

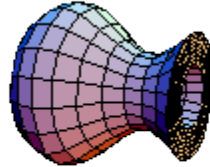
# CS 3370 – Computer Graphics

Fall 2009

Lab # 3

Due electronically before 11:59 p.m., October 20, 2009

The goal of this lab is to gain experience with 3D transformations and solids of revolution. A solid of revolution is a solid figure obtained by rotating a plane curve around some straight line (the axis) that lies on the same plane. An example is shown below.



Write a program that prompts the user to input the vertices of a solid of revolution using the mouse and the number of steps in the revolution, and builds a solid of revolution using that data. After building the solid, your program should run a loop, redrawing the object every time its configuration changes. Using the keyboard and/or mouse, allow the user to perform the following operations:

- Rotate the solid about any of the three main axes, using an object-centered reference frame (with the object's centroid as origin) and a reference frame that is parallel to the world frame and has the object's centroid as origin.
- Translate the solid along any of the three main axes, using both world-centered and object-centered reference frames.
- Scale the solid along its main axis or uniformly perpendicularly to that axis (so that it remains a solid of revolution). In both cases use the object's centroid as the origin.
- Toggle between position mode and velocity mode for all commands.
- Toggle between world and object coordinates for translation and rotation commands.

For extra credit consider adding more functionality to your program. For example, try shading your solid using OpenGL built-in functions.

## Deliverables

1. A report following the guidelines stated in the syllabus.
2. Your program source code.