



# METANOIA

Game Design Document 0.0.1



Faculdade de Design,  
Tecnologia e Comunicação  
Universidade Europeia

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# 1. Introduction

This document specifies the details of Metanoia, a 3D first-person low-poly single-player Psychological horror game, with mechanics, such as survival, gathering items, and mini-games.

The setting takes place in modern Europe, and the environment and the characters overall are of european origin. The player is known as "Child", being a 8-10 y.o. that came to the hospital to find his mother. The hospital is divided into sectors, with a certain amount of NPC's per sector.

Metanoia is a lore-based game, the main objective is to find the mother of the player character, doing the mini-games inside each level while avoiding the monsters.

Metanoia is inspired by games such as "Little Nightmares", "Outlast", and "Labyrinthine". The overall idea comes from "Outlast" with thematical changes and adaptations to the team's abilities.



*Reference Images*

## 1.1 Story

There once was an ordinary family with loving parents and a child. They lived happily, and the bond between the child and his mother has always been especially strong. One day, however, the disaster struck the mother, shattering her sanity in pieces and forcing the father to take her to the Insane Asylum. This has been later explained to the child in a form of a fairy tale, where his mother has become a princess and went to rule over a magical castle, living happily ever after. The child, fascinated by the story, would ask his father to retell it again and again in slightest details every night.

One night, the child, missing his mother so much, has decided to go and visit her in the castle. He grabbed his plushy and a backpack and headed outside, through the forest that was growing outside of the house. Navigating with the details from the fairy tale, he followed his mother's favourite flowers and finally arrived at the castle. There, he met a lot of friends that were also depicted in his father's story, some of them were friendlier than others and all would wear a funny animal mask. He also met a nurse and a janitor, but seemed to be disregarded by those as if it was not the first time they've met. There was also a dark shadow-like creature, moving around the main hall, as if searching for something, that resembled the child himself and that the child instinctively avoided. There were a lot of interesting things in there, but as the child traversed the castle grounds, the surroundings would more and more remind him of a hospital. At some point, the child gets caught by a nurse, angry at him making noises and going around the places he is not supposed to be in. However, the nurse's face and hands are so ugly that the child collapses.

When he awakes, the wave of realization strikes him as everything around looks just like the Insane Asylum he vaguely remembers getting into. Struggling with hallucinations and his distorted reality, he reaches the end of the story by finally getting into his mother's room and finding nothing but her dead body. The child then sees the reality he has been living in: imprisoned inside of the asylum grounds with incurable schizophrenia inherited from his mother that has already departed from this world.

The introduction to the story up until the moment the character enters the castle will be shown in a cutscene. The vertical slice itself highlights only the part of the whole story, ending at the moment the Child is being caught by the nurse.

## 1.2 Testimony Where Metanoia Story is Based

It was the 80's and due to a judicial error I found myself on a winter night, in this old prison, when I arrived, I was placed in a 4 square meter cell with a hole in the floor for physiological needs and with a walled wooden board as my bed.

I was already scared, but everything was just beginning, because at night I was visited by three prison guards who wanted to have fun and amaze me a little more, with physical and mental torture, mentally I was healthy and consequently I was not surprised by the words, then they started beating me with objects that would not leave visible marks on my body. The final part of my first night was in the solitary, they left me there for 3 days, identical to the other, but on the first floor, where I tried everything, despite the pains to rest, but throughout the night I heard cries of despair from others that I could not see.

In the morning, I heard the noise of chains as if someone in chains walked through the corridors and at this moment I was under strong psychological pressure, crying

desperately with the desire to die, with my whole body that hurt, but above all I thought I was going crazy, I was left 3 days with just water and a little bread. The fear and panic grew, because from where I was, I heard what was going on in the basement where torture until the death of the prisoners happened, desperate screams, groans.

On the fourth day they opened this medieval cell and took me to a common bathroom where I was once again subjected to physical and mental violence, as they gave me a bath with a hose with a lot of pressure and the water seemed to break all my bones, so I sat on the floor and huddled as a form of defense until they were done.

Then, by a jailer, I was taken, passing through the outdoor space that was used for the air hours to a windowless room at the basement entrance, where I was still beaten up for my reaction with the jailer, because I didn't want to enter. Inside of the cell I met an old friend from junior school, he robbed one of the banks a couple of years before, and at that moment he was a friend of some guards.

He told me that most of the screams were from new inmates (cavalli). The cops went with them to the underground to have fun during the night. During the month I was in there, most of the violence came from the officers when they robbed my food or spanked me. This friend helped me by cooking, and my father usually gave me bread everyday.

Rocca Costanza is a dark place, I was in a safe position because I knew someone important there. But in other cases, cops killed prisoners and made it look like an accident...

### 1.3 Description

Metanoia is a game that is divided in 2 parts: the exploration of the environment and solving the riddles in order to advance to the other sections of the hospital.

Each interactable NPC will give a certain task to the player that involves bringing the right object. By giving the item, the player will suffer good or bad consequences, depending on whether the object fulfills the NPC's needs. This aspect is further developed in "2.4 NPC's section".



*Reference Images  
from Sergio Roman*

## 2. Gameplay

After opening the game, the player will be sent to the first screen of the game, showing the character getting into the hospital and a narration of the basic lore of Metanoia. The player starts free in one of the sections of Metanoia's world, and needs to complete tasks to progress through them.

As the player progresses, doing the tasks the Npc's ask, new sections of the world will be available to explore and understand more of the lore.



*Reference Images*

### 2.1 Camera

#### 2.1.1 In Game

The camera in Metanoia acts like the eyes of the player character, following the player and being able to rotate 360 degrees in X-axis and 160 degrees in Y axis.

The rotation of the camera in X-axis responds to the rotation of the character's body, and the rotation in Y-axis responds to the rotation of the head of the character, representing the movement of the neck and its limits.

#### 2.1.2 In Menu

In the Menu screens, the camera behaves as a cinematic camera, having specific waypoints around the game map and angles that it will follow. The specification for each waypoint can be found in [Link to 2.5 Interfaces], where each interface that fits the "In Menu" characteristics has a table about the camera's waypoints and angles.

