



# Computer Games Development CW208

## GDD

## Year IV

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**DECLARATION**  
**UNDERGRADUATE ASSESSMENT WORK**  
**DECLARATION**

**Work submitted for assessment which does not include this declaration will not be assessed.**

- I declare that all material in this submission e.g. thesis/essay/project/assignment is entirely my/our own work except where duly acknowledged.
- I have cited the sources of all quotations, paraphrases, summaries of information, tables, diagrams or other material; including software and other electronic media in which intellectual property rights may reside.
- I have provided a complete bibliography of all works and sources used in the preparation of this submission.
- I understand that failure to comply with the Institute's regulations governing plagiarism constitutes a serious offence.

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24/04/2023

## **Acknowledgements**

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## Game Overview

I wanted to create a game that focused on improving immersion and I decided that a game in the horror genre would be the perfect fit. The game is a 3D horror game where a random map with randomly decorated rooms are key features as well as eye tracking.

The premise of my game is that you play as a man trapped in an abandoned hospital with a deadly and mysterious killer. There are no exits and the only way you can survive is to open up a safe which contains a gun. You arrive with nothing except a small flashlight which you must use to navigate the dark building and find the keys to open the safe and acquire the gun. The flashlight is pointed towards wherever your eyes are on the screen. The house and room layout are completely random each time and the location of the keys are different as well. The flashlight will shine on the screen wherever the player is looking and is the main source of light. The killer is in the house as well and will wander the halls in search of you. Wardrobes are scattered around the house that you can use to hide in. If the killer sees you, he will sprint at you and if he reaches you he will kill you. It is up to you to safely wander these halls in the hope of survival. Traps are laying around the halls which makes traversing very dangerous. It is up to you to survive the dangers of this cold and dark hospital and stay safe from the crazed Killer.

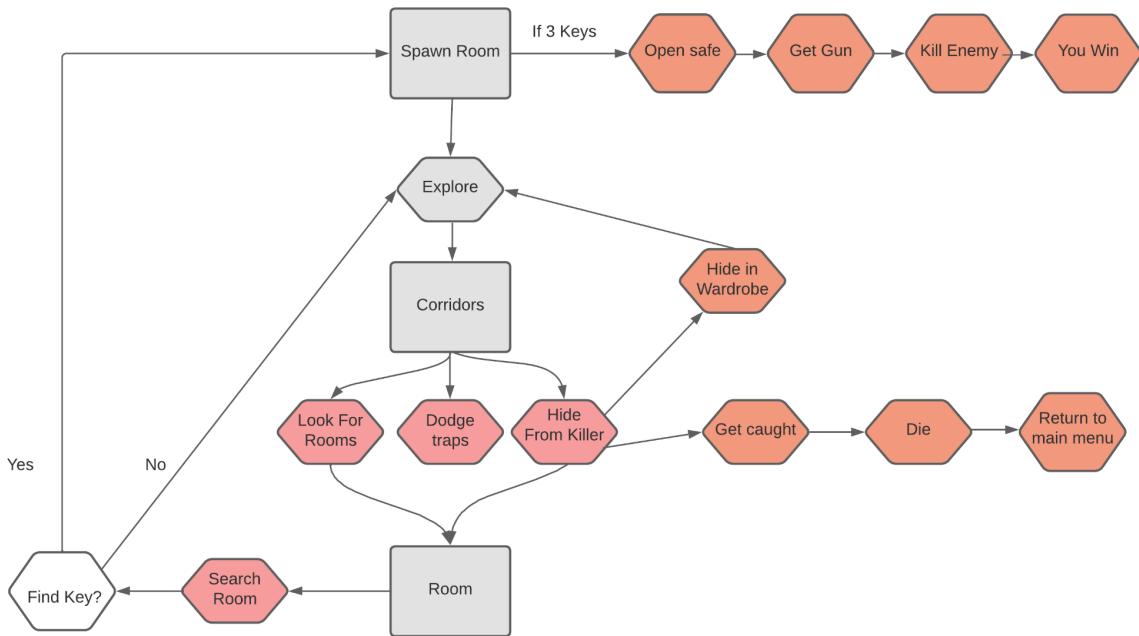
I want this game to focus on immersing the players in a horrific environment and atmosphere.

