Hugh Coleman - 04/06/2024 - Graphics HW3 - SP24 - Prof. Hibbs

My model is a Mobius strip.

I then implemented a series of lines / snakes that follow the path of the strip. This was honestly really difficult at first, and required a lot of math to calculate points on the Mobius strip.

My main breakthrough was when I realized that I could use multiple points on the strip at different “times” along the strip to construct a line that followed the strip. My function to compute points on the strip was able to compute a “time” on the strip, how far from the surface of the strip, and how “wide” along the strip, allowing me to make a lot of interesting things.

Please see some of my videos on the GitHub / in the archive.
Especially “SpecularLighting”

I started this by having balls run along the surface of the strip. It was a very fun project and I actually began to enjoy it a lot once I had got the glass ball functionality complete

I approached the glassball interface by stacking transformations.
I would take the user mouse vector, rotate back my vertical and horizontal vectors, then rotate the model. These were all rotated around an axis that I calculated using the out screen and mouseVectors.

First I had approached this trying to rotate the camera. Then I went to your office hours a few times, and now I feel that I understand how the different spaces work in 3d graphics a LOT better.

I implemented extensions

- rotate
- per vertex normals

For rotation, I figured that it was simply rotating around the outscreen axis. This was actually quite easy once I had done the rest of the dragging.

For per vertex normals, I calculated the normals on my Mobius strip. This was hard, but made for satisfying results when I flew lights across it.
“lightingLoop.gif”, “specularLighting.gif”, “loop.gif”

In my final example, it doesn’t really display colors, but it does have a nice lighting effect and is better than when I turn off using the normals (toggled by a key).
I hope this is visible enough. If not, partial credit for my previous version with the flying colored lights would be greatly appreciated.