## 2.2 Mechanics

This section defines the core and secondary mechanics of the game: the player's actions, the enemies' behaviour and the inventory.

### 2.2.1 Player Character

The playable character is a child with X, Y, Z scale in X, Y and Z axis. He is called "Child" by the inhabitants of the game. The Child's heartbeat is the core mechanic of the game. The heart beats define most of the gameplay as the player must control it while running away from the Shadows with the use of the pills. The Child also has an inventory with 1 slot.

- **Movement**

The player will move in the X and Z axis, with the speed of X. The player can't jump, this means that at any moment a Y force will be applied (expect gravity, -9.81 in Y).



*Design Team Sketch*

- **Actions**

The player character is able to perform a set of actions: pick up an object, use an object, talk to the NPC's.

- **Heartbeat:**

In Metanoia, the character's heartbeat acts as health points. It should neither be too high or too low to maintain the responsiveness of the character and avoid its death.

The heartbeat affects the movement of the player: the higher it is, the faster the player moves. This is represented by the formula below.

$$@playerMove = @initialSpeed * (@heartBeat / 110)$$

High and low heartbeat is dangerous to the player. Having it higher than 200 and lower than 50 cause death by heart attack and overdose respectively.

### 2.2.2 Items

In Metanoia, the player can gather items to control the heartbeat or to complete the tasks of the NPC's. No item will actively increase the attributes of the player, such as speed, strength, or others.

Metanoia has 2 different types of items, NPC-Related objects and pills. They can be found and collected by exploring the map.

Pills **cannot** be stored in the inventory, the player must take them at the moment of encounter or leave them in the place.

The items will be created as ScriptableObjects and with the function of CreateAssetMenu.



*Design Team Sketch*

Type	Item ID	Item Name	Consequence
Pill	RP	Red Pill	-10 heartBeat
Pill	BP	Blue Pill	-50 heartBeat

Type	Item ID	Item Name	Consequence
NPC-Related	Doc	Hospital Document	Finish Task
NPC-Related	Kni	Knife	Finish Task
NPC-Related	Lil	Lillies	Finish Task
NPC-Related	Sci	Scissors	Finish Task
NPC-Related	*Unknown*	*Unknown*	Finish Task
NPC-Related	*Unknown*	*Unknown*	Finish Task

### 2.2.3 Inventory

The inventory has only one slot, the items cannot stack. The main function of the inventory is to hold the items to deliver to the interactable NPCs. The inventory is visually represented by the rabbit the child carries with him.

The inventory's slot will be shown all the time in the UI of the game during the gameplay.



Design Team Sketch

### 2.2.4 Environment

Heartbeat rate influences the environment as well, the variable for heart beats per minute changes the environment elements (walls, objects) towards being taller and/or longer. The scale of the objects follows the formula and table below, the table describes which axis is influenced by the formula.

$$@wallMultiplicator = (@heartBeats - 80) * 0.1$$

Object Tag	Object ID	X	Y	Z
Wall	1	No	Yes	No
Floor	2	No	Yes	No
Lamp	3	No	Yes	No

## 2.2.5 Shadows (Enemies)

There are different enemies in Metanoia, the first one is the main character's shadow that will be spawned in the very beginning, as soon as the player enters the hospital. As the player fails the NPC's tasks, new enemies will appear. The enemies are shadows of the NPCs that will behave in a similar way, according to the generic state machine created for all of the shadows, but with certain differences and extra states to give life and personality to each shadow.

Enemies spot the player with the use of a cone trigger collider of 75% of the height of the enemy. If the player collides, it will activate the search state. If the enemies have lost the player, a timer will run, during which the enemies will abandon the chase and go towards the last known position of the player. The pyramid collider is rotated 90 degrees and has a scale of X. The scale changes according to the heartbeat of the player. The scale of the pyramid follows the formula below:

$$@pyramidScale = @initialPyramidScale * (@heartBeats/50)$$

All the enemies spawn in the predefined position of the level, this position is determined with an Empty object named "Player/Enemy StartPos" which is in the position X, Y, Z in both X, Y, and Z axis.

Shadows are **invisible** to the player, the player can only see them when they collide with the area of a light.

More technical information regarding the behaviour of each Enemy and their attributes is provided in the AI section. Below are the physical features of each shadow and their positioning.

- **Player's Shadow :**

The player's shadow spawns after the player collides with a trigger in the position X, Y, Z with scale X, Y, Z in both X, Y, and Z Axis.

The Player's shadow has a scale of X, Y, Z in both X, Y, and Z axis



- **Rabbit's Shadow**

The Rabbit's shadow spawns, in the position X,Y,Z in both X,Y, and Z axis, as the player fails his task, it has a scale X, Y, Z in both X, Y, and Z axis.



- **Koala's Shadow**

The Koala's shadow spawns, in the position X,Y,Z in both X,Y, and Z axis, as the player fails his task, it has a scale X, Y, Z in both X, Y, and Z axis.



- **Deer's Shadow**

The Deer's shadow spawns, in the position X,Y,Z in both X,Y, and Z axis, as the player fails his task, it has a scale X, Y, Z in both X, Y, and Z axis.

- **Lion's Shadow:**

The Lion's shadow spawns, in the position X,Y,Z in both X,Y, and Z axis, as the player fails his task, it has a scale X, Y, Z in both X, Y, and Z axis.



- **Cat's Shadow:**

The Cat's shadow spawns, in the position X,Y,Z in both X,Y, and Z axis, as the player fails his task, it has a scale X, Y, Z in both X, Y, and Z axis.



- **Fox's Shadow:**

The Fox's shadow spawns, in the position X,Y,Z in both X,Y, and Z axis, as the player fails his task, it has a scale X, Y, Z in both X, Y, and Z axis.



Reference Images

## 2.3 Lights

Metanoia has areas in which the shadows turn visible for the player. These areas are: natural and artificial lights. Both have the same effect on shadows. The gameplay takes place at nightfall and thus there will be light from the dawning sun coming through the castle windows. This light is considered a natural light.