## Feature Set

### *General Features*

Random grid-based map generation  
tile-based room decorating  
eye tracking  
Killer AI, States, and animation  
focus on immersive audio and lighting

## Gameplay



The core gameplay will be a mix of both exploration and Surviving. The player must explore the map to find all of the keys to unlock the gun, but exploring the map itself is dangerous and the player must also try to survive as well.

### Exploration:

In the game, you spawn in a very dark house with a maze-like pattern. The overall goal is to traverse the map in search of special rooms with a chance to contain a key. 3 keys allow you to open up a safe with a gun inside that you need to reach the overall goal of the game. The map has a maze-like design so it is easy to get lost or disoriented with direction. The path you traverse should be noted as you travel through the map. The exploration will feature backtracking as you need to do this to reach all of the rooms. When the player spawns in the world around them is almost completely dark. There would be no way to traverse the map safely without the flashlight you spawn with. This slows down exploration as time must be taken to traverse without walking into objects, traps, or straight into the killer.

### Survival:

The game features a Killer doctor that roams the halls in search of you. It is up to you to hide and run from him for the sake of survival. The killer cannot enter special rooms or see inside wardrobes so these should be used to safely traverse the map. The killer can however see you enter a wardrobe if he is within your line of sight. He can then place a bear trap at the

wardrobe entrance that will trap you when you enter. Traps around the map will also alert the killer to your location. All of these traps add more depth to your survival as it forces a more careful approach to the game. The only way to survive and win the game is to shoot the killer with the gun which must be unlocked. until then you are completely defenceless in terms of combat.

## **Story**

### **Overview**

The story of the game revolves around the player's character being abducted by a killer doctor and taken to an abandoned hospital. The gameplay starts where this leaves off and the player must do everything they can to survive

### Narrative:

The story of the game takes place in the current year 2023. The player character was walking through the streets of Dublin late at night for an unknown reason and suddenly was found and abducted by a ruthless killer doctor that takes the unconscious body to a nearby abandoned hospital which is now the killer's personal playground to do as he pleases. The player's character wakes up confused, alone, and afraid. They are suddenly in a dark and bloody building that is unfamiliar to them. They notice weapons safe next to them on the ground. It looks like it was put there on purpose by the killer to mock how close they could be to opening it, however with no keys that is not possible. The player must search the rooms of the hospital in hopes of finding the keys needed to open the safe while the killer is stalking the halls.

## **The Game World**

### ***Overview***

#### Procedural generation:

The best part of the game world by far is that it is procedurally generated every time. Each playthrough will be completely random. The map layout and even the obstacles and decorations inside of the room will be different for each playthrough.

#### Abandoned Hospital:

The game world is set in an abandoned hospital so all textures, assets, and decorations will reflect this such as wheelchairs in the halls or dismembered bodies leaning against the wall.

#### Absolute darkness:

The abandoned hospital has no windows or light source. All source of light comes from the player's flashlight. This makes the world itself look much more eerie and different.

## ***The Physical World***

### ***Overview***

Describe an overview of the physical world. Then start talking about the components of the physical world below in each paragraph.

The following describes the key components of the physical world.

The physical world of the game is set entirely inside an abandoned rundown hospital with no electricity. As a result, the building is completely dark. The building is occupied by the killer who brings people here to kill them. As a result, the hospital is dirty looking, covered in blood and dead bodies, and has old hospital equipment such as wheelchairs.

### ***Key Locations***

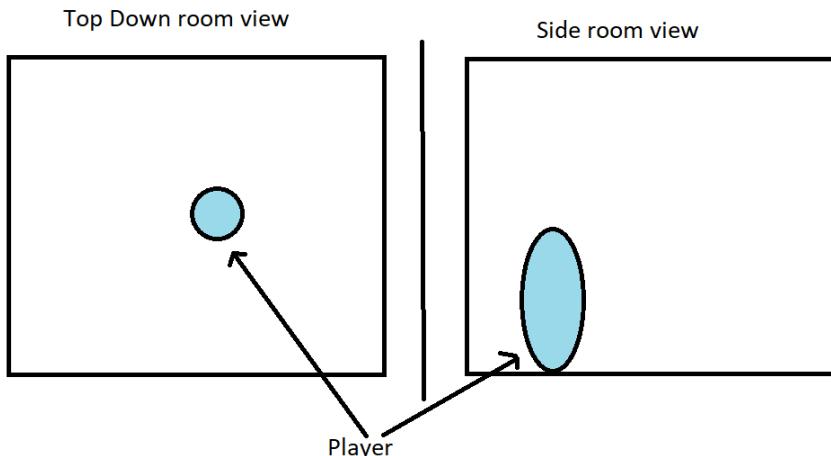
The key location is the dark and sinister hospital that the player wakes up in. The corridors are filled with old hospital equipment and dead bodies. There are rooms around the map that are filled with hanging meat carcasses

