Project Description

This project is an attempt at modeling the featured motorcycle from the 1998 Japanese animated science fiction film, Akira (Figure 1). The motorcycle is ridden by gang leader Shotaro Kaneda. His customized motorcycle is instantly recognized by Japanese animation fans and is one of the most iconic symbols of that era of Japanese animation.

Figure 1. Promotional movie poster for Akira.

As shown in Figure 2, the user is initially presented with a command list window and is also asked whether a full-screen or windowed version should be used. If the user's video card is able to support the full screen version or the user selects 'No', a new window opens displaying the motorcycle in the default position. The user is able to rotate the motorcycle about all axes, zoom in and out, and toggle between a wireframe and solid polygon structure, as show in Figures 3, 4, 5, 6, and 7.

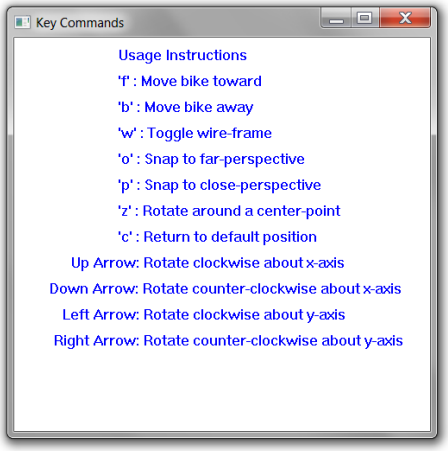

Figure 2. Application command menu.

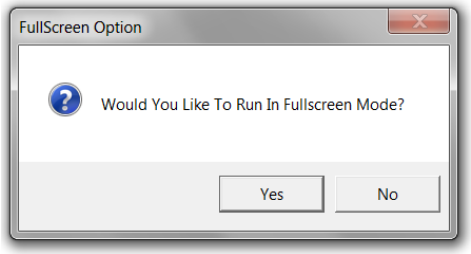

Figure 3. Prompting user for full screen option.

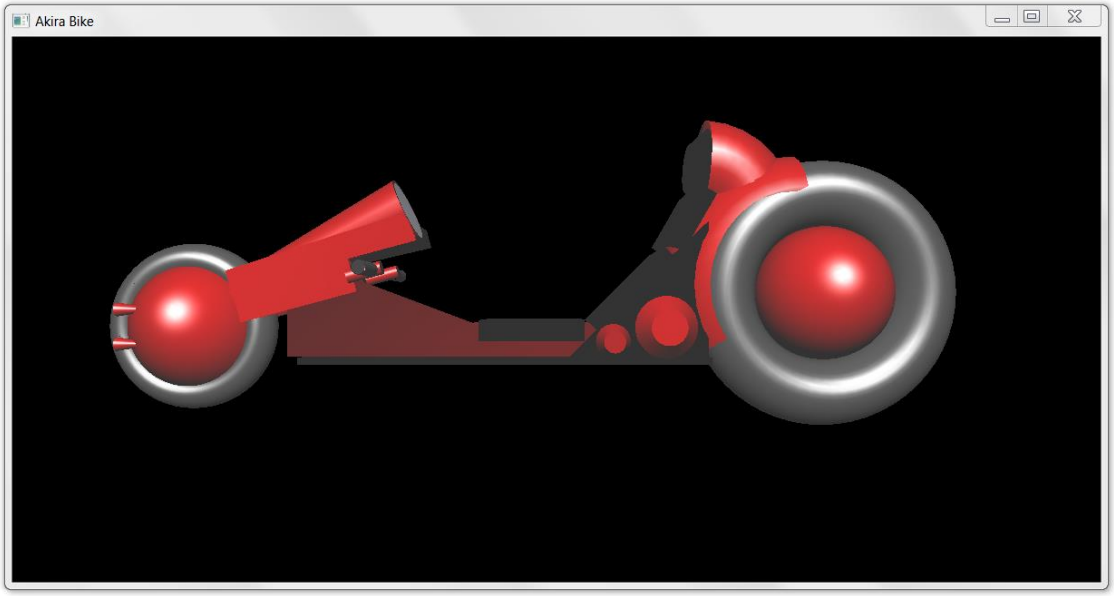

Figure 4. Application main display with model in default position.

