

Assignment 1

CMSC 427, Spring 2009

Due 11:00am, Tuesday, February 24, 2009

Maximum Score: 10 points

This assignment involves setting up OpenGL, texture mapping, procedurally defined models and animation.

Compiling the Startup Code

In order to compile `texture.cpp`, you will need to set up the following include files:

```
#include <GL/glut.h> //openGL utility toolkit
#include <GL/gl.h>
#include <GL/glu.h>
#include <stdio.h> //for reading from file
#include <math.h> //for trig functions
```

Visual Studio users can follow the instructions at <http://www.cs.csustan.edu/~rsc/CS3600F01/InstallOpenGL.html>

In addition, Windows users will need

```
#include <windows.h> // make sure that <windows.h> comes before <glut.h>
```

Linux users can compile using `gcc -g -o texture texture.cpp -lGL -lGLU -lglut` after adding following includes:

```
#include <stdlib.h>
#include <unistd.h>
```

You will also need to have the associated `.lib` files and `.dll` files for GLUT in a place where your compiler can find them.

Assignment Tasks

Get the program compiled and showing the quilt texture on a square facing the camera before making modifications to `texture.cpp`.

1. The quilt is currently mapped onto a single large quad. Replace this quad by a grid of smaller quads that cover the same area. The output after this step should look just the same: one large square facing the camera. To do this, you will need to review your notes about texture mapping coordinates. **(2.5 points)**
2. Modify the coordinates of the small quads so that the quilt has ripples or waves. (You will need to use a trigonometric function for this.) **(2.5 points)**
3. Animate the ripples, so that the quilt waves over time. **(2.5 points)**
4. Rotate the quilt in various directions so that the user can see it from all different sides. **(2.5 points)**

Most of your changes will be made in the “display” function, which is run again and again in a loop. But you will probably need to add some global variables that maintain their state between runs of this function. (If you feel global variables are inelegant, feel free to do it another way.)

Submit your final `texture.cpp` file (well commented, please, including your name at the top) electronically.

You can discuss this assignment with others but all the code that you turn in must be your own and not based on anyone else’s work.