Lab #3: C++/Irrlicht Lab

Due: May 5, 2010 (demonstrate in lab)

Overview

For this lab you will implement a program that

- reads a file that contains information describing a graph.
- contructs an internal representation of the graph.
- "draws" the graph using Irrlicht.
- loads the Quake3 map (as done in the tutorials).
- allows the user to move through the map while highlighting the nodes and the edges of the graph based on proximity.

1 Reading

Your program will read the graph information from a file. The file begins with an integer specifying the number of nodes in the graph. The coordinates for each node follow (one per line). Each node is defined by an integer label and x-, y-, and z-coordinates (floating point values). The file then lists the edges between nodes as a pair of integer labels (each line denotes a single edge).

For example, the following describes four nodes with three edges.

```
4
1 2.0 3.0 4.0
2 2.0 3.0 8.0
3 5.0 2.0 1.0
4 9.2 7.8 4.1
1 2
1 3
4 3
```

2 Displaying

Display the graph using Irrlicht. You may render each node as a sphere using `ISceneManager::addSphereSceneNode` and each edge using `IVideoDriver::draw3DLine` (you can change the thickness with, at least, the openGL driver). You may, of course, display the graph in a different manner as long as the nodes and edges are obvious.

3 Highlighting

Allow the user to move through the scene with a FPS camera. As the camera moves, "highlight" the nearest node and the edges touching that node (this can be done with a color change, for example).