The areas are trigger colliders that the player sees as natural light from windows and artificial light as lamps and candles. More detailed information is in the table below.

ID	Name	Type of Light	Collider	Type	Range	Position	Rotation
1	Light01	Artificial Lights	Cylinder	Point	190	(X, Y, Z)	(X, Y, Z)
2	Light01	Artificial Lights	Cylinder	Point	190	(X, Y, Z)	(X, Y, Z)
3	Light01	Artificial Lights	Cylinder	Point	190	(X, Y, Z)	(X, Y, Z)
4	Sun01	Natural Lights	Cube	Spot	190	(X, Y, Z)	(X, Y, Z)
5	Sun01	Natural Lights	Cube	Spot	190	(X, Y, Z)	(X, Y, Z)
6	Sun01	Natural Lights	Cube	Spot	190	(X, Y, Z)	(X, Y, Z)
7	Candle01	Natural Lights	Circle	Spot	100	(X, Y, Z)	(X, Y, Z)
8	Candle01	Natural Lights	Circle	Spot	100	(X, Y, Z)	(X, Y, Z)

- **Artificial Lights**

The artificial lights like electric lamps have logic to be balanced, and increase the feeling of reality to the player. The artificial lights flicker, turn on and off according to the situation the player faces. In the following table there are the specifications of behavior.

ID	Natural State	Situation	Behavior
1	On/Off	Mission Success	On
2	On/Off	Mission Done/Shadow Spawns	Flicker
3	On/Off	Mission Success	On

- **Natural Lights**

Natural light from the dawning sun and candles is always present. Sunlight has a ray-like appearance coming from the windows of the castle. It is never affected by the in-game situations and therefore it is rare: this kind of light only exists in certain rooms where the player is expected to traverse more freely.

A more detailed information regarding the implementation of the lights, shaders used and the specific lighting needs is provided in 4.2 Lighting of Graphics section.

## 2.4 NPCs

There are 3 types of NPCs in Metanoia, 2 of which will follow the same logic in the game. The NPCs types are: “People”, “Friendly Imaginary Friends”, and “Hostile Imaginary Friends”.

### 2.4.1 Static NPC:

- **People (PEO):**

Static NPCs around the map, they are workers inside the hospital, they have the objective of populating and giving a sense of reality to the player, interacting only by saying some phrases whenever the player is nearby. They are static in their position, doing their job or just idling, each PEO has a scale X, Y, Z in both X, Y, and Z axis.



Reference Images

### 2.4.2 Dynamic NPC:

Dynamic NPC's (FIF and HIF) tasks depend on their needs. They are direct in their tasks (i.e. they ask to bring a specific object), while others only convey their desires through some of the background story, letting the player decide what kind of object they require. If the player brings the correct item, the consequences described below will happen.

- **Friendly Imaginary Friends (FIF):**

Dynamic NPCs running around the map, they are the ones that will give tasks for the player and be able to go to the next level. Friendly NPCs say sentences to the player to call his attention, this is the way for the player to find him and have his attention. The friendly have masks of prey animals, and give a simple task to the player.

In the case of the Friendly NPCs, the player must give the **correct** item to the NPC to not suffer the consequence of new shadow spawning and the increase of the heart beat, each FIF has a scale X, Y, Z in both X, Y, and Z axis.

The tasks are described in the table below.

- **Hostile Imaginary Friends (HIF):**

Dynamic NPCs running around the map, they are the ones that will give tasks for the player and be able to go to the next level. Hostile NPCs say sentences to the player to call his attention. The HIF have masks of predator animals, they give a riddle to the player as a task. Their speech and the riddle content will give away that they must not be trusted and their tasks must not be completed in the same way as FIF.

In the case of the Hostile NPCs, the player must give the **wrong** item to the NPC to not suffer the consequences of new shadow spawning and the increase of the heart beat, each HIF has a scale X, Y, Z in both X, Y, and Z axis.

The tasks are described in the table below.

NPC ID	Path ID	Name	Item Requested	NPC Type
1	1	Rabbit	Book	FIF
2	2	Koala	Flower	FIF
3	3	Deer	*Not Yet Decided*	FIF
4	4	Lion	Knife	HIF
5	5	Cat	Scissors	HIF
6	6	Fox	*Not Yet Decided*	HIF
7	N/A	Nurse	N/A	PEO
8	N/A	Janitor	N/A	PEO
9	N/A	Office	N/A	PEO

#### 2.4.3 Tasks/Riddles

NPC ID	Taks/Riddles
1	I loved when people read me stories to sleep...
2	Flowers used to make me happy...
3	*Not Yet Decided*
4	If you open a kitchen drawer This is something that you might see Smaller ones are used to cut your food And larger ones to carve turkey
5	This item has handles But it isn't a car It also has two blades But isn't a razor
6	*Not Yet Decided*

## 2.4.4 Dialogue Script

NPC ID	Sentence
7	If you are sick again, search for a doctor...
7	CAN YOU SEE THAT I'M READING?
7	Last time a child bothered me... Well, no one knows where he is now...
7	Hm...
7	BE QUIET
7	Child, may i hurt or will you just move...?
7	I have collections of children's nails...May I see yours?
7	God, being here is so lonely
7	You are not a bad kid, just a sad and sick child.
7	I used to be very happy, my husband was jailed here... I got here only to see him, and now... I can't leave.
8	I'm here just for the payment, only here I can help my family
8	You know? Life is not bad, but living inside our dreams is
8	Sometimes I see blood, I don't really know where it came from...
8	Just keep cleaning, just keep cleaning! Cleaning... Cleaning!
8	Don't worry, the Officer didn't make this scar, was life that did this to me
8	I'm kinda confused why you are here, but who am I to ask? I'm just a janitor
8	Hello Little One!
8	God, I miss my child, I must be here for more 3 weeks to go home and rest...
8	If you were more than 21 years old, I would invite you to a beer, you look like a nice child.
8	Do you need any help? Search for room 2B, there is a map there to help.
9	Have you met Jean? God... I tortured him... Was so good...
9	It's always like that, nothing more than an amazing stay and fun FOR BOTH OF US...
9	Do you prefer the hand or the foot?
9	What type of bath do you like?

