Project 3: 3D Object drawing

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February 10, 2022

Computer Graphics 4810

CRN: 52483

The goal of this project was to make a program that can convert 3d coordinates to a 2d screen. The program also needed to be able to use the transformations of translate, scale, and rotate around the x, y, z axis.

**Basic 3d image on a 2d screen:**

The Basic use of the program requires the input of the viewing coordinates (x, y ,z ), For this example, our viewing coordinate is (6 ,8 ,7.5). Without any transformations, our program outputs this image from the 3d coordinates around the origin be -1 and 1.

Shape

Description automatically generated

**Scale:**

For the scale function of the program, we need to input the amount that the object needs to grow by using floats. We can change the size of the object in the x, y, and z directions to either lengthen or shorten them.

For example: We grow this object by (2, 0.5, 1)

Diagram, engineering drawing

Description automatically generated

**Translate:**

The translate function moves the object in the x, y, and z directions in the 3d space. This allows for repositioning of objects in the 3d space. Moving an object further away from the viewpoint makes the object smaller and vise versa.

For example: We move this object by (-5, -5, -5)

Shape

Description automatically generated

**Rotate:**

Shape, radar chart

Description automatically generatedThe rotate function rotates the object around a give axis. From the method’s name rotateX rotates around the X-axis, rotateY rotates around the Y-axis, and rotateZ rotates around the Z-axis.

For example: rotateX(10)

Shape

Description automatically generated

For example: rotateY(10)

Shape

Description automatically generatedFor example: rotateZ(10)

**Conclusion:**

Using all these functions we can implement a 3d space where we can recreate objects while repositioning them and viewing them from different viewpoints. This is the building blocks to Virtual Reality and all its relevant subfields.