Carlos Lopez Rodriguez
ES-18
Midterm Project

Bacteriophage Lamp

In this project I was able to show all the of the AutoCAD skills I have learned in this class, from 3D modeling, to 2D drawings, to 2D paper space outputs of the models.

I designed my lamp to look like a bacteriophage (Figure 1A). I also got inspiration from a post on Facebook on Memorial Day about the Anthems Veterans Memorial in Anthem, AZ (Figure 1B). The memorial has five blocks of rectangular pillars, and on November 11th at 11:11, the sun is at the exact position and the five oval openings in the pillars make the seal of the United States.

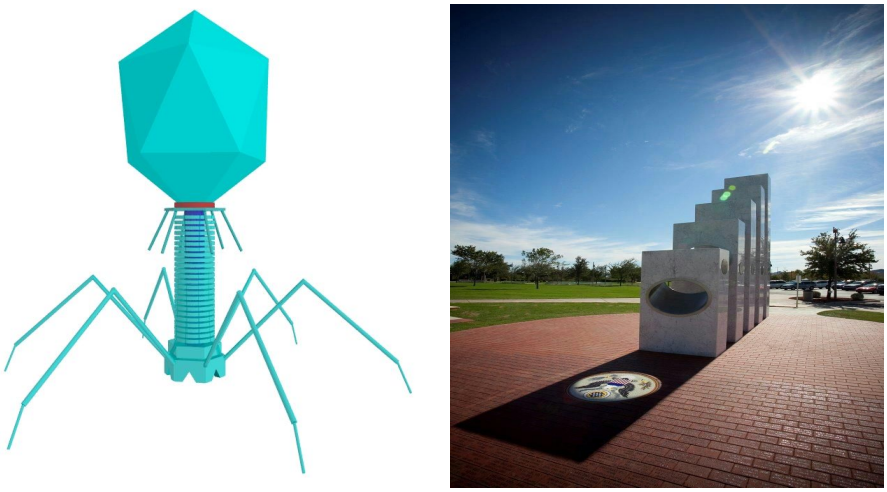

Figure 1. (A) Bacteriophage. (B) Anthem Veterans Memorial (Anthem, AZ).

In my lamp I modeled the circular layers of the bacteriophage. In each layer I put one letter of my name and an extra abstract design. I added an extra layer with two lines that would border the top and bottom of my name, totaling 7 layers. This is much fewer layers than the bacteriophage but more than the 5 pillars of the memorial.

The outer circle of each layer was created using a sweep. A 0.5” square was created as the base and an 8” diameter circle was created was the path. Inside of each layer, I created another sweep for the letter and abstract design. The design was created using a polyline, and the base was a 0.2” square. These layers were stacked on top of each other, with some separation between them on top of the lamp.

The layers were supported with four cylindrical pillars. One cylinder was created using the 3D basic geometry, and the circular array tool was used to make a polar array of four items.

The base of the lamp was created using a circular sweep, two perpendicular cylinders, and a pyramid. The circular sweep consisted of a circle base of 1” diameter and a circle path of 8” diameter. The pyramid was placed on the perpendicular cylinders of the base, with the vertices lying on the axes of the cylinders. The light bulb was placed in the middle of the pyramid, with the base of the light bulb at the center base of the pyramid. The subtract tool was used to make a perfect screw hole for the light bulb, then the light bulb was placed there.

The legs of the lamp were made using the loft tool. Three circles were created to indicate the cross sections of the loft, which the tool used to interpolate the shape. The array tool was used to make a polar array of four items around the lamp base. These legs model the legs of the bacteriophage.

My lamp was innovative in combining the physique of a bacteriophage with the optical ingenuity of the Anthem Veterans Memorial. Each layer of my lamp, was part of a puzzle that would reveal the ultimate design of my name when shone by the light bulb at the base.

Several challenges I faced were moving around objects exactly where I wanted them to be. Specifically, moving around each layer to be exactly in their location was difficult. It was often difficult manipulating AutoCAD to move in the direction you wanted to move. It was also challenging creating 3D shapes out of 2D drawings, because you have to rotate objects and place them exactly in positions. With my layers design, I found it challenging to have exceptionally clean dimensioning drawings. Because each layers had an abstract polyline, I had to dimension many lengths, positions, and angles, which were often crowded near each other. Additionally, the abstract design of each layer was inside the overall geometry. This meant that placing the dimensions inside of the geometry resulted in the clearest dimension drawings.

I enjoyed the project, because we got the freedom to create a unique lamp using the skills we have learned so far. It also gave us the opportunity to run into problems we had not ran into, which helped us learn more AutoCAD skills. I believe every future class should be given a midterm project, because it is the first assignment where they have freedom in. This will prepare them for future assignments and the final project.