**CS 330 – Final Project Reflection**

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1. **Justify development choices for your 3D scene.**

I decided to create a 3D rendering of Michigan Stadium, located in Ann Arbor, Michigan and home of the Michigan Wolverines football team. Rendering the stadium was difficult as it is a large scale rendition of the stadium. The stadium’s seating was the most difficult to accomplish especially the corners of the stadium to give it a rounded look, like all stadiums have. I tried multiple different shapes and sizes, including a torus (which ended up looking stretched out and I could not get it angled downward). I then tried using a cylinder and tapered cylinder by flattening them and trying to angle them downward, but these two didn’t look right (couldn’t get the angle of a flat cylinder or tapered cylinder correct). So, in the end a decided on making identical boxes, moved slightly forward to make it look like staggered stadium seating, and was able to angle the corners (with much trial and error) to line them up with the straight sides of the stands.

I also at first had the east and west press boxes as one solid box, but decided to break it up into three levels as the press boxes at Michigan Stadium are tiered that way. Also the color which are a metal material of the press box and scoreboards were recently refinished and are a more rich blue, the stands meanwhile are worn out at the stadium because of the foot traffic of over 110,000 people over the course of over a hundred years. So, I made them look more dull and worn out by using a different shade of blue to showcase this. As working through the milestones, I had been making adjustments to a singular scoreboard. For the project I duplicated it and put it on the other side and shortened both of them as the pillars hardly show up when you are in the stadium. Lastly, I used an ambient light source to simulate sunlight reflecting of the stadium surfaces.

1. **Explain how a user can navigate your 3D scene.**

The user can navigate the scene with the arrow keys, W = FORWARD, A = LEFT, D = RIGHT, S = BACKWARDS, Q = UP, and E = DOWN. You can also use the mouse to look around and turn yourself around to view the stadium from different aspects look at every part of the stadium from every angle.

1. **Explain the custom functions in your program that you are using to make your code more modular and organized.**

I used a lot of copy and paste while I was writing the code, I would get one section right and since the other side of the stadium is identical, I would move it to the other side. The only difference is I would change the rotation to a positive or negative number, or the X, Y, and Z coordinate becoming an opposite number. Using this method is definitely time-consuming and involves a lot of trial and error, but in the end I was able to line everything up how I wanted them and made them look more realistic.