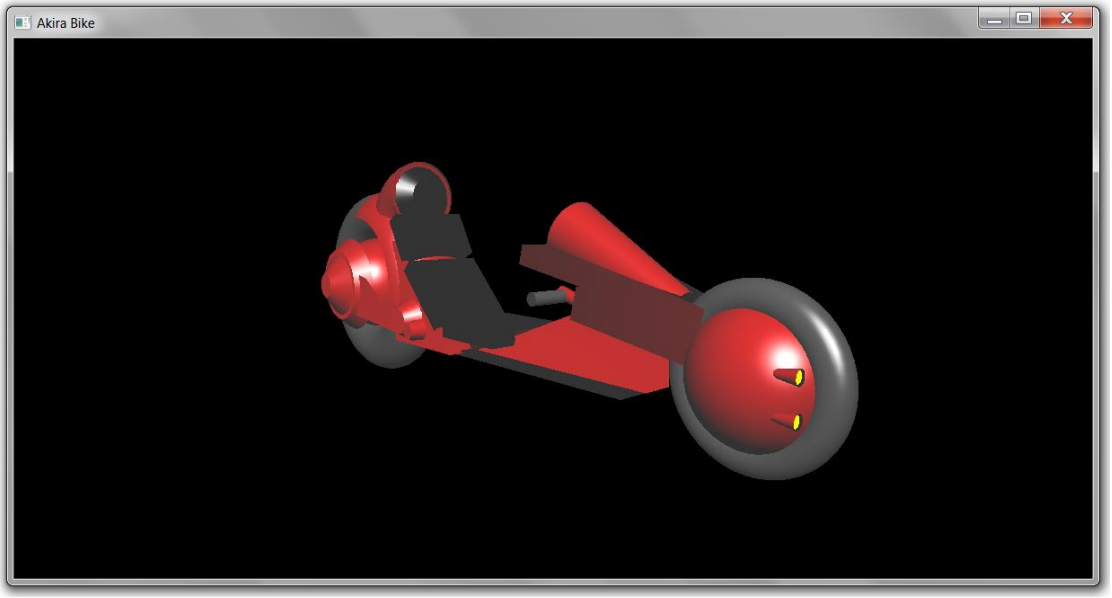

Figure 5. Model pushed back and rotated about the x and y-axis.

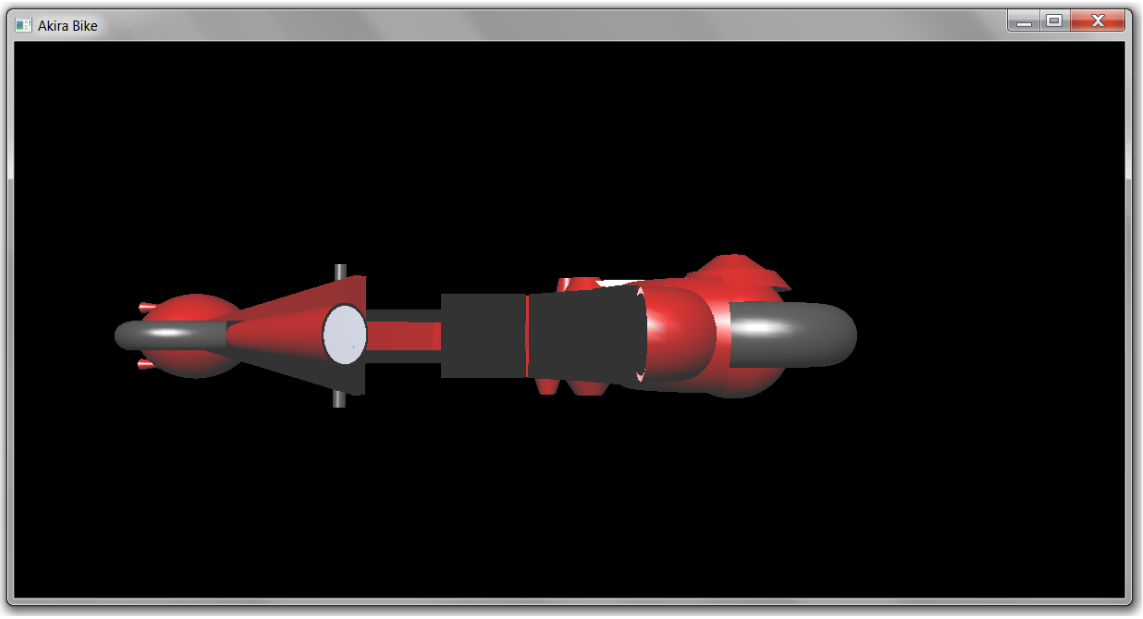

Figure 6. Top view of model.

