CS 411: Lab 03

1751037 - Quang-Thuc Nguyen

June 6, 2020

1 Drawing 3D Object

1.1 3D Rotation Object

I defined that a 3D object, which can be created by rotate 2D object around an axis, is rotation object. In this project, rotation object includes sphere, cone, cylinder, hyperboloid, paraboloid, disk, torus.

Pipeline. Firstly, with each type, I created a 2D object which is used for rotation. With some shapes having curve, I used multiple lines to estimate the curve. Secondly, I rotated the lines around the 2D shape around the axis by defined sector until complete a circle. At each sector, I create a quad surface by connecting the previous line with the current line. Due to the 2D object is estimated by n_l lines and 3D object is created by n_s sector rotation of 2D object, the texture divided into grid $n_l * n_s$. The quad-surface is created by i-th line and j-th sector will be mapped with the cell(i, j) in the texture.

1.2 3D Flat Object

With object that is created by multiple flat surfaces, I drawn each surface and mapped the whole texture for each surface.

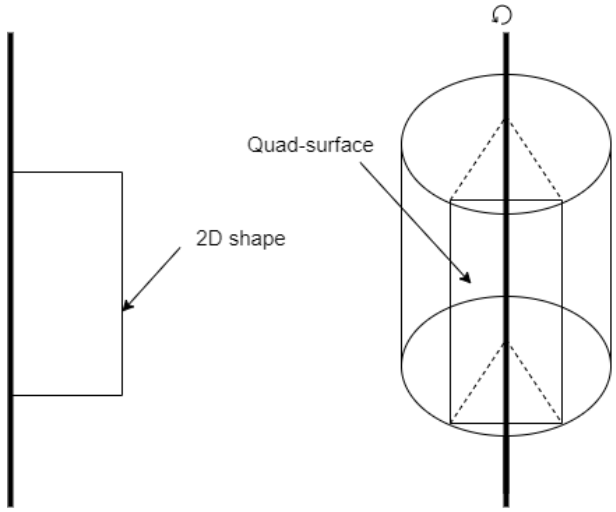

Figure 1: Pipeline of drawing cylinder

2 Object Rotation

To rotate an object, I used `glRotatef(angle, 0, 1, 0)`. Moreover, making the visualization of cylinder and the torus more clearly, I rotate the object 35 degrees in x-axis.

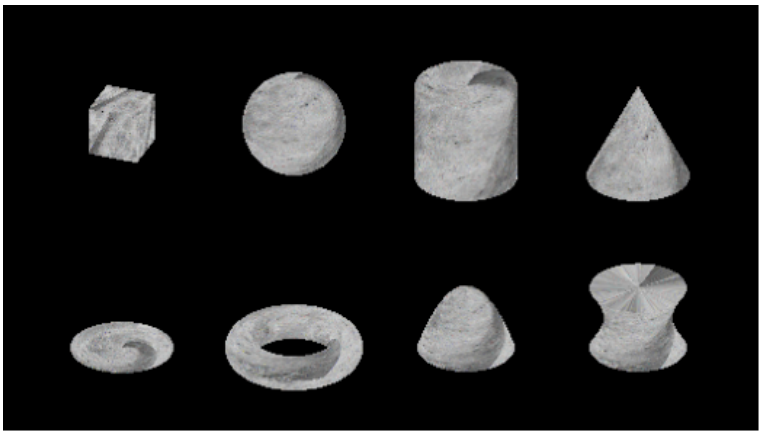

Figure 2: 3D object visualization