

## **Homework 4: Shaders and Models in XNA**

**Due Wednesday, November 21, 2007 at 11:59pm**

This homework is short and to the point, since after all you are supposed to be working on your game. It is designed so that after you have finished it you should be able to re-use your code for your final game project. This homework should be done individually (not as a group). Please document if you receive help from others or from the web.

### **1. Model viewer (5 pts)**

Set up a demo application in XNA which allows you to look around a model and move the light source in a controllable way. You can use any inputs you want (keyboard, mouse, or game pad). Shade the model with the “standard” lighting model. This viewer does not have to be as complex as the one you did for homework 2. You just have to build something that allows you to manipulate your objects effectively.

### **2. Applying a shader to a model in XNA (5 pts)**

Write a checkerboard shader like the one I wrote in class in whatever shading language you choose (e.g. HLSL) and apply it to your model. Your model should now look like it is made up of a checkerboard material.

### **3. Applying a glossy map to the model (15 pts)**

Create a black-and-white texture which specifies in white the regions that are glossy/specular and in black the regions that are diffuse. Write a shader that will illuminate those parts of the object appropriately. The result will be a model that will look shiny in some places, diffuse in others.

### **4. Bumpmapping (15 pts)**

Create a normal displacement texture and use it along with an appropriate surface shader to create the appearance of a bumpy surface. You should be able to move the light source and see the illumination on the bumps vary.

### **5. Extra credit (10 pts)**

Write a procedural shader using Perlin noise to create the appearance of a marble surface.

### **Submission**

Call each of the projects a separate name (hw4\_part1, hw4\_part2, etc). Zip up them up and put your name on the zip file.