

**NANYANG
TECHNOLOGICAL
UNIVERSITY**
SINGAPORE

IM2073

INTRODUCTION TO DESIGN & PROJECT

GAME PROGRAMMING REPORT

SLITHER HOSTAGE

INFORMATION ENGINEERING & MEDIA

SCHOOL OF ELECTRICAL & ELECTRONIC ENGINEERING

PROUDLY PRESENTED TO YOU BY:

TAN KHAI MING (U2122111B)

SEAN YOUNG SONG JIE (U2122305F)

TABLE OF CONTENTS:

| | | |
|-------|------------------------------|----|
| I. | INTRODUCTION | 3 |
| II. | GAME DESCRIPTION | 5 |
| III. | GAME REQUIREMENTS | 6 |
| IV. | GAME SPECIFICATIONS | 6 |
| V. | USER INTERFACE | 7 |
| VI. | CHALLENGES FACED & SOLUTIONS | 11 |
| VII. | CONCLUSION | 12 |
| VIII. | GAMEPLAY VIDEO | 12 |
| IX. | TEAM MEMBER CONTRIBUTIONS | 13 |
| X. | REFERENCES | 13 |

I. INTRODUCTION

BACKSTORY:

In the near distant future, year 2025, there lies a day where a researcher by the name of Johnny Jester, who decides to conduct a field research as a means to source for new ideas for his upcoming research. Due to the high level of competitiveness faced within his industry, he decided to challenge his ambitions by venturing deep into the Amazon rainforest, where few humans ever stepped foot on, hoping to find something that could outshine his competitors.

Fast-forward ahead, he began exploring the rainforest, not letting every single interesting specimen get past him while he ventures deeper into the forest. After hours of exploring, he came across a glowing dragonfly and thought it might prove to be a useful specimen for his research. Hence, he took a stance and began cautiously approaching it. But it was given away when he accidentally stepped on a branch, causing a loud cracking noise. Not giving up, Johnny decided to give chase towards the glowing dragonfly. While attempting to catch the dragonfly, he was too engrossed to observe his surroundings and stumbled into a hole, with the dragonfly nowhere to be seen.

However, he was stopped in his tracks as he caught attention of a supernatural, yet futuristic event happening right before his very eyes. He saw what seems to be a teleporter that seems to be leading to another dimension. As a technology that has yet to be seen even in humanity's most modern technology. "This could be the perfect specimen to research on!", Johnny thought to himself. He could not contain his excitement of the finding that was presented before his very eyes.

Feeling really excited, he hurriedly approached the teleporter to closely examine it. Unbeknownst to him, he triggered a magic trap and was trapped in it. Unable to escape, it is later revealed that it is a handiwork by an evil sorcerer bearing the name of Vexanium the Hexer, who has been living in this world for centuries. As one who has been alive for too long, he ventured the wrong path and now seeks excitement from witnessing how one with a finite lifespan fights for their survival in life threatening situations. However, eliminating all hope of survival from his test subjects will hinder their desire to fight. Hence, Vexanium provided Johnny with a glimmer of hope, promising that if he was able to demonstrate his strong will for survival and complete all his challenges, he would turn him back into a human and send him back to his world.

For this time round, the evil sorcerer decides to recreate a simulation of the Snake game in which piqued his interest in the 2000s decade. Thereafter, he turned Johnny into a snake and teleported him into one of his dimensions designed to conduct the snake game.

Johnny, who is now a snake trapped in the middle of the enclosed field in another dimension, will be given food by the evil wizard through a magical food summoning spell that was casted on the entire playing field. In the meanwhile, predators will be chasing after him while he tries to complete the challenge set up by Vexanium.

Johnny, who had no choice, begins his fight for survival...

II. GAME DESCRIPTION

OBJECTIVE:

Based on the backstory, the player (also known as Johnny), has to complete the challenge set up by the evil sorcerer, Vexanium. The challenge consists of 3 stages, with its difficulty increasing each stage. The player has to help Johnny complete the challenge so he could return back to his world.

