# Game Engines

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Conduct research about the use of game engines in real-world projects.

B.A. (Hons) in Game Art and Visual Design

Williana Blundell

# Task 1: Conduct Research About the Use of Game Engines in Real-World <u>Projects</u>

# Game Description

#### Game Narrative

In the city of Grimville, all citizens carelessly threw all their hazardous and toxic waste out, that was drained off into the city's underground sewer system. However, the citizens were not aware that the cockroaches, that lived underground, started to consume all the chemicals that were present in the water. This caused a chemical reaction with their DNA structure, and made them bigger, powerful, smarter and into Roaches! All having the same objective, to conquer the city of Grimville. The only person is capable to stop the Roach Infestation, the one who poses the potion that kills all cockroaches underground, and that is Joe the Pestinator.

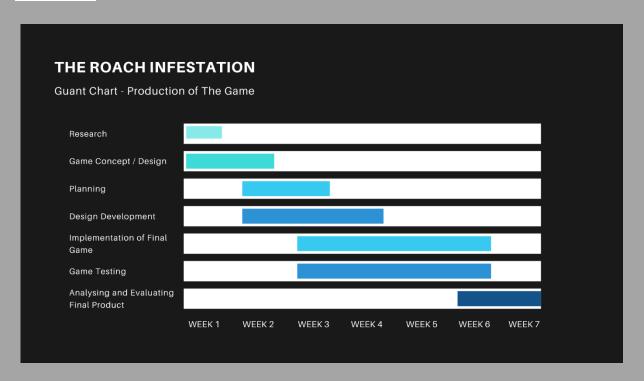


### Game Synopsis

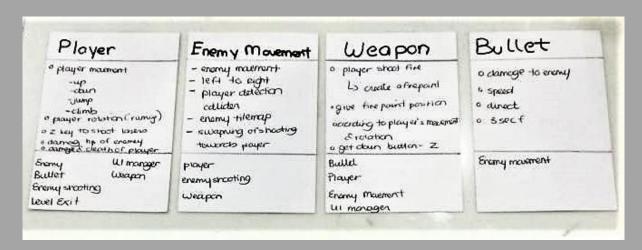
The main objective of the game is that the player plays as Jo, the Pestinator character because he is the protagonist of the game. Furthermore, his role is to make sure to survive

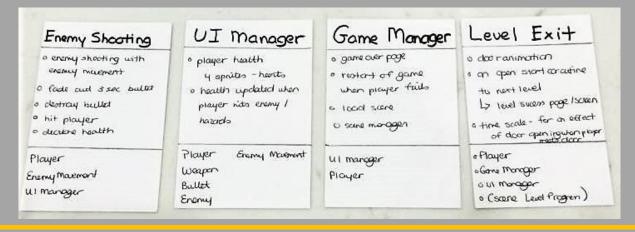
during the fixed level, by not getting hit by the slime of the Roaches. To go up a level, Joneeds to eliminate all the Roaches present in the level and reaches the exit for the next level.

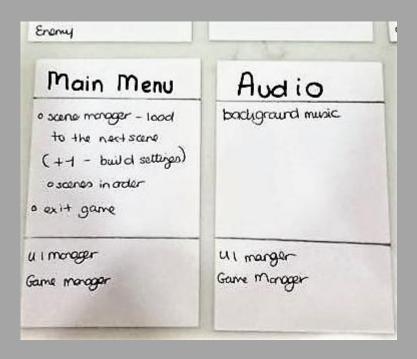
#### **Guant Chart**



#### CRC Cards







Task 2: Prepare Workspace and Assets for the Game

#### Target Device

For the fixed level, Roach Infestation Game, I am aiming to design the game for both webpage and android/tablet design platform. As for the screen resolution that I will be working on the Unity program, for the webpage, it will be in the ratio of 16:9 converted as 1920 x 1080 aspect ratio for a full HD quality.

#### Control methods and Game Mechanics

#### Core Mechanics

- → Players get to manoeuvre around the user interface, each screen taking them to different sections of the game.
- $\rightarrow$  Players get to control the protagonist of the game, which is Joe th pesterminator.
- ightarrow The players can move the player through control methods:
  - Left arrow key to make the player run to the left
  - Right arrow key, to make the player run to the right.
  - Up arrow key to make the player climb up ladders.
  - Down button key to make the player climb down ladder.