9	Are you sure you are going there... Alone?
9	I do like to play with childs... I used to torture them
9	Handcuffs are an interesting instrument to use...
9	I know smells that you may have...
9	I think some years ago, I treated your dad... Unfortunately he managed to escape.
9	Want to see something fun? Go to the treatment room, it's my playground

## 2.5 Interface

There are 7 main screens/popups in Metanoia:

1. Starting Screen
2. Main Menu
3. Options Menu
4. Credits Menu
5. Pause Menu
6. Option Menu In-Game
7. Gameplay Screen

### 2.5.1 Starting Screen



- **Logo:**

Logo has the position 0, 0 in both X and Y axis. The Scale is 610, 240 in both X and Y axis. Logo uses the image "Metanoia\_Logo\_White".

- **Press Any Button:**

Press Any Button has the position 0, -160 in both X and Y axis. The scale is 240, 30 in both X and Y axis. Press Any Button use the font X with Best Fit activated, and use the function “MenuFunction.ToMainMenu”.

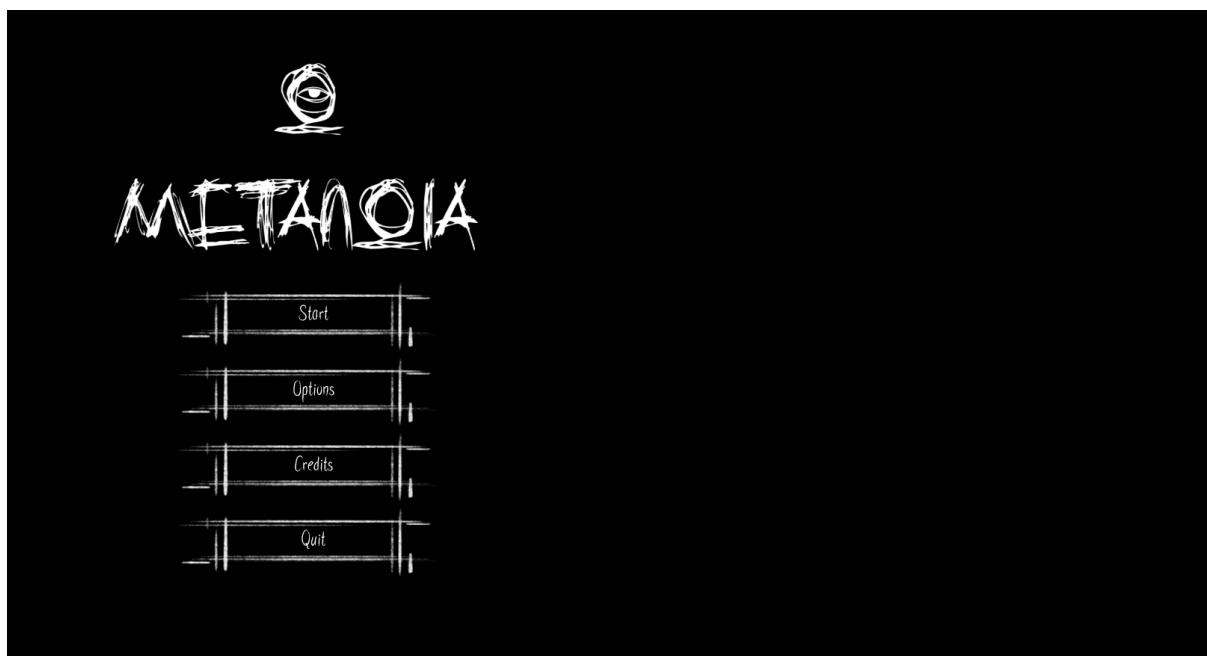
- **Camera:**

For the Starting Screen, we have a cinematic camera going through waypoints to have a better looking Background. The waypoints and angles are shown in the following table.

Point 1	Point 2	Point 3	Point 4	Point 5	Point 6	Point 7	Point 8
(X,Y,Z)							

Angle 1	Angle 2	Angle 3	Angle 4	Angle 5	Angle 6	Angle 7	Angle 8
(X,Y,Z)							

## 2.5.2 Main Menu



- **Logo:**

Logo has the position -200, 120 in both X and Y axis. The scale is 353.8594, 139.2234 in both X and Y axis. Logo uses the image “Metanoia\_Logo\_White”.

- **Start:**

Start has the position -200, 20 in both X and Y axis. The scale is 171.0732, 48.71966 in both X and Y axis. Start uses the image “UI\_BackButton” and uses the function MenuFunction.Start.

- **Options:**

Options has the position -200, -30 in both X and Y axis. The scale is 171.0732, 48.71966 in both X and Y axis. Options use the image “UI\_BackButton” and uses the function MenuFunction.Option.

- **Credits:**

Credits has the position -200, -80 in both X and Y axis. The scale is 171.0732, 48.71966 in both X and Y axis. Credits use the image “UI\_BackButton” and uses the function MenuFunction.Credits.

- **Quit:**

Quit has the position -200,-130 in both X and Y axis. The scale is 171.0732, 48.71966 in both X and Y axis. Credits use the image “UI\_BackButton” and uses the function MenuFunction.Quit.

- **Camera:**

For the Main Menu, we have a cinematic camera going through waypoints to have a better looking Background. The waypoints and angles are shown in the following table.

