UNITED STATES MILITARY ACADEMY

PROJECT #2: 3D MODELING WITH TRANSFORMATIONS

CS473: COMPUTER GRAPHICS

SECTION C1

CPT BRIAN BOYLES

By

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WEST POINT, NEW YORK

6 APRIL 2017

\_\_\_\_\_ MY DOCUMENTATION IDENTIFIES ALL SOURCES USED AND ASSISTANCE

RECEIVED IN COMPLETING THIS ASSIGNMENT.

\_\_\_\_\_ I DID NOT USE ANY SOURCES OR ASSISTANCE REQUIRING

DOCUMENTATION IN COMPLETING THIS ASSIGNMENT.

SIGNATURE:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The application I have designed is a program to view the 3D model I created using Blender. The model is supposed to resemble an armored car since I could not think of a way of animating tank treads. The automatic animation is of the wheels spinning, although it is hard to see since they are solid colors. The animation controlled by the user is the turret orientation. I have instructions for using the application printed in the upper corners of the screen.

All of the controls for using the application are printed in the upper corners of the screen. The user can use the R key to reset the camera. The right mouse button can be held to allow the mouse movement to pan the camera, and holding the middle mouse button allows mouse movement to control the camera zoom. The W, A, S, and D keys can also pan the camera. The left and right arrow keys control the car’s turret. The F key toggles the camera mode between free and locked. When in free camera mode, the W, A, S, D, Q, and Z keys control the camera’s position, while all other controls remain the same.

I initially wanted to create a model of a tank for this application. However, after getting a very basic hull built I attempted to animate a part of the object. I found that it would be very difficult to animate the tracks of the tank, which I was planning on making the automatic animation. Instead of picking a different automatic animation, I chose to make a model of an armored car because I thought animating spinning wheels would be easier. I started the hull of the car using an image from the internet, but did not strive to recreate it exactly. After getting the basic shape down I started adding features to the body to make it look more developed. I then added wheels and the turret, which I created without any image to replicate. I tried putting spokes into the wheel to make it easier to see that they are spinning in the application, but the wheels turned out to display as solid cylinders anyway. After getting the model into the application, I went back to Blender to add colors to the distinct pieces of the car so they would be more visible. I then added the instructions to the upper corners of the screen. Since I had little working code from project 1, I chose not to implement any of the GUI items from it. I could have used a button to toggle the camera mode, but I had already set it to a key and did not have enough time to get the button working for this project. I also decided that having the text directly on the background looked better than drawing a box in the corner, after having some difficulty getting the text to draw over the box.

During this project I learned how to user Blender and import blender objects using openGL. I think I did well at creating the object in Blender, although the object does not show up as well in the application. I think I also did well in coding the application; I did not get stuck trying to figure out how to do anything and was able to implement all the features that I wanted to, given the time that I had.