- Players can make the player shoot acid slime towards the enemy, The
   Roaches, by pressing the z or cntrl buttons.
- Players can make the player to double jump by pressing the space bar.
- → The mechanics of the game is a fixed level, 2D platform, were the player navigates through various obstacles such as hazards and enemies. The objective of the game is to take the protagonist to the top level to pass through the door to succeed in completing the level.
- → The screen movement of the game, the main camera has a cinemachine attached to it, giving the flow of the game smooth as the virtual camera follows the character towards the tiled map, environment.
- → Health bar, decreases as soon as the player hits the enemy or hazards;
  - Enemy -1 out of 3 hearts
  - o Hazards minus 3 hearts restart game

#### Gameplay

The gameplay of the game is that the players are encountered with the protagonist that leads them to a fixed level platform. The players need to control the player and take him to the finish line, that is the door that will lead him "to his next mission". The players need to avoid hitting the player through hazards such as the water and spikes, and when the protagonist encounters the enemy, the players must attack the enemy using the shooting mechanics that the character has, and avoid being hit by his mutant eggs.

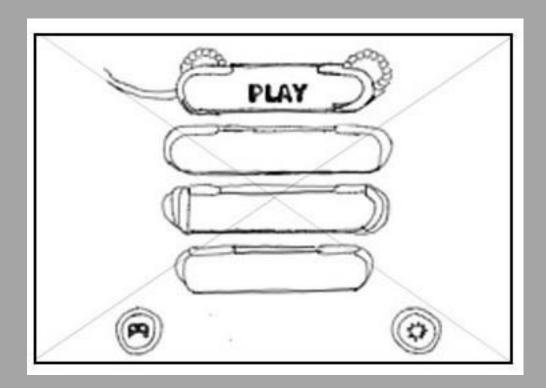
#### (Music/Sound)

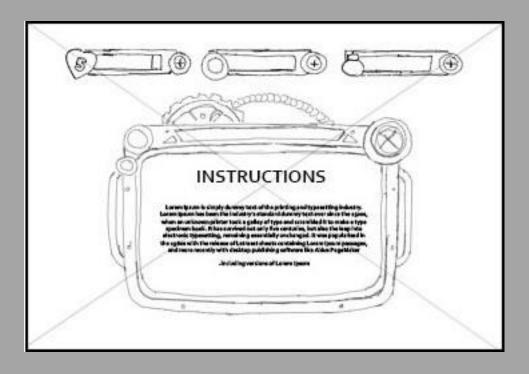
The game has a simple ambience music that is a classic, bouncy, 2D mellow tunes that entices the player more in playing the game.

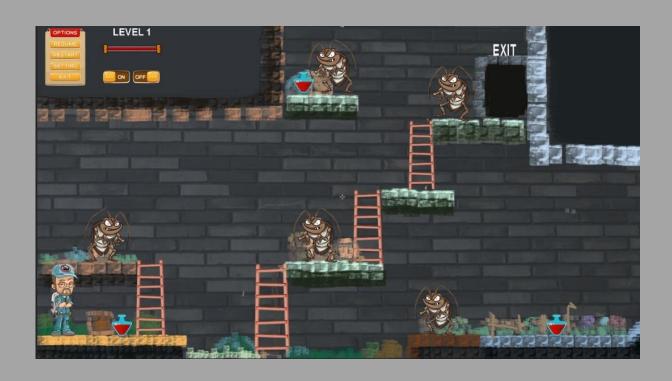
#### Game Screens

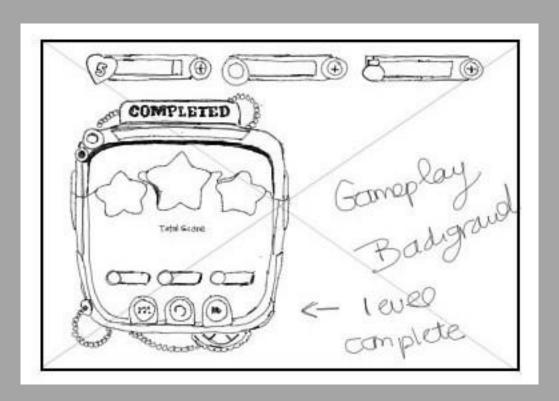
- $ightarrow \,$  Main menu
- → Options
- ightarrow Instructions
- ightarrow Gameplay
- ightarrow Level Complete

