

Spring 2006
22C:196 Advanced OpenGL Rendering
Assignment 2

Due: Thursday, March 2nd at 11:59pm

Goal: Use the stencil and depth buffers to draw models using various line types. Enable OpenGL fog, and allow the user to select and move around various objects simply by clicking on them.

Problem 1 (25 points): Create an OpenGL/GLUT program that loads the models provided on the web (Al Capone, soccer ball, and F-16) and draws all three of them plus a `glutSolidTeapot()` onscreen at the same time. Again, put a textured ground plane in the scene. For each of the four complex models, the user should be able to selectively draw them in one of five modes:

1. Standard OpenGL lighting
2. Standard wireframe mode
3. Without hidden lines, drawn using a depth test and polygon offset
4. Wireframe mode where frontmost lines have “halos”
5. Standard OpenGL lighting with silhouette edges

Make sure the silhouette lines contrast with your selected material type, do *not* use immediate mode rendering (however you may choose display lists and/or vertex arrays), and allow the user to change modes either using a menu or well-documented key strokes. Allow the user to change the parameters for each object independently!

Problem 2 (10 points): Enable OpenGL fog so that objects further from the eye fade into the background color. Set the parameters so that the object furthest from the eye appears significantly dimmer, yet still clearly visible.

Problem 3 (15 points): Use OpenGL’s picking/selection mechanism to allow the user to click on an object and drag it around the screen until the mouse button is released. How this motion works is up to you, but I would suggest you keep the object’s *z*-value (depth) constant and allow the user only to move the object in its original *xy*-plane. Please scale this motion so that the object remains under the mouse cursor during motion.

NOTE: Please include a README file describing the platform your program runs on as well how to compile your program. If you do not include all the models with your submission, tell me where the models must be for your program to find them.

NOTE: Post images from this assignment on your web page. Send me a link to your web page, if you have not already done so!