

The artifact that I chose for this enhancement is titled milestone cs330. It was the final for class CS330 which presented 3d graphical object coded using OpenGL. Due to my passion for art (as seen in my previous bachelor's degree of Digital Media), I thought this would be a good piece to showcase my abilities to develop 3d objects in an abstract environment. My previous portfolio work in 3d animation displayed my ability to draw in a 3d environment therefore this piece adds an additional layer to my ability to create art utilizing code rather than 3d drawing tools.

In the original artifact the scene was simply a textured chair. In the enhancement I have added a desk to accompany the chair. This enhancement required coding of 56 additional vertices and 88 additional vertexes to produce the desk within the scene. Placing an object in an environment in relation to another object requires an understanding of the points amongst the three axes of XYZ as well as an understanding of scale in relation to the object already present within the scene. Not only is it important to create an object that scales well with another object but also to create an object that does not intersect thus melding with active object in the scene. In addition, an adjustment of lighting was required in both position and strength by not only moving the light source further into the scene to allow for a greater display of shadow but also through an adjustment in specular light strength to create greater contrast in shadow. Other enhancements involved cleaning up missing polygons within the first model and adjusting the production of the number of polygons present for the scene. This clean up required multiple diagrams to be visually understand the missing polygons that needed to be implemented. Upon this adjustment and cleanup there was a need to adjust the texture coordinates within the VAO of the original object to allow for a more uniform texture placement thus removing the texture seams in the previous iteration of the project. Lastly, I did attempt to include a secondary texture to the

second object but have failed at producing that result. I attempted to utilize a texture array but failed at implementation upon rendering the scene resulting in nothing, but a screen returned black.

Regarding course objectives, I believe that in this enhancement my goal and course objective was to expand a project's complexity. Originally, I think the initial idea was to improve a piece of software but during my creation of this enhancement I misunderstood the type of objective I was mentally trying to accomplish. This objective was achieved by directly creating a secondary object through the plotting of vertices and vertexes. Furthermore, the adjustment of lighting sources, placement, and strength to produce more dramatic contrasts in ambient, specular, and diffused lighting sources as well as a greater shadow contrast furthers this expectation. Lastly the adjustment and cleaning of some of the original plot points to fix missing polygons I felt adhered to this objective as well as technically improving the output of the software shown in the new scene being produced. Further modifications were implemented in the texture coordinates within the VAO which allowed for a seamless texture output in comparison to the original rendered scene that displayed textures that had clear texture seams visible on the model. These issues were rectified within this adjustment. In conclusion, despite missing the implementation of a secondary texture, the objective of expanding a project's complexity can be visible in the addition and modifications made to the original scene. This objective meets the course outcome of an ability to demonstrate an ability to use well founded and innovative techniques, skills, and tools in computing practices for the purpose of implementing computer solutions that deliver value and accomplish industry specific goals. These modifications and adjustments (despite the lack of the implementation of secondary textures) adheres to the industry standard of producing complex graphical models within an

Open GL environment as well as producing lighting and adequate texture for said models. In creating the enhancements, I have learned about how to meticulously design an object within a scene as well as how to model within and in relation to another object. I have learned that in cleaning up my previous model that the vertex array was missing some points resulting in missing edges and a tearing within the model. Furthermore, the implementation of a physical drawings can be beneficial when understanding how a 3d object can be constructed as well as providing insight into the correction of a current object. Despite not being able to implement a secondary texture, cleaning up the texture seams of the original project allowed me to understand the idea of texture coordinates in greater detail. Lastly, In attempting to add an additional texture I learned that several calls within the `uGenerateTexure` function can be altered and duplicated to allow a binding of textures to an array although I have yet to understand how to apply this information to my models within the project. This secondary texture proves to be my challenge regarding this enhancement.