COMP 5411 Project Proposal (Group 4)

CHEN Junming & ZHANG Qingwen

1 Group Composition

Group ID: 4

	SID	Background	
CHEN Junming	20750649	Computer Vision	We both have no prior graphics programming experiences.
ZHANG Qingwen	20749872	End-to-end reinforcement learning for self-driving	

2 Description

2.1 Subject

3D Breakout Game with Customizable Control Panel

2.2 Brief description

Breakout is a classic game that was firstly released in 1976 on the Atari 2600 console. In the initial version, a player needs to control a small paddle on the ground to destroy all the bricks by bouncing a small ball towards each brick in a 2D space. The player has to catch the ball using a paddle so that it does not reach the bottom ground. Once the player destroys all bricks, he wins the game.[1]

Figure.1 First Version of Atari 2600 video game

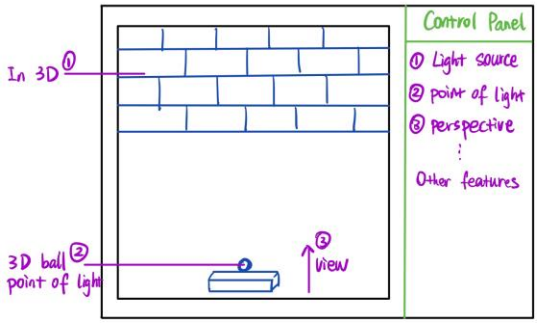

Figure.2 Our future framework (Outline)

We want to implement a similar breakout game based on this initial version. The difference of ours is that we will construct this game in **3D** space under canonical coordinates and apply the **lighting effect** we learned in classes on it. Specifically, the bricks, peddles as well as the ball will all be 3D, and the ball will be a moving point light source in our game.

Framework – Outline: Firstly, we will use three.js to make walls more fantastic in 3D. Secondly, the light source can be changed in the control panel, for example, when we switch the light source to point from the ball, this means area 1 will be dark if the point light isn't strong enough, and in this situation, you need to remember the wall position when the ball lights the area. In this part, we will use what we've learned in lectures. Thirdly, the perspective view can

be changed in the control panel, which is a totally new feature for this game, for example, you can choose the third-person perspectives like figure 2 shown or the first-person perspective whose center is the panel.

3 Challenges

The challenges will be **learning the WebGL** with three.js library and new programming languages from scratch. We will use knowledge from lectures like lighting. We also need to figure out **the logic of this game** in our coding (such as bouncing based on physics) and implement the **lighting effects** and control panel part in 3 weeks.

4 Timeline

Week	Date	Content
1st week	11/9-11/15	• Finish proposal and 1mins pitch video • Learn the basics of WebGL and related languages. • Build a basic framework of the game.
2nd week	11/16-11/22	• Complete the logics of the game. • Start working on lighting effects.
3rd week	11/23-11/29	• Finish the lighting coding, debugging. • Finish UI and customizable settings. • Finish report and video demo by end of this week.
4th week	11/30-12/1	• Submit the report and video demo

References

[1] Breakout (video game) https://en.wikipedia.org/wiki/Breakout_(video_game)

[2] Class Syllabus http://home.cse.ust.hk/~psander/hkust_only/comp5411/