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| Pool Table |
| CS 480 – Computer Graphics  [PA11] Dec 18, 2017 |

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**User Manual**

**Building and Running**

From the main (PA10) Directory:

mkdir build

cd build

cmake ..

make

./Tutorial

**Command Usage**

Tutorial - Will run using the default configuration of config.json.  
Tutorial --help - Pull up the help menu / command usage  
Tutorial <config> - Run the program with the given config file (e.g. "Tutorial config.json")

**Controls and Menu Usage**

**Controls**

Esc - Close the program

right click - Hold and drag to rotate camera

left click - Click and hold on the cue ball to power up a shot

left click – Places cue ball at start or after scratch  
Scroll wheel - Zoom in and out  
N - To start a new game.  
P - To pause the game.  
O - Options menu.  
WASD - Horizontal camera Movement Shift/Ctrl - Vertical camera movement.

up/down arrows - Widen/narrow spotlight

**Menu**

Open options from the file menu at the top or by pressing O.

**Game Options** (Click on the header to open)

**Sound Options**

**Music –** Music on/off

**Sounds –** Sounds on/off

**Ambient Lighting**

Change the strength and color of ambient light using the box and slider on the right**.**

**Graphics Options** (Click on the header to open)

**Shader Type –** Choose between Vertex and Fragment shading.

**Shadows –** Choose shadow quality.

**Dependency Instructions (required to run)**

To run this project installation of these three programs are required [GLEW](http://glew.sourceforge.net/), [GLM](http://glm.g-truc.net/0.9.7/index.html), and [SDL2](https://wiki.libsdl.org/Tutorials) (including mixer for sound).

The project also uses [ImGUI](https://github.com/ocornut/imgui) and [JSON for Modern C++](https://github.com/nlohmann/json), both of which are already included.

This project uses OpenGL 3.3. Some computers, such as virtual machines in the ECC, can not run this version. In in order to run OpenGL 2.7 follow the instructions at [Using OpenGL 2.7](https://github.com/HPC-Vis/computer-graphics/wiki/Using-OpenGL-2.7)

This project uses ImageMagick++ for loading textures. We have found that there are various forms of ImageMagick++ that can conflict with each other. In order to be sure that ImageMagick++ is installed properly for this project, we recommend removing all other forms before installing the libmagick++-dev library. sudo apt-get remove \*magick\* should handle this removal.

This project uses [Bullet Physics](https://bulletphysics.org/).

**Installation for Ubuntu/Linux**

sudo apt-get install libglew-dev libglm-dev libsdl2-dev libsdl2-mixer-dev libassimp-dev libmagick++-dev libbullet-dev

**Overview**

**Extra Credit Checklist**

* Shadow Mapping (shadows)
  + Automatically on. More options via graphics section of options menu.
* Music
  + Options menu can turn music off (is on by default)
* Game Replay
  + Press N to start a new game at any time.
* Billboards
  + Billboards used to show power gauge of shot and game over screen.
* Mouse Picking
  + Clicking on the cue ball will hit it in the location that was clicked.
  + When it is a new game or cue ball is scratched, mouse picking allows placement of the cue ball.
* Menus
  + Options menu accessible from the Menu Bar or by Pressing ‘O’
  + Menu used as a GUI to show in game details

**Tech Manual**

**Some difficulties:**

* Mostly the schedule crunch - so time constraints were an issue.
* Getting friction and restitution to feel good/semi-realistic

**Some things to include given more time:**

* Adding a pool stick to hit the cue ball with.
* Skybox and Environment mapping
* Correct some game logic (such as placing a scratched ball on the correct side of the table)
* Place the sunk balls in one of the pool table ball windows