

**CMSI 671**  
**COMPUTER GRAPHICS (GRADUATE LEVEL)**  
Spring 2007

### **Assignment 0130**

This assignment continues the process of getting to know the OpenGL API by adding more functionality to your *fiveshapes* program.

#### **Not for Submission**

1. Background and reference reading for this assignment can be found in Angel Chapters 2 and 3.
2. On the API side, red book Chapters 3, 4, and 5 will contain the programming information that you're most likely to use/need.

#### **For Submission**

##### **What to Do**

Add the following features to your *fiveshapes* program. Note how some of these features were extra credit assignments from last week; good for you if you've added them already:

- Convert all of your shapes into genuine 3D objects *that do not use* the prefabricated GLUT convenience functions.
- Implement lighting and shading.
- Change the control that starts/stops spinning the displayed shape from a mouse click to a press of the space bar.
- Have a press of the "V" key toggle between orthographic and frustum/perspective viewing volumes for your shapes.
- Have a press-and-drag of the left mouse button rotate or move around the shape in 3D.
- Have a press-and-drag of the right mouse button scale the shape up or down.

Make sure to follow the MVC paradigm when implementing these new features and controls.

##### **How to Turn it In**

1. Since this is essentially a "new and improved" version of *fiveshapes*, commit your changes "in place," under */homework/cmsi671/fiveshapes*.
2. Tag the submission as *hw-0130*.

##### **Extra Credit**

You will get extra credit if your *fiveshapes* program includes performs texture mapping on your shapes. If you derive your textures from external image files, make sure to commit those along with the source code.