### ***Travel***

The hospital is fully traversable by the player. The player can walk there. The killer can also navigate through the halls. The player must travel to different rooms in order to find keys, and then must travel back to insert the keys into the weapons safe.

### ***Scale***

The map can have a random scale as it is procedurally generated. The map is also a set of long winding corridors with a random length. The grid that the map is made on is 50 x 50 so in theory a lot of rooms can be placed to fill up the grid, but in practice, the resulting building is usually smaller. The player itself is smaller than an average man as the killer towers over him. Below is a rough sketch of how big the player is in comparison the room size.



### ***Objects***

Keys: Keys can be randomly placed in special rooms. There are always 3 keys per game. As there are always 10 rooms it means that 3/10 rooms will have a key in it. 3 keys are used to open the safe to get the gun.



Gun: The gun is a key feature in beating the killer. The game only ends when the player is dead or the killer has been shot with the gun. The gun is found in the safe which is placed in the player's spawn room. Closing 1 eye with the eye tracker will trigger aiming the gun which will move the gun until the iron sights are in the middle for a more accurate reading of where the shot will go.



### ***Time***

There are no specific time limits to this game, however, the longer you stay in the building the more likely it is that the killer will find and kill you. Time has to be carefully managed between carefully traversing the halls, looking out for the killer, and exploring special rooms.

### ***Obstacles***

General obstacles: There are many obstacles on the map that can hinder the player. These can include obstructions such as a wheelchair in the direction you were going causing you to change how the room would be traversed. These obstacles cannot stop you from moving from

one room to another as there are preventions in place that stop it would from blocking all possible paths

Traps: There are bear traps occasionally on the floor around the map. If you get close enough to it it will trap you and you will have to wait a few seconds to get released. During this time the killer is notified to your position and will walk quickly towards it. Beartraps also will not block your path to another room but will act as another obstacle to look out for.

## **Rendering System**

### ***2D/3D Rendering***

This project will use the built in rendering engine provided by the Unity engine. This supports a variety of rendering techniques such as dynamic lighting, shadows, and particle effects which will be used in this project.

## ***Camera***

### ***Overview***

The game is in a first-person view so the camera will almost always be attached to the player. Other cameras are placed around the map that this main one will swap between. These will be for when you enter a wardrobe and when the killer catches you.

The game is first-person and so the camera will move with the player. The camera will be controlled by mouse movement to simulate where the player is looking.

#### ***Camera Detail #1***

When you enter a wardrobe the player's camera gets deactivated and a camera inside of the wardrobe gets turned on. This allows you to see out of a very small gap in the door of the wardrobe. This can be used to try and spot if the killer has walked by and adds suspense

#### ***Camera Detail #2***

The killer also has a camera attached to him. When he catches the player, the killer will do an attack animation and a camera will activate pointed towards him. This is to help simulate a scare with a jumpscare

## **Game Engine**

### ***Overview***

Unity is the Game Engine that I will use for this project. It has many helpful tools to make 3D games and makes it easy to publish to multiple devices. Unity also has an asset store which makes it easier to find all the assets and packages that will be used.

### ***Game Engine Details***

This game will feature a very large grid-based map generation algorithm as rooms can be placed in a potential 2500 different places. Unity is very reliable and is able to support the use of large numbers of objects. Unity supports a large range of external devices which is crucial for this project as it supports the Tobii Pro line of eye trackers. Unity provides the use of prefabs which will be used to easily populate the world with all necessary assets

### **Lighting**

Unity is great for handling lighting which will be an important part of my game. Unity contains a type of built-in light source called a point light which shoots light out like a spotlight. This can be modified into a flashlight that the player can use to shine wherever is needed. Unity also has real-time global illumination which can be modified. This can be used to change the overall darkness of the game.