Point 1	Point 2	Point 3	Point 4	Point 5	Point 6	Point 7	Point 8
(X,Y,Z)							

Angle 1	Angle 2	Angle 3	Angle 4	Angle 5	Angle 6	Angle 7	Angle 8
(X,Y,Z)							

### 2.5.3 Options Menu



- **Logo:**  
Logo has the position -200, 120 in both X and Y axis. The scale is 353.8594, 139.2234 in both X and Y axis. Logo uses the image “Metanoia\_Logo\_White”.
- **Music:**  
The button serves a simple purpose to change the volume of the background music. Music button has the position -160, 20 in both X and Y axis, the scale is 318.7668, 64.32888 in both X and Y axis. Music uses the image “UI\_BackButton” & “UI\_FrontFace”.
- **Sound Effect:**  
This button is used to change the volume of the sound effects in the game. Sound Effect button has the position -160, -20 in both X and Y axis, the scale is 318.7668, 64.32888 in both X and Y axis. Sound Effect uses the image “UI\_BackButton” & “UI\_FrontFace”.
- **Difficulty:**  
The team aims to implement 3 levels of difficulty for the game. The difficulty is defined by how impactful certain situations will be for the player: by how much the heartbeat will be raised in a stressful situation and how fast and attentive the shadows will behave. The team considers making the difficulty of the riddles for the tasks scale with the difficulty level picked in this option.

Difficulty	Shadows attention time multiplier	Heartbeat increase multiplier	Riddles difficulty (under consideration)
Little kid	0.1	0.1	Very easy (primary school level)
to be defined	0.3	0.3	Normal (secondary school level)
to be defined	0.6	0.6	Hard (mysterious riddles that require some brainstorming)

Difficulty button has the position -160, -60 in both X and Y axis. The scale is 318.7668, 64.32888 in both X and Y axis. Difficulty use the image “UI\_BackButton” and uses the function MenuFunction.ChangeDifficulty.

- **Back:**

Back has the position -204, -100 in both X and Y axis. The scale is 140.45, 46.34592 in both X and Y axis. Credits use the image “UI\_BackButton” and uses the function MenuFunction.ToMainMenu.

- **Camera:**

For the Option Menu, we have a cinematic camera going through waypoints to have a better looking Background. The waypoints and angles are shown in the following table.

Point 1	Point 2	Point 3	Point 4	Point 5	Point 6	Point 7	Point 8
(X,Y,Z)							

Angle 1	Angle 2	Angle 3	Angle 4	Angle 5	Angle 6	Angle 7	Angle 8
(X,Y,Z)							

## 2.5.4 Credits Menu



- **Logo:**

Logo has the position 0, 149 in both X and Y axis. The scale is 353.8594, 139.2234 in both X and Y axis. Logo uses the image “Metanoia\_Logo\_White”.

- **Credits:**

Credits has the position 0, -30 in both X and Y axis. The scale is 583.9156, 273.2624 in both X and Y axis. Logo uses the image “UI\_BackButton”.

- **Back:**

Back has the position -348.46, -200.88 in both X and Y axis. The scale is 103.0725, 48.23619 in both X and Y axis. Credits use the image “UI\_BackButton” and uses the function `MenuFunction.ToMainMenu`.

- **Camera:**

For the Option Menu, we have a cinematic camera going through waypoints to have a better looking Background. The waypoints and angles are shown in the following table.

Point 1	Point 2	Point 3	Point 4	Point 5	Point 6	Point 7	Point 8
(X,Y,Z)							

Angle 1	Angle 2	Angle 3	Angle 4	Angle 5	Angle 6	Angle 7	Angle 8
(X,Y,Z)							

## 2.5.5 Pause Menu



- **Panel:**  
Panel has the position 0, 0 in both X and Y axis. The scale is 800 449.8645 in both X and Y axis. Panel has a RGBA 0,0,0,175 in both red, green, blue, and alpha.
- **Logo:**  
Logo has the position -200, 120 in both X and Y axis. The scale is 353.8594, 139.2234 in both X and Y axis. Logo uses the image "Metanoia\_Logo\_White".
- **Resume:**  
Resume has the position -200, 20 in both X and Y axis. The scale is 247.2421, 46.3578 in both X and Y axis. Start uses the image "UiResume" and uses the function StopTime.Resume.
- **Options:**  
Options has the position -200, -30 in both X and Y axis. The scale is 247.2421, 46.3578 in both X and Y axis. Options use the image "UiOptions" and uses the function MenuFunction.Option.
- **Main Menu:**  
Main Menu has the position 0, -80 in both X and Y axis. The scale is 247.2421, 46.3578 in both X and Y axis. Main Menu use the image "UiMainMenu" and uses the function MenuFunction.ToMainMenu.

## 2.5.6 In-Game Options Menu



- **Logo:**

Logo has the position -200, 120 in both X and Y axis. The scale is 353.8594, 139.2234 in both X and Y axis. Logo uses the image "Metanoia\_Logo\_White".

- **Music:**

Music has the position -160, 20 in both X and Y axis, the scale is 318.7668, 64.32888 in both X and Y axis. Music uses the image "UI\_BackButton" & "UI\_FrontFace".

