

Swept Surface Editor

For my final project, I want to create a program that allows the user to create swept surfaces. Swept surfaces are 3D object based around two curves; one in the form of a polygon and the other, a trajectory curve, defines how that polygon will create a surface through space. For a simple example, the user could create a square polygon with a second curve that will create a bump in the center, or a circular polygon with a second curve that will create a wavy tube.

The user will go about creating these curves by clicking anywhere on the drawing surface. The more they click, the more vertices are added to the polygon. Once the user completes the polygon, they will be prompted to create a trajectory curve. Once they have completed these two steps, they will have a swept surface. There will also be easily scaleable preset shapes that the user can create such as circles and rectangles. There will be a tray to the side of the window that shows all the objects you have created and how you can manipulate them. The user can scale, translate, and rotate the object as well as change its color. I will try to mimic a photoshop style user interface in this regard.

The timeline for this project will go as follows:

5/17: Prototype Swept Surface Creation - Just lets the user click out a polygon and a trajectory curve.

5/21: Camera Control - Lets the user move the camera around using the arrow keys.

5/23: Basic User Interface - UI Trays that contain the surfaces you have created, as well as unimplemented buttons for features.

5/28: Coloring and Lighting Surface - The user can specify a color for the surface as well as change the lighting color.

5/31: Translating Surface through Space - Moves the surface as a whole through space.

6/4 : Rotating and Scaling the Surface - Rotates and Scales the surface as a whole.

6/7 : Polish Features - Smooth out any bugs present in the program.

Stretch Goal: Free Form Polygon Drawing

As a stretch goal if I meet my other requirements early, I would like to have a free draw option in which the user is given a brush to draw out a line. Using some unspecified algorithm, the program will create a polygon based on that drawing.