Project Overview

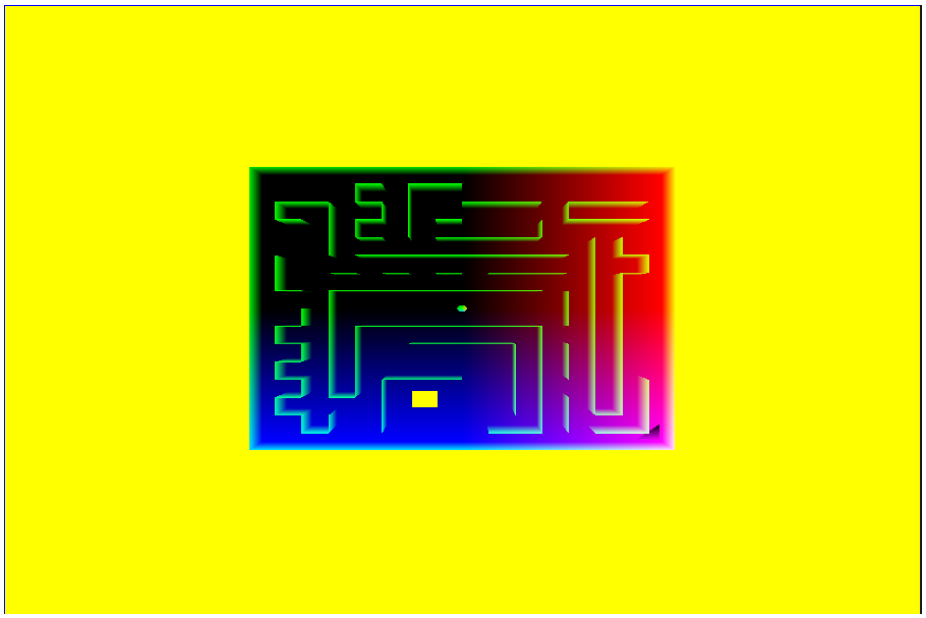
This is a labyrinth program. The labyrinth consists of a ball, a board with walls, and a hole. The player can rotate the board and the ball rolls according to the tilt of the baord. When the ball goes into the hole, the game is done.

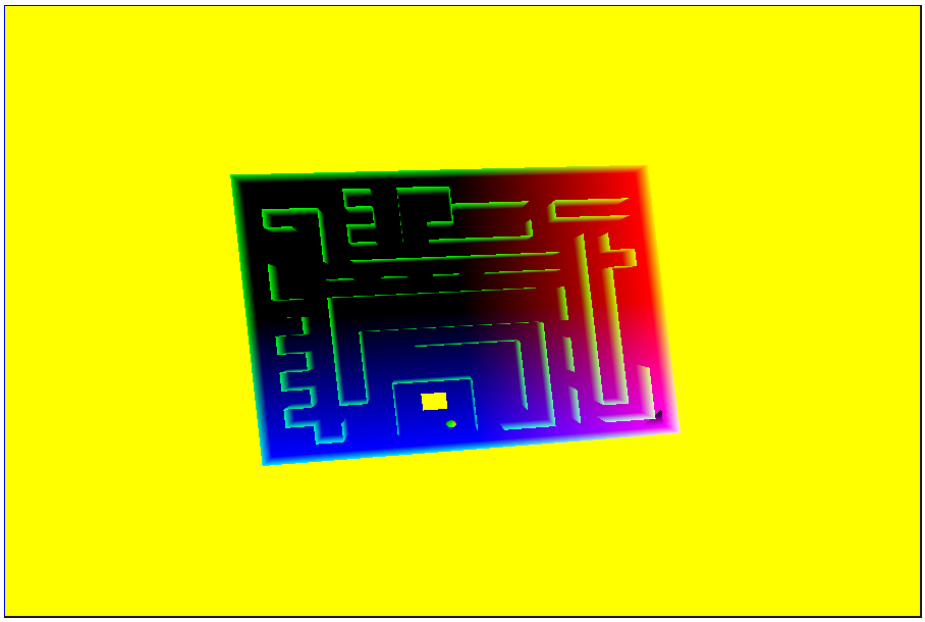
User Manual

$ program
. (*INITSCRIPT*)./< $(BALL) $(BOARD) $(VSHADER) $(FSHADER)

movement The player can tilt the board with arrow keys.

right click menu quit pause resume configure — . . .





Tech Manual

Overview

This program uses two Wavefront format objects to represent the ball and the board. The board needs to have a hole(s). This program uses OpenGL to render objects within the GPU, and uses two external libraries :

- Assimp Import Library (Assimp) to read in the Wavefront mesh objects that represent 3D structure and material of the objects. This program is currently using the Wavefront mesh objects, but Assimp is not restricted to this specific format.
- Bullet Physics Engine (Bullet) to handle the collisions of the ball and the board. bt...

Assimp is used to convert 3D mesh objects into the formats OpenGL and Assimp can understand : vertex buffer objects (VBO) and Triangle Mesh object, respectively. After the mesh objects are converted into these formats, Bullet will be in charge of synchronizing the positions and orientations of the 3D objects. Bullet manages the transformations done for each object by one matrix from the position the object was originally located. This matrix is used as a model matrix in the vertex shader. This matrix can be obtained by getOpenGLMatrix() method defined on btTransform.

In addition to these libraries, there is one convenience C++ wrapper class called Obj. The input to this class is a 3D mesh object file, and it creates and manages a Bullet object (btTriangleMesh), a model matrix, and a VBO. This class can communicate with Bullet with its updateModelMatrix() method that takes the matrix getOpenGLMatrix() (Bullet method) produces. Once the matrix is updated, this class can draw the object by the matrix and VBO it manages internally with its draw() method.

Issues

Presentation