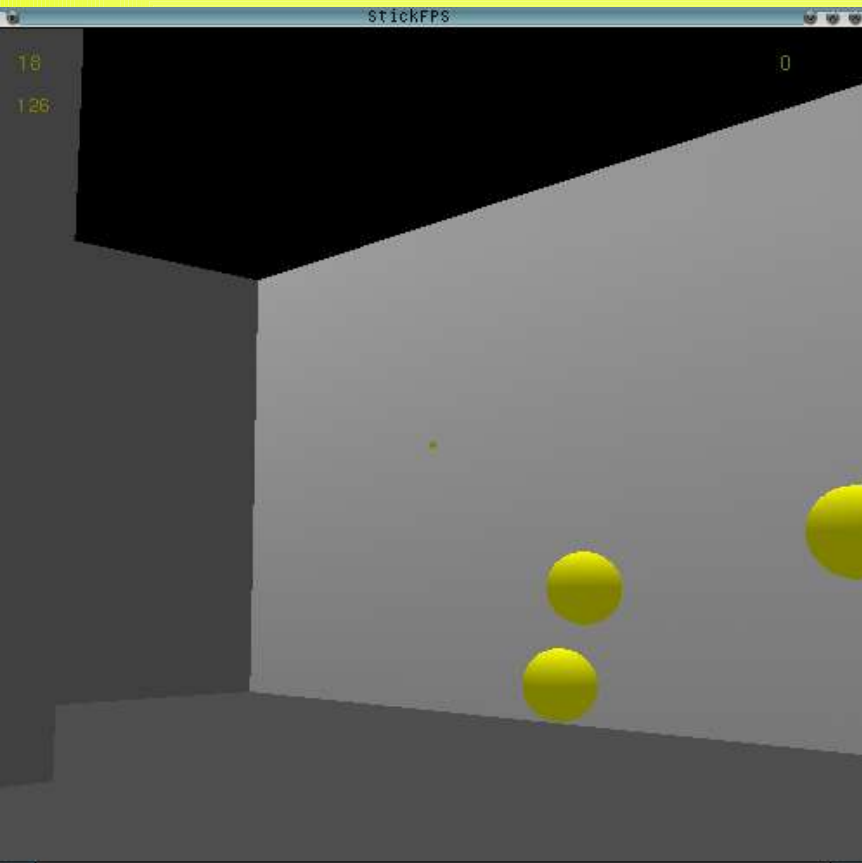


Creating a 3D Game With Textures and Lighting.

Computer Systems Research *John Fitzsimmons 2004-2005*

Purpose: To create a first person shooter in 3D using OpenGL and the C++ programming language.



Research is carried out over the internet at opengl.org and other C++ resource sites. I acquire new functions I need to program my game. The program consists of using models, textures, lighting, and polygons to create a 3D world in OpenGL. Various equations are used to calculate camera angles, movement, and physics.

Many commands are needed in OpenGL to create this program. For example, to move the camera, “eye movements” are controlled by `glLookAt`, which takes an eye position with one point (x ,y, z) and 2 vectors. One vectors is the up direction and the other is the forward direction.

The most difficult part of the program so far is texturing the objects. To do this, there are various texture commands such as `glTexImage2D`, which is the final command to load in a texture from an image. The hard part is actually loading in the image from a file into the program. I have to read in the header, and then read in 4 bytes for each pixel (red, green, blue, alpha). I store this in an array of unsigned chars to load into video memory as a texture. I have run into a problem, however. After loading the texture into memory, the image will not load into OpenGL video memory, thus I cannot use textures.

Objects are a class and they are loaded in from a file called `objects.txt`. The objects are arranged to create a simple 3D world. The HUD contains a score, time elapsed in seconds, a dot for aiming, and frames per second. The program is divided into separate files for objects, projectiles, enemy projectiles and the main program.

The program is not as complete as I would like it to be. There are no enemies and the score system is not complete. Textures never worked and the lighting is funky. However, it would not take too much additional time to add more features because of my programs organization and strong foundation.