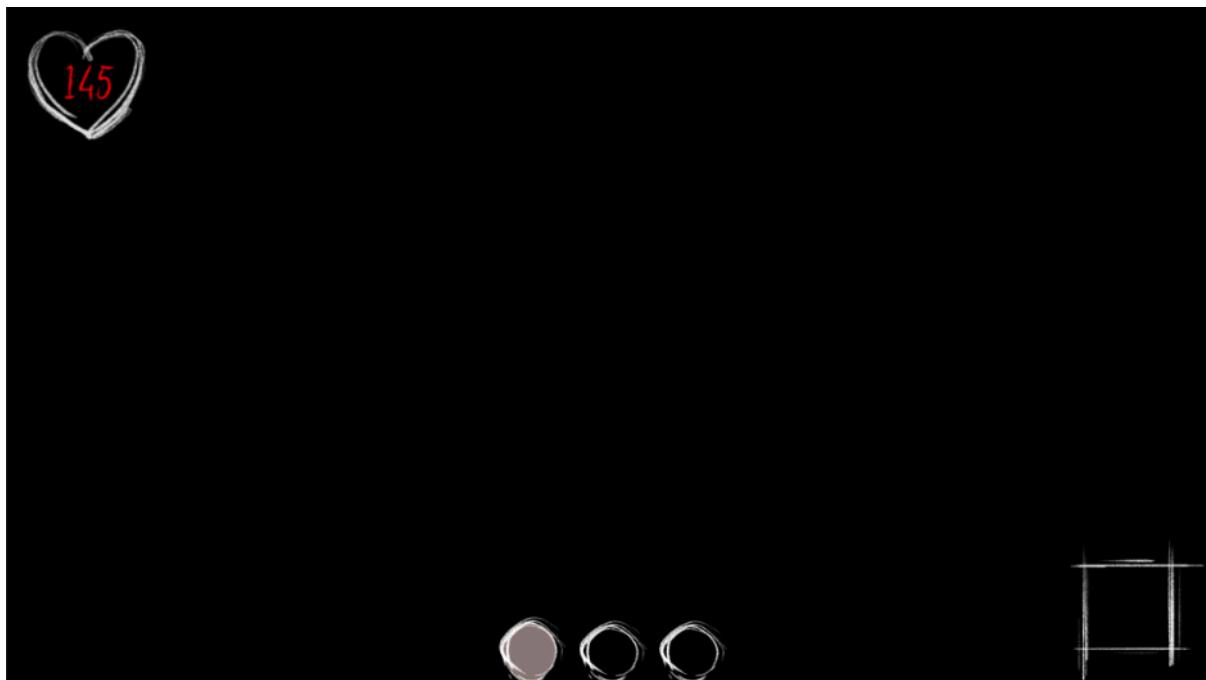
- **Sound Effect:**

Sound Effect has the position -160, -20 in both X and Y axis, the scale is 318.7668, 64.32888 in both X and Y axis. Sound Effect uses the image "UI\_BackButton" & "UI\_FrontFace".

- **Back:**

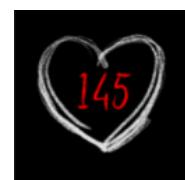
Back has the position -204, -60 in both X and Y axis. The scale is 140.45, 46.34592 in both X and Y axis. Credits use the image "UI\_BackButton" and uses the function `MenuFunction.ToPauseMenu`.

## 2.5.7 Gameplay Screen



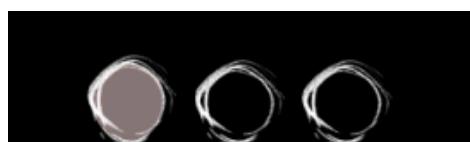
- **HeartBeat:**

HeartBeat has the position -345, 176 in both X and Y axis. The scale is 81.75072, 81.75072 in both X and Y axis. HeartBeat uses the image “UI\_Heart\_03”.



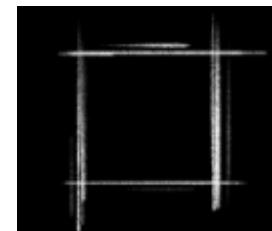
- **Tasks:**

Tasks has the position 0, -157.7 in both X and Y axis. The scale is 135.88284, 45.29428 in both X and Y axis. Tasks uses the image “UI\_Light\_Off” and “UI\_Light\_On”.



- **Inventory:**

Inventory has the position 350, -175 in both X and Y axis. The scale is 100, 100 in both X and Y axis. Inventory uses the image “UI\_Inventory\_Slot”.



## 3. AI & Behaviour

Artificial Intelligence in Metanoia involves the implementation of pathfinding and finite state machines. Each NPC and enemy type has its own behaviour.

### 3.1 Enemies

Every shadow is spawned at the entrance to the section of the hospital the player is currently in, from which it proceeds to patrol a certain area of its own. The states of the enemies include: patrol, chase, search and attack. Some of the enemies have additional states within these general states.

Below you will find the table depicting the transitions between each of these states.

#### 3.1.1 States

- **Patrol**

Patrol is the initial state of each shadow. It follows a set of waypoints around a defined area and can only go outside of it if the player is inside of chase range.

- **Chase**

The shadow will tilt towards the player character, ignoring the waypoints, but respecting the collisions with the elements. It will chase the player until he is caught or lost from its sight.

- **Search**

If the player escapes, the shadow will idle for a set amount of time “searching” for the player in the last seen position. It will move towards the closest waypoint afterwards, returning to patrol state.

- **Attack**

If the player spends too much time within the chase range uninterruptedly, the shadow will transit to the attack state. This will trigger the shadow object to cling to the player, depleting its HP quickly - in this case, raising its heartbeat by 20 every second until the Child collapses.

**General States Transition Table:**

Initial State:	Condition(s):	Next State:
Patrol	<ul style="list-style-type: none"> <li>● Player within range of vision <u>AND/OR</u></li> <li>● Heartbeat above 120 AND within the pathfinding area</li> </ul>	Chase

Chase	<ul style="list-style-type: none"> <li>Player outside of chase range</li> <li><u>AND</u></li> <li>Heartbeat below 120 OR outside of Vision area</li> </ul>	Search
Chase	<ul style="list-style-type: none"> <li>Player within the chase range for 10sec. or longer</li> </ul>	Attack
Search	<ul style="list-style-type: none"> <li>Timer for searching state has elapsed AND all the conditions above are false</li> </ul>	Patrol

### 3.1.2 Player's Shadow

Spawned in the beginning of the game, this enemy's behaviour is intended to be as close as possible to the behaviour of a real child. When patrolling, its waypoints are spread randomly around the reception and main hall area and will be changing over time within the same area to create an image of an unpredictable creature. This shadow is easily distracted and is in general more energetic than others.

#### Attributes:

Range of vision	Chase range	Chase-to-Attack timer	Search timer	Speed
6	to be defined	6	4	4

$$@SearchTime = (@VisionRange * @Speed) / @ChaseToAttack$$

The path of the shadow is random based on the vertices in disposal to move. If it sees the player it will move with him as a goal, if the player runs out of its vision area the shadow will go to the player position at that moment and restart the randomness in its movements.

#### Player's Shadow WayPoints:

Point 1	Point 2	Point 3	Point 4	Point 5	Point 6	Point 7	Point 8
(X,Y,Z)							

### 3.1.3 Imaginary Friends' Shadows

Imaginary friends' shadows slightly differ among each other in their attributes. The attributes are adjusted to match the behaviour of an animal they represent. Unlike the player's shadow, most of these shadows have a predetermined map of waypoints they will

follow, focused mostly around the area of the first encounter. The patterns of each animal's behaviour and their waypoints will be described below.