### **Eye Tracking Support**

Unity supports the Tobii Pro Nano eye tracker which will be used in the project for several core game features such as providing the only source of light and also aiming the gun.

### ***Collision Detection***

Unity also has built-in collision detection for many different types of shapes which will be needed for this game. I can also detect collisions with meshes which will be helpful with the more complicated object models. It can also have 2 types of collisions, Trigger collisions and non-trigger collisions. Trigger collisions are used when you want to check if objects have collided, but not have them be impassable which non-trigger collisions provide. These varying options provide more flexibility.

## Game Characters

### *Overview*

**Player:** The game is played from a first-person perspective so information on what the player looks like is completely hidden. Doing this also hides what gender they are. This makes the main character more relatable to everyone regardless of gender or race. The player is noticeably smaller than the killer and obstacles around them. This might make the player think they are younger than an adult but nothing is revealed for definite.

**Killer:** The killer is a doctor who lives in this abandoned hospital. He has a sick and twisted mind. He enjoys slowly dissecting his unfortunate victims and leaving their bodies anywhere throughout the halls of the hospital. He prefers to stay in the dark and has grown used to living without light. He can see exceptionally well in dark areas where others cannot. He wields a rusty bone saw caked in old blood, and carries vials of his victim's blood around with him as a trophy.



### *Creating a Character*

### *Enemies and Monsters*

The killer character and animations are premade on the Unity asset store

## User Interface

### *Overview*

The game will feature only 1 source of UI which is a timer for the flashlight.

### ***User Interface Detail #1***

The flashlight timer will start as a white circle and as the flashlight is used, portions of the circle will be removed and Its colour will slowly change from white to red.

## **Weapons**

### *Overview*

Both the player and the killer have 1 weapon each. The player has a 6-bullet revolver that can only be used after opening up the safe to retrieve it. The killer wields his rusty and bloody bone saw

#### **Weapons Details #1**

The player can wield a revolver which is his only defence against the killer. It has 6 bullets and after using all of them you must reload. Shooting the killer with even 1 bullet instantly kills him

#### **Weapons Details #2**

The Killer wields a rusty bone saw that is caked in previous victims' blood. It is his favourite tool that is used for everything. If the player is in range of the killer, the killer will use it to instantly kill the player

## **Musical Scores and Sound Effects**

### *Overview*

This should probably be broken down into two sections but I think you get the point.

The game will feature a faint eerie backing track where the main focus is to provide a chilling atmosphere. This music should not overpower the other audio in the game as listening is a crucial part of the game. The music changes to a more dramatically scary tune when the killer is running towards the player. This tune is meant to distil fear, panic, and tension for the duration of the hunt. After the hunt is over the music resets to the ambient background song it was playing earlier.

Sound effects are an important part of the game as it not only adds to the game's atmosphere, but it also acts as a way for the player to get a better understanding of their surroundings. As the game is very dark, having extra audio cues for key events such as the killer walking nearby is extremely important. The sound effects in the game will include, Killer footsteps, Killer voice clips, and trap sound effects such as snapping bear traps. Sound effects will also

be used for simple things that don't benefit the player in terms of awareness such as door creaks and wardrobe thuds.

### ***3D Sound***

Unity can have a 3D audio option for all audio sources. This will be used to create spatial audio for every audio source in the game except for music. Music will be using constant 2D audio.

All sound effects will use 3D sound to add spatial immersion as well as positional awareness to the player.

### ***Sound Design***

The sound design in this game will be designed to add immersion by making the game world itself feel alive. sound effects of the killer being close should send a chill down the player's spine while also providing vital positional awareness. Getting caught in a trap should play a loud sound effect that will startle the player to simulate how the character would be startled in the game world. Overall audio and music should only add to the atmosphere and cold feeling that this game world is trying to portray.

Provide an overview as to how your characters will be rendered. You may have decided to include this elsewhere or break it out to provide more detail to a specific reader.

