Air Hockey Guide: Graduate Student 680

Liesl Wigand, Khoa Tran

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1 Introduction

This project is intended to implement a virtual Air Hockey Game using OpenGL.

2 Overview

General Credit:

- Board, Paddles, and Puck in the bin/assets/models folder
- Physics: paddles hit walls, puck bounces off of everything.
- Textures: see below or in game
- Movable Camera: limited motion, but does move: arrow keys.
- Mouse Control: a little bit buggy, locked to blue player.
- Menu Items: Restart, Pause, Resume, Exit, AI
- Display Scores: At top, slightly stretched

680 Credit, Required:

- Simple AI
- Toggle AI and 2 player
- Changeable Paddle Shape (press 1 or 2)

Extra Credit:

- Swap Puck
- Defensive AI mode - Plays goalie position
- Offensive AI mode - Plays offensive position
- Offensive/Defensive AI mode - Plays mid-field position

3 Compilation Directions

In case it has been closed, the folder you are looking for is "Projects/cs680/ Assignement 09". In order to compile the program go to the build directory and run:

```
cmake ..
make
```

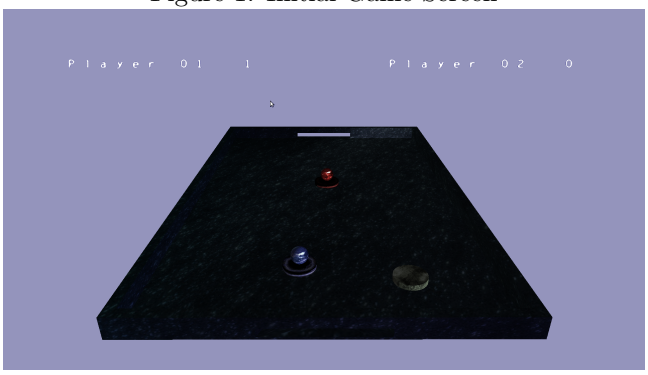
This should create an execuatable named pa in the bin directory, so navigate up one, then into bin and type:

```
./pa
```

to run the game.

4 Game Play Directions

Figure 1: Initial Game Screen



There is no visible menu. Right click to bring up the options:

Pause/Resume
Toggle AI as:
– Defensive mode
– Offensive mode
– Balanced mode
Swap paddle
Swap puck
Restart
Quit

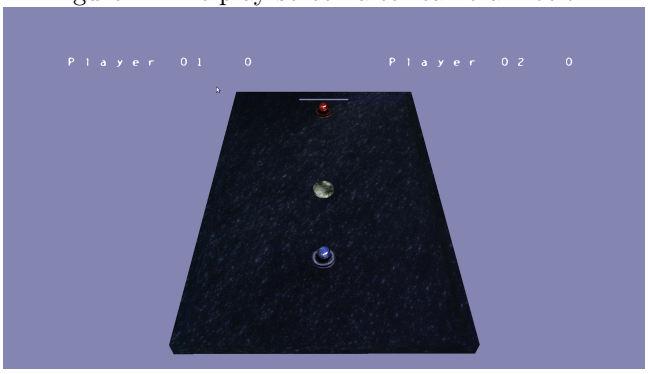
Player 1 (Blue) may use the mouse to control their paddle, or the keys WASD.
Player 2 (Red) may use the ijkl keys, or they may be swapped to an AI player.
The camera may be moved using the arrow keys, but will not rotate: it is limited to moving forward to an overhead view, or back, and will remain directed at the table.
The numbers 1 and 2 on the keyboard switch between paddle shapes.

5 Technical Difficulties

Resetting the game was difficult. There were issues getting objects to correctly leave the physics world, or return to it at a new position. There are still physics issues, most of which stem from the fact that meshes cannot collide with meshes, only with simpler objects. So the Paddles are convex objects and have somewhat buggy collisions.

There were also issues with textures that seemed tostem from oddities in Blender: blender has no problem at all with providing textured objects without

Figure 2: The play screen after camera motion.



texture coordinates. There are also certain images which were not loading correctly because the image was an incorrect size, but no errors were given. Instead a phantom rainbow texture appeared. Trippy.

6 Resources

This projects available online at bitbucket:

https://bitbucket.org/khoat/cs680