

University of Colorado
Department of Computer Science
Computer Graphics – CSCI 4229
Spring 2003
Problem Set 12

Issued: 18 April 2003

Due: code part 25 April 2003; written part 29 April 2003

Reading: Angel, chapter 7.

Problems:

This problem set is the penultimate step toward the videogame that you will write as the last homework project.

1. Remove everything but the cylinder and the teapot from `shaded3Dscene.cxx` so you can better see what's going on. Turn Gouraud shading on and off, and describe its effects on the cylinder. Change the number of `slices` and `stacks` in the cylinder and see how well Gouraud shading makes up for the discretization. Turn in your explanation in writing on 29 April.

2. Use `ppmdisplay.c`—which came with the textbook and is also available in the official CSCI4229 tarball that you downloaded during the first in-class exercise—to read some interesting image in to memory and display it. The unix tool `xv` will convert images to/from ppm and other formats like jpg and gif, so you need not confine yourself to the `robot.ppm` file that came with the text. If you have format troubles, you might want to download a new version from the webpage; some versions of `xv` seem to save things out differently, so I had to comment out one of the error checks to get things to work on some images.

3. Combining the operative chunk of `ppmdisplay.c` with your PS12 code, display your image from problem 2 above as a poster on one of the walls of your room.

4. Dig through `cubetex.c` (which also came with the textbook and is in the tarball) and make sure you understand:

- how the texture map is defined, and
- how it gets “stuck” to the faces of the cube

Change the definition of the texture map to some other interesting pattern (e.g., an irregular checkerboard, a fractal, ...) and display the rotating cube with the new pattern on all six faces.

5. Reverting back to the original checkerboard, change the mapping so that different parts of that texture map are applied to different sides of the cube. Figures 7.25 and 7.26 of the textbook will give you some ideas on how to start.

Please email a gzipped tarball containing the source code for problems 3-5, together with your Makefile, to `csci4229@cs.colorado.edu` before 5pm on 25 April. Call this file `ps12problemn.c` (or `.cxx`). As always, your code must both compile—**using the Makefile in your tarball**—and run on the CSEL machines.