### ***Character Rendering Detail #1***

### ***Character Rendering Detail #2***

## **World Editing**

### ***Overview***

World editing is a massive part of this game as the level layout and room decorating are procedurally generated every time

### ***Random map generation***

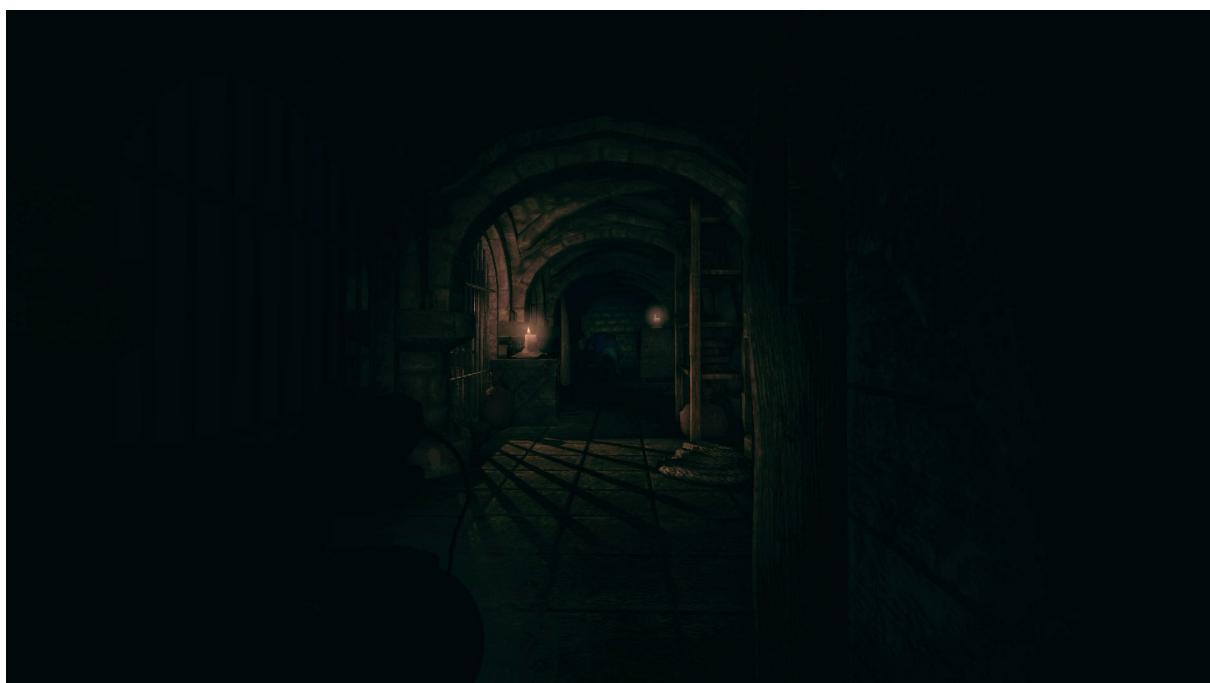
The map layout will be random every single time. This should ensure that the player will not get bored and the game should be endlessly replayable

### **Dynamic room generation**

The room will be dynamically filled with obstacles and decorations. Each room will look entirely different to the rest. This makes the environment look original and engaging.

## **Inspiration:**

### **Amnesia: The Dark Descent**



Amnesia: The Dark Descent is a first-person horror which could be an inspiration for the overall tone and feel of the game as well as the use of ambient lighting.

The main source of light in this game is coming from the player with the use of a lantern. This is similar to my game where the player's flashlight is the main source of light. Additionally, the lamp from amnesia uses oil to restrict usage. My game has a similar mechanic where the flashlight can't be used too much as it has to be charged up after depletion.

There is an enemy in Amnesia that has several features that I want to add to my killer as well. This enemy wanders the halls and rooms in search of you and will change states based on whether he has seen you or not. I also want my killer to wander the halls and change states based on whether they have seen you or not.

## Dreadout



Dreadout is a 3rd person horror game that is made with the Unity engine. This game has compatibility with Tobii Pro eye trackers which is what I want to use in my game. The use of this eye tracking is similar to my game as well as the main character's flashlight getting pointed to where the player's eyes are on the screen. As this game is game in Unity, I am confident that implementing eye tracking into the game is at least possible.