Computer Graphics Labs

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LAB. 7

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EVENTS, MENUS, TEXT AND MOVING AROUND

1. Learning goals
2. Interesting links
3. Programming exercises

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EVENTS, MENUS, TEXT, and MOVING AROUND

In this lab we intend to learn how to better control events within graphics applications, as well as to introduce menus and graphics text.

1.   Learning Goals

At the end of this chapter **you should be able to**:

1. To build up 3D scenes with a better control of mouse and keyboard events.

2. To use menus in graphics applications.

3. To use plain text and 3D text in graphics applications.

4. To move around a 3D scene using a synthetic camera.

2.   Interesting links

Before proceeding any further, have a look at the following web links to be aware of the 3D in OpenGL:

http://www.lighthouse3d.com/

http://www.lighthouse3d.com/2011/04/glut-tutorial-some-bugs-have-been-eliminated/

The latter link is particularly useful for this lab.

3.   Programming Exercises

1. Change the program `mouse.c` in order to replace a 2D scene by a 3D scene (e.g., the CUBE world provided in last class). Use the keys 'i' and 'o' to perform the zoom-in and zoom-out operations. Moving the viewer forwards and backwards in the scene can do these zooming operations.
    HINT 1: The updated position of the viewer must be displayed on screen using the primitives in `menu.c` to display text.
    HINT 2: The zooming facilities can be inspired in the program bunny.zip that can be downloaded from the course web page. Alternatively, you can use camera.zip.
2. Rotate the CUBE world around the normal vector at its center. The rotation angle must be choosen from 4 possibilities (e.g., 10, 20, 30 and 45 degrees) listed in a pop-up menu that is activated by pressing the right button of the mouse.
    HINT 1: See `menu.c` for more details.

HINT 2: Have also a look at:
http://www.lighthouse3d.com/tutorials/glut-tutorial/popup-menus/

3. Let us assume that the CUBE world is a preliminary project of a city, where each cube refers to a different building. Let us write the door number on a face of each cube.
HINT: Have also a look at:
http://www.lighthouse3d.com/tutorials/glut-tutorial/stroke-fonts/

4. Place the viewer on the plane of the CUBE world. Now, assuming you are the viewer, let us walk on the streets of the CUBE world. The arrow keys control the movement of the viewer.
HINT 1: Use the program camera-in-C.zip as an inspiration to program the movement of the viewer as a synthetic camera.
HINT 2: Have also a look at:
http://www.lighthouse3d.com/tutorials/glut-tutorial/keyboard-example-moving-around-the-world/