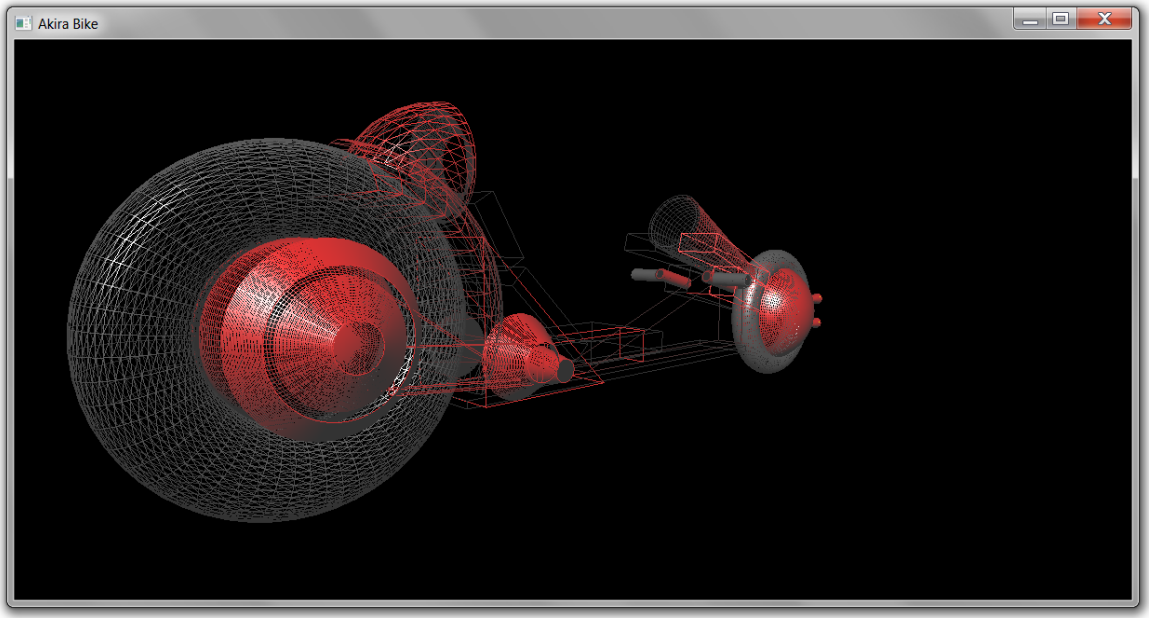

Figure 7. Right-rear side wireframe view

Selection Decision

I've wanted to build a real-life variant of this motorcycle ever since I saw this movie many years ago. However, over time, this little dream of mine had been overshadowed by accumulating time and financial constraints. At least with this project, I can realize some aspect of that dream. Maybe one day I can hook this design up to a 3D printer and ride off into the sunset. The only things its missing is an engine.

This project was also selected because I knew it would be extremely challenging and educational. For an additional challenge, I elected to use the Win32 windowing system with a good amount of error handling.

Incorporation of Project Requirements

Geometric Transformations

Geometric transformations are utilized extensively throughout the application, as many of the polygons, conic sections, and circles are incorporated together in different sizes, scalings, and rotations to create the desired shapes. For example, the drivetrain cover over the right side of the rear wheel consists of stacked conic sections with varying heights and base and top dimensions.

Animation

The user has the freedom to animate the motorcycle into any position desired using the keyboard characters indicated in the command menu.

Menu System

The menu consists of a simple window that displays the command list using the `textOut` function.

Lighting Effect

I elected to use a lighting position that was above toward the right and in the positive z-direction. I also used emissive lighting for the headlights.

Future Enhancements

There are hundreds of details that could have been included in the application. This is instantly evident when viewing the bike in wireframe mode. There is no engine, drivetrain, suspension, or electrical components. Unfortunately, I had to exclude these details due to time limitations.

Known Issues

There is a windowing error which I was unable to resolve in a timely manner. A second main window is produced in the background. When closing the application, the "Could not unregister class" error message appears. This does not interfere with program functionality.

References

IMDb. (n.d.). Akira. [Online image of Akira DVD cover]. Retrieved from http://www.imdb.com/title/tt0094625/