HOW TO PLAY:

After being transformed by sorcerer, the player will start as a snake and he has to collect food that randomly spawns in the playing field while being chased by predators. For each food collected, the snake's body will elongate and accumulate throughout the challenge. The player will only be required to interact with the keyboard with controls as follows:

- ◀Steer Left – Left Arrow or A
- ▶Steer Right – Right Arrow or D
- ▲Boost – Up Arrow or W
- ▼Brake – Down Arrow or S

HOW TO SCORE:

For each food consumed, the player gains 1 score while gradually increasing in speed as the score accumulates higher. The player will move on to the next stage once he/she has collected 10 pieces of food. The number of predators chasing the player will be dependent on the stage number (e.g. stage 1 will have 1 predator, stage 3 will have 3 predators). A timer of 90 seconds will be given for each stage. The player will lose the challenge (Game Over) if he/she collides with any obstacle/wall/predator/its own body or when the timer hits 0.

HOW TO WIN THE GAME:

The player has to help Johnny complete all 3 stages by collecting a total of 30 pieces of food, an escape portal will be summoned by the sorcerer as promised, in which the player has to go through to win the game.

III. GAME REQUIREMENTS

Knowledge in programming C#. Experienced in using VS Code for coding and Unity for 3D game interaction. Great to have some sense in design and able to ask for help when needed.

IV. GAME SPECIFICATIONS

Software & Technology Used:

IDE – Visual Studio Code

Unity – UnityEngine, UnityEditor

Programming Languages – C#

V. USER INTERFACE

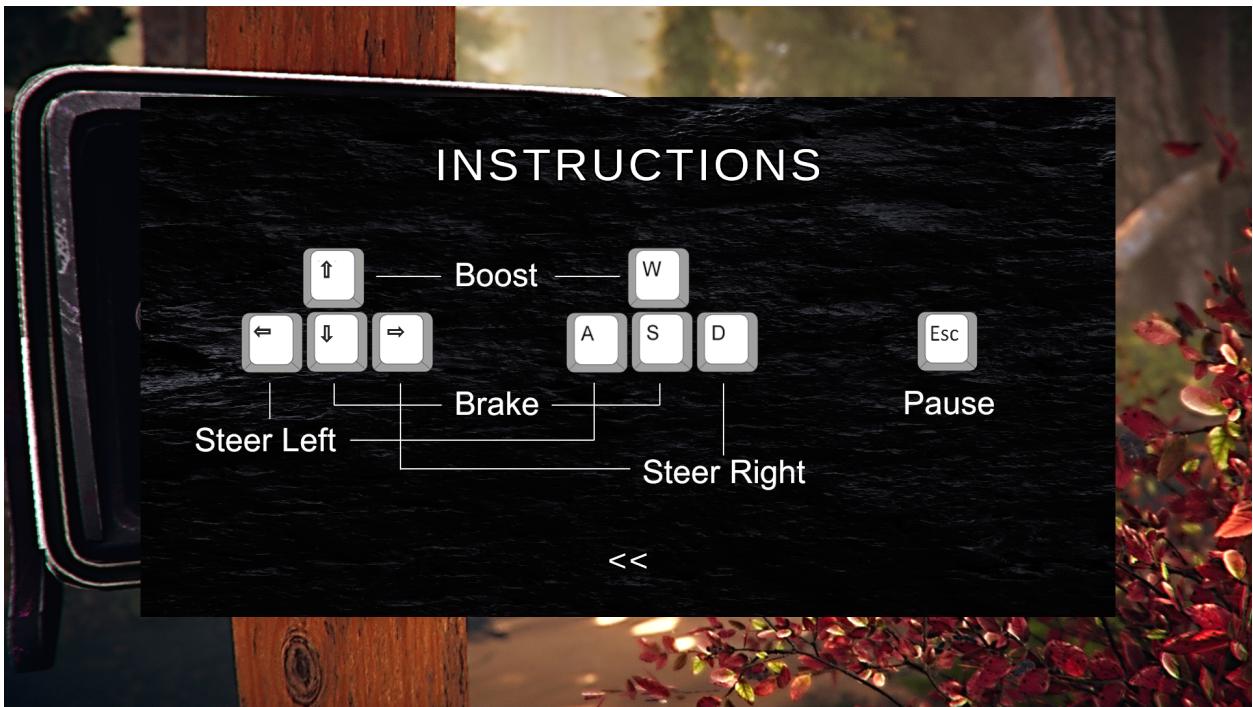
Main Menu – Displays upon the launch of the game