### 3.1.3.1 FIF

Friendly imaginary friends are still prey and they will, in general, be easier to escape. They are, however, not easy to spot as their waypoints usually avoid spots of light.

- **Rabbit**

This is an energetic shadow. Its movement is fast enough for it to move from one waypoint to another in less than one second. The movement itself is jump-like, meaning, this shadow will not be crossing the floor itself and the vision range is limited to the area around the waypoint it is currently in.

- **Koala**

Koala is the most passive shadow. In its patrolling state, it has a sleeping period that triggers every 3rd waypoint it has passed. It will stay asleep for 10 seconds before proceeding to its path. While asleep, it is unable to detect the player, unless his heartbeat is above 150bpm. The movement of this shadow is also slow and on average it takes from 5 to 8 seconds to move from one waypoint to another.

*Extra State: Asleep. Triggers every 3rd waypoint during Patrol state.*

- **Deer**

Deer is a fast-moving shadow that also spends 3 seconds at the waypoint, idling and looking around.

*Extra State: Search. Triggers every time a waypoint is reached during Patrol state.*

**Attributes:**

FIF	Vision Range	Chase range	Chase-to-Attack timer	Search timer	Speed
Rabbit	3	to be defined	6	4.5	9
Koala	5	to be defined	10	2	4
Deer	6	to be defined	4	3	2

$$@SearchTime = (@VisionRange * @Speed) / @ChaseToAttack$$

**FIF's Shadows WayPoints:**

FIF	Point 1	Point 2	Point 3	Point 4	Point 5	Point 6	Point 7	Point 8
Rabbit	(X,Y,Z)							
Koala	(X,Y,Z)							
Deer	(X,Y,Z)							

### 3.1.3.1 HIF

Hostile Imaginary friends are harder to escape as they represent predator animals. Some of these shadows have stealth patterns that allow them to deceive the player by hiding in a dark spot and assaulting him unexpectedly.

- **Lion**

Lion is a fast shadow, patrolling its area slowly and not hiding itself from the player. It is very territorial and the range of its vision is extended, compared to the other predators. This is the only shadow that lurks around the whole castle's map, even after the new sections have been opened by the player.

- **Cat**

Cat has a medium speed of movement, however, it excels at hiding itself. Once the player spots this shadow, it will move to the dark area of the map and await for the player to come closer to chase. If the player moves away, the cat returns to patrolling. Its chase state, therefore works differently:

*Extra State: Hide. Triggered whenever the player is in the range of vision and the shadow is visible to him due to it crossing the sunlit spots. Transits to actual chasing if the player enters the chase range.*

- **Fox**

Fox is a fast shadow that is hard to escape from. It has a standard state machine, however, once it enters the search state, it will walk 50 meters further towards the direction the player has escaped in order to search for him.

**Attributes:**

HIF	Vision Range	Chase range	Chase-to-Attack timer	Search timer	Speed
Lion	5	to be defined	4	7.5	6
Cat	7	to be defined	6	4.6	4
Fox	8	to be defined	5	4.8	3

$$@SearchTime = (@VisionRange * @Speed) / @ChaseToAttack$$

HIF	Point 1	Point 2	Point 3	Point 4	Point 5	Point 6	Point 7	Point 8
Lion	(X,Y,Z)							
Cat	(X,Y,Z)							
Fox	(X,Y,Z)							

## 3.2 Characters/Dynamic NPC

This section describes the behaviour of the Non-Playable Characters in the game. The state machine includes strolling around the castle, idling, talking and performing animal-related actions.

### 3.2.1 States

All of these states, except for talking, are timer-controlled and will be performed automatically once the timer is up.

- **Idling:**

In this state, the NPC stands still at one of the waypoints of his pathfinding map. It will automatically turn its head towards the player, when the player is within the same room.

- **Strolling:**

The NPC goes through the waypoints, looking around him and/or singing or making noises from his footsteps.

NPC ID	Path ID	Position 1	Position 2	Position 3	Position 4	Position 5	Position 6
1	1	(X, Y, Z)					
2	2	(X, Y, Z)					
3	3	(X, Y, Z)					
4	4	(X, Y, Z)					
5	5	(X, Y, Z)					
6	6	(X, Y, Z)					

- **Talking:**

Triggered when the player interacts with the NPC from any state it is currently in. This will prompt a dialogue with the player.

- **Performing action:**

Triggered by a randomized timer in the range between 40 to 120 seconds, the NPC will perform an action related to the animal on its mask.

### General States Transition Table:

Initial State:	Condition(s):	Next State:
Idling	Timer between 40 and 120 seconds has elapsed	Action
Action	Action animation finished	Idling

Idling	Timer between 60 and 240 seconds has elapsed	Strolling
Strolling	Timer between 40 and 120 seconds has elapsed, goes to the closest waypoint	Idling
Any	Player has interacted	Talking
Talking	Player has exited dialogue	Any

**Action per Imaginary Friend Table:**

Imaginary Friend:	Action:
Rabbit	Biting a carrot
Koala	Doozing
Deer	Looking around anxiously
Lion	Roaring
Cat	Licking its paw
Fox	Sniffing the air

### 3.3 Hospital inhabitants/Static NPC

Static NPC always remain at the same spot, motionless. Whenever the player enters the room they are in, they will produce a phrase, related to the player or the overall environment. There is no state machine as such as the only state they encounter themselves in is idling.

The phrases they say are randomized with the priority to unsaid ones. The timer for speaking ranges between 60 and 240 seconds, provided the player is still in the same location as the NPC.

Upon reaching the limit of the array of audio files, the same replica can't play again. There is a randomizer that will get a number from X to Y, if the number gets under Z, the audio will play and update the value of the index.

