

CSC 476 – Lab 3 – Due 6/12/07

Normal mapping using a shader

Please note that this lab should be completed **individually!** You may talk to one another about the lab, but you may not look at someone's working code!

Implement an OpenGL program which includes a pixel shader to view and rotate a normal mapped model. Please write a program to read in the normal mapped tyra mesh, which can be found, linked on the class webpage. This file was generated using Nvidia's Melody tool. It includes a .obj file of the low resolution tyra model, including the vertex position, the vertex normal, the tangent and binormal vectors for that vertex and the vertex texture coordinates. The vertex texture coordinates should be used with the associated .bmp file which is the normal map produced for the tyra model.

You may use resources/tutorials to help you read in the .obj file and the .bmp file (you should also have resources at this point). You must write your own shader (for example using Cg or GLSL). Make sure that you understand how the pixel shader is working. **DO NOT CUT and PASTE** normal mapping tutorial code. You may look at tutorials to help you understand pixel shaders, but you must write your own shader to render the normal map!!!! Please use either Cg or GLSL to write your shader.

In addition to reading in and displaying the normal mapped mesh, your program must allow for:

- rotating the mesh around to view all sides
- toggling the rendering between pixel shaded and flat shaded.

Learning Objectives

- Learn to about **pixel shaders**
- Learn about **the power of normal mapping**

• Grading and Due Date

You must **demo your program in lab on June 12, 2007.**

Note that if you prefer to not use the tyra data provided, you are free to create the normal map from any model. You may look into creating the normal maps from a high res and low res mesh. Both Nvidia and ATI has normal map creater tools. Nvidia's tool can be found at:

http://developer.nvidia.com/object/melody_home.html

Or ATI's tool can be found at:

<http://ati.amd.com/developer/tools.html>

(click on normal mapper)