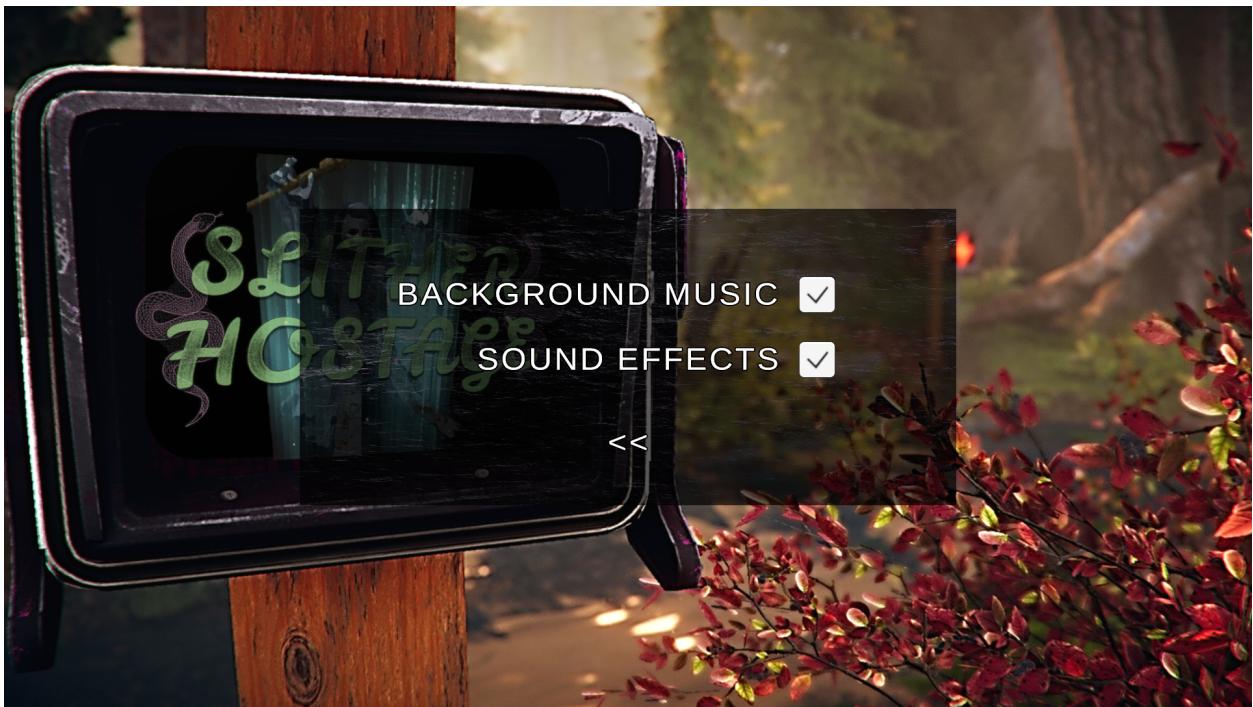
Start Game – Displays after selecting “START GAME” from the main menu



Instructions – Displays after selecting “INSTRUCTIONS” from the main menu



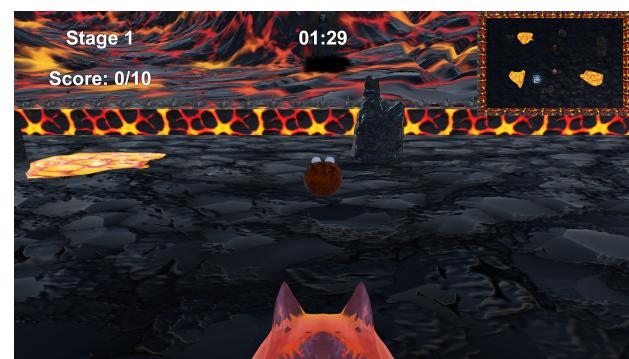
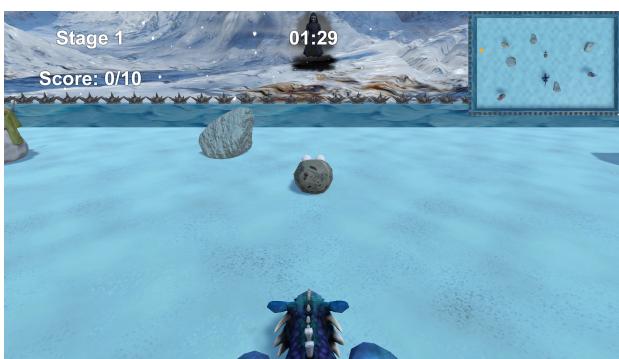
Options – Displays after selecting “OPTIONS” from the main menu