#### ightarrow Game Over page





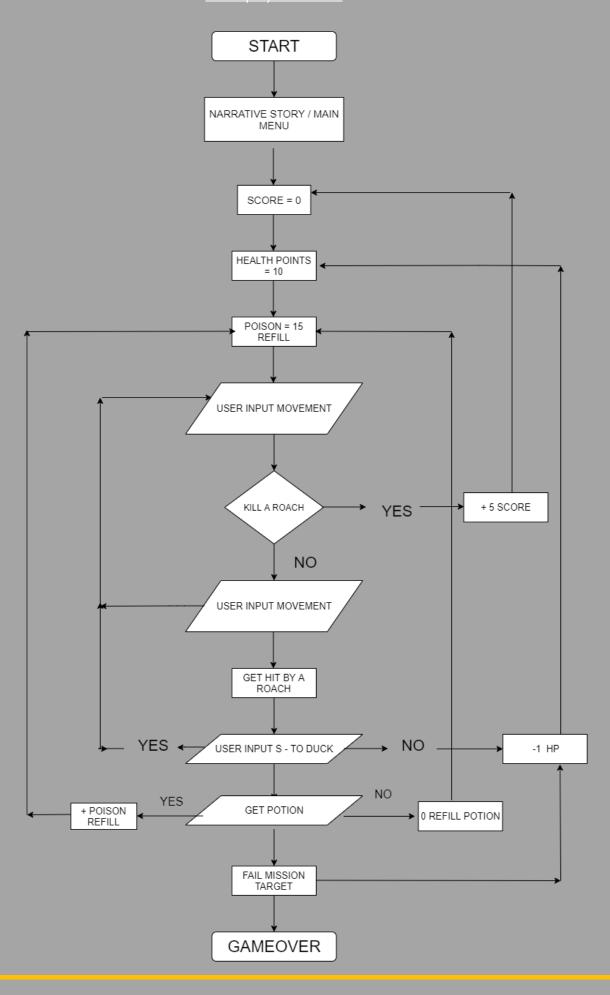






Background design

## Gameplay Flowchart



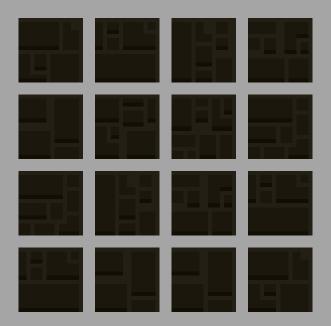
#### Game Objectives

The aim of the game, The Roach Infestation, is for the player to control the protagonist, throughout the one fixed level game. Player also need to avoid obstacles for their characters in order not to get hit and get instant death and restart of the game. The player controls the character through basic core / control mechanics such as running, left and right, climbing up and down the ladder using the arrow keys, jumping by pressing down the space bar and shooting acid slime towards enemies by pressing the z button or cntrl button. The player only has three lives, gets hit by enemy -1, hits by hazards -3 health points. Getting the player to the door is when the level of the game is complete.

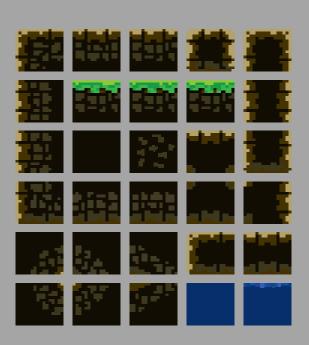
#### Art Assets and Theme

The main theme and concept of the game is a classic 2 D online / Web game, that its art style is quite drawn cartoonish, giving it some humour, revolting and robust style. The art is a mixture of hand drawn characters, animations, background and user interface, to other additional online assets for extra detail. The Background gameplay is created using assets of tile map, through tile map palette I assigned the chosen tiles, and divided the platform into background, foreground and interactable, giving the game more depth to it. The characters animation is hand draw, precisely on Adobe Photoshop, using grid, cell size 100 x 100 pixels, making sure to use the same resolution of the screen as of the game 1920 x 1080 pixels, 300 dpi for excellent quality and smooth animations. Hazards and interactable are added throughout the platform creating obstacles and loading of scene managers. As for the user interface, keeping with the same style, colours and theme with the game to make the interaction between player and the gameplay more reachable, easy to understand and navigate.

