create 3d objects. We used callback functions to control camera functions while drawing the object on screen. We learned and implemented shader programs which attach colors and textures to objects. We also learned vertex and element buffer objects and vertex array objects and how they are used to store information about the objects that we will draw onscreen.

The enhancement plan for this artifact included adding another object to the scene, fixing a feature that allows person to switch between a 2D and 3D view of object and cleaning up some of the code to make it more efficient. The enhancement plan was completed successfully for this artifact. We added a floor which the stool sits on, adding a little more complexity to the scene. The feature to switch between orthographic and perspective views was successfully added. We were also able to remove some code which was repetitive.

The more difficult part of the enhancement was adding the feature of switch view types. It took some time trying to figure out the correct implementation of the feature and only by stepping back from a code level and looking at it from a more abstract level, did the solution come to me. Adding the floor object was not difficult, but it did take some time to manipulate polygons by translating, rotating and scaling them till they resembled a floor. Revisiting and enhancing this project allowed me to get a better grasp of the components of the program and how they work to display objects in a window.