Pause Menu – Displays when ESC key is pressed while in game



Gameplay – In 4 different maps



Game Over – Displays when player dies (Snake head collides into wall/obstacle/own body/predator, times up)



Congratulations – Displays when player collected all 30 food and entered the portal



VI. CHALLENGES FACED & SOLUTIONS

- Game not functioning properly after build

Challenge: After building the game into an .exe format, the game no longer functions as intended as what we experience in the Unity editor.

Solution: We realized that some of the game objects in the scene are not linked to the prefab version. After recreating the object, the game successfully functions as intended.

- Difficulty differentiating between Prefab vs. Gameobject

Challenge: There has been several occasions where amendments made to a certain object but it was not updated in another similar object.

Solution: We went online to read up and understand the difference between them so we no longer generate the same issue again.

- Time constraint

Challenge: There is not enough time to design the game object models ourselves to perfectly fit our game scenario.

Solution: We source for pre-made models in the Unity Asset Store that are suitable for our game to prevent unnecessary wastage of time.

- Making the snake movements realistic

Challenge: Most of the tutorials online are snakes moving in a straight line which doesn't look nice.

Solution: We went online to search for a realistic snake movement tutorial and integrate it into the game.

VII. CONCLUSION

Through this 4-week project of getting our first hand experience in Unity, we have learnt to understand and appreciate more on the comprehensive process of how a game is developed. As gamers ourselves, we have been playing games since the past decade and have no idea how much time and effort has to be exercised into creating a game. Aside from programming itself, understanding how to aesthetically design the game map and user interface such as the main menu, pause menu, etc., as well as setting up the game rules are all essentials to produce a game worthy of one's enjoyment. Some other further implementations to make the game more interesting includes voicing the characters and making short video cutscenes, which could be realized in our project if not for the time constraint.

It has been an overwhelming experience to us as we were given only slightly less than 4 weeks to understand how to utilize Unity and familiarize ourselves with it. As such, this game project has led us to gain much respect towards game programmers. The 4 weeks have indeed been an eye opener for us who have never stepped into the Unity work space before.

Upon completion of the project, it led me to realize how powerful the Unity platform could be. It can be utilized to accomplish many interesting and meaningful projects due to its vast features, rich compatibility, easy prototyping and strong extensibility. Despite the end of the project, we still believe that further understanding of the Unity platform will be highly beneficial for our future career and studies.

VIII. GAMEPLAY VIDEO

<https://www.youtube.com/watch?v=5GeZmUQ2zTY>

IX. TEAM MEMBER CONTRIBUTIONS

Tan Khai Ming – Managed the design of the game environment, models and user interface (**50%**)

Sean Young Song Jie – Managed the game scripting and logic flow of the game (**50%**)

Overall, we believe that both of us have contributed equally to the development of the game.

X. REFERENCES

YouTube:

- *How To Make Snake 3D Game In 5 Steps | Beginner Tutorial In Unity.* (2021, July 11). YouTube.
https://www.youtube.com/watch?v=iuz7aUHYC_E
- *Making a game in Unity within 5 Hours - Snake 3D - Game development and showcase.* (2016, August 25). YouTube.
<https://www.youtube.com/watch?v=YyQ7nmbEkUE&t=2s>
- *Unity Game Dev Full Tutorial - 3D Snake Game.* (2018, November 23). YouTube.
<https://www.youtube.com/watch?v=8ztq9fQT6Kc&t=4697s>

Unity:

- Technologies, U. (n.d.). *Unity - Scripting API: Unity3D Documentation.*
<https://docs.unity3d.com/ScriptReference/>
- *Unity Asset Store - The Best Assets for Game Making.* (n.d.). Unity Asset Store.
<https://assetstore.unity.com/>

Google:

- *Google.* (n.d.). Google.
<http://www.google.com.sg/>