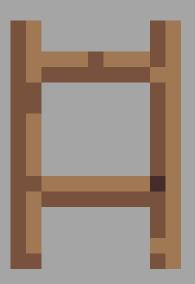
#### <u>Two-Dimensional Downloaded Game Assets</u>



BACKGROUND TILE MAP
PALATTE



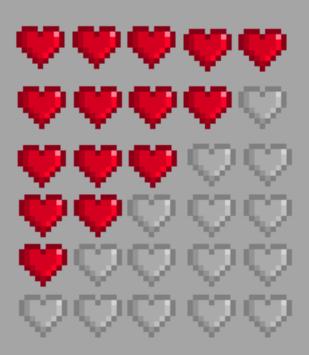
Foreground / Hazards / interactable TILE MAP PALATTE



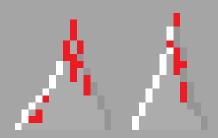
Ladder tile sprite



ANIMATION DOOR SPRITE



HEART HEALTH BAR SPRITE



SPIKES HAZARD TILE



HAND DRAWN CHARACTER DESIGN - PROTAGONIST































100 x 100 CELL SIZE, ANIMATIONS HAN DRAWN, CHARACTER ACTIONS: RUNNING CLIMBING IDLING AND DYING





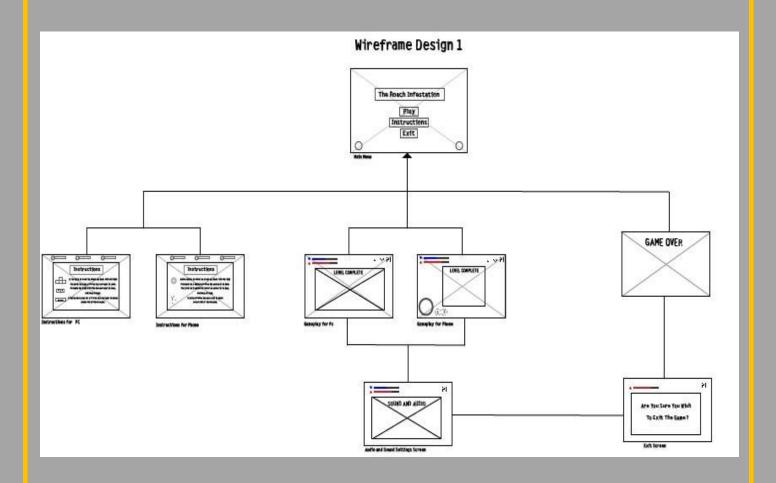
HAND DRAWN ENENMY DESIGN

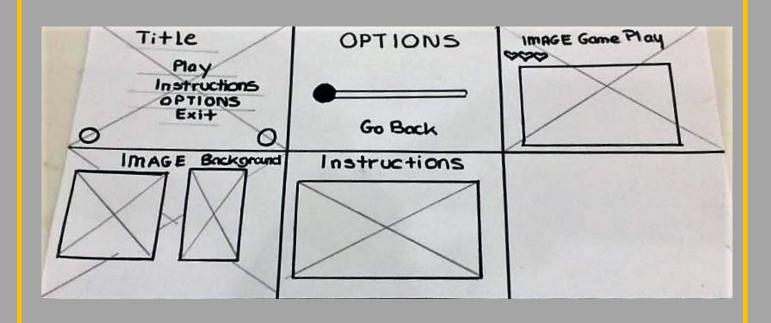




ANIMATED HAND DRAWN 100X100 CELL SIZED ANIMATED ENEMY ACTION: WALKING AND DYING

# <u>User Interface Wireframe & Outlines</u>





#### **Evaluation**

For my second game concept design, coming up with an idea was easy as I already had a concept and art style in mind. I wanted to create a classic, fixed one-level game, the premise and objective of the game is quite straightforward, simple to understand and easy to follow the user interface. However, creating in detail CRC cards, and deciding how and what are the important core mechanics of the game was quite difficult, and experienced various obstacles throughout the gaming process. I understood how the game should flow, through the help of the flow chart and wireframe design, however, due to the lack of experience in C# language and only knew the basics of the program Unity. I had the difficulty of understanding the logics of how the scripts are written in relations to other mechanics as I'm new to the subject. Especially when it came to code the enemy movement, as the colliders were causing various faults with the foreground, the background and with the player, especially the enemy spawning bullets towards the player. Once I got through the hard parts, I still managed to come up with a working game, maybe the outcome was not the way I planned from the start, for example not adding the collectibles that the player can pick and the likes. Ways of how I could improve more my work, would be the fact that I should have dedicated time to create a design and hand drawn the tiles of both the background and the foreground, should have added more elements of user interface during gameplay, such as elaborating more the health bar. Also, I wanted to add sound effects and foley in my game, however, due to the lack of experience, knowledge and time it was hard to do them. In my opinion the subject and the program itself and how the mechanics work is very interesting, however I felt that it was really tough to create a game as a beginner, in relation to load of work and lack of time due to other assignments. Although, I am pleased with my effort and hard work, I managed to create a fun and simple game.