*Example:*

```
public AudioClip[10] audioSource
public int randomNumber;
public int index = 0;

private void OnCollisionEnter(Collision collision)
{
    randomNumber = Random.Range(0, 51)
    if(randomNumber <= 10){
        audioSource[index].Play();
        index += 1;
```

```
    }
else
{
index=0
audioSource[index].Play;
}
```

## 4. Graphics

This section contains technical information regarding the implementation of graphics in Metanoia: the shaders used, lighting aspects and the preferred rendering pipelines. For the artstyle and animations, consult section 6, “Art & Animations”.

### 4.1 Rendering

For the rendering pipeline, the team plans to use the Unity prebuilt Universal Render Pipeline (URP), as it allows decent customization and optimization for the final result.

#### 4.1.2 Shaders

Non-Physically Based Rendering (PBR) offered by URP is the most suitable option for the project as, despite the artstyle being low-poly and unrealistic, the lights still require realistic behaviour. SimpleLit is the shader that fits the goals of the team in terms of keeping the realistic lighting and a good performance at the same time.

Besides SimpleLit used for the majority of surfaces and lighting, the team might need additional shaders for:

- **Shadows (enemies)**

The shadows that haunt the player need to look distinct compared to the overall dark environment whether by being completely black or by having an outline with the emission effect on it. They also need to have a floaty and smooth feeling to their bodies despite the graphics of the game world being “sharp”. The team considers implementing a custom shader for the enemy shadows, if the URP’s Unlit shader will not achieve the needed effect.



*Reference image taken from another project*



*Reference image taken from another project*

- **Candle flames**

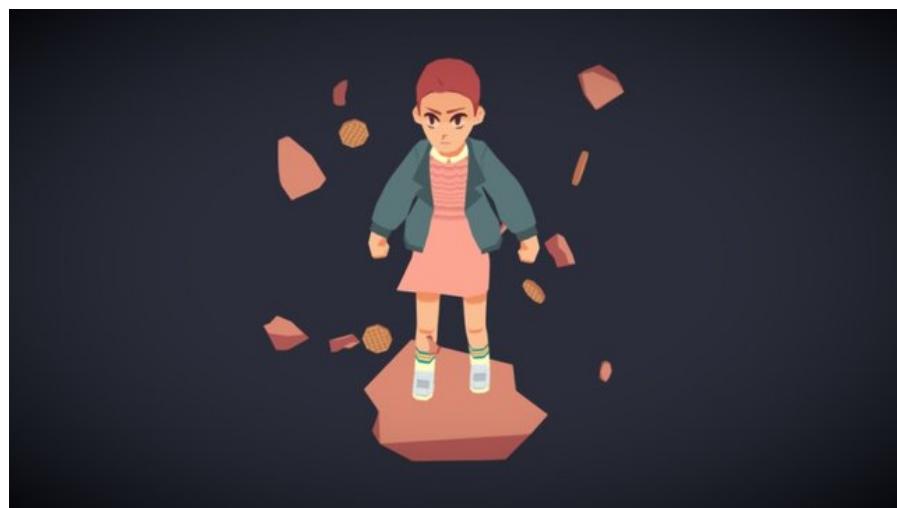
The candle flames are a special kind of light source that helps the player when the electric lights go out. The team aims to achieve the realistic candle flames behaviour with the light emitted by them being realistically unstable and the lightened areas always changing/dragging according to the flames' behaviour. The light also needs to be dusk, yet reasonably bright for the player to be able to navigate without difficulties. Particles Lit Shader might be used to achieve these goals.



*Reference images taken from another project*

- **Flat-shaders (*under consideration*)**

Still under consideration as the implementation of the flattening technique depends highly on the first low-poly models' results made by the design team. In case the team sees this technique fit to the project, the flattening shader will be applied to all of the characters and significant objects like pills and quest-related items. To achieve this, the Geometry Shader in URP can be applied.



*Reference image taken from another project*

#### 4.1.3 Materials & Textures

The project requires a number of materials and textures applied to different kinds of surfaces. Below is the general information regarding the existing surfaces in the game that will need their own configuration for materials and distinct textures.

Item/Surface	Brief description
Floor	Castle-like brick seamless textures needed, light reflection (emission effect) in the areas with natural lighting.
Walls	Changing from brick textures to hospital walls as the game progresses. Like the floors, the light reflection is applied here for the natural lighting.
Plants	Only exist outside of the castle walls, used as scenery. Vivid colors with little to no realism in the texture.
Pills	Gloss texture, colors vary distinctly depending on the pill type.
Doors	Depending on how far the player has progressed, the doors can be wooden, according to the castle thematic and metallic, that correspond to the hospital theme.
Beds	The player will only encounter hospital beds in some of the rooms. Metallic carcas with standard blue/green cover. Slight emission effect when under the light.
Books	There are various books in the game. Material is unique for all, however the texture colors differ.
Castle-themed furniture	Old and wooden, textures do not need to be realistic but must convey the feeling of the ancient castle.
Hospital-themed furniture	Modern and simplistic. More realistic representation than that of the castle-themed furniture.
Medical items	Metallic texture. Material must emit light and be shiny.

## 4.2 Lighting

Lighting plays a huge role in the game as it is one of the main aspects that create an immersive experience and a horror atmosphere. In Metanoia, there are three sources of light - electric lamps candles and the natural light from the dawning sun, the rest of the castle perimeter is covered in dusk. There are also shadows cast from the objects and characters.

### 4.2.1 Light sources

- **Electric lights**

Type: Point

Color: White

Intensity: Between 2 and 5

Shadow Type: Hard Shadows

Overall description: Electric lights are lamps, located in every room of the castle. They are dynamic lights that behave differently depending on the situation the player is in. For failing one of the tasks, the lights will go flickering for some time before eventually turning off. When the lights are on, they only cover certain areas of the environment (i.e. one lamp cannot lighten up the whole room).

- **Candles**

Type: Spot

Color: Warm yellow

Intensity: 2

Shadow Type: Soft Shadows

Overall description: Candles are always on, independent of the electric lamps behaviour.

There are planned to be about 2 to 4 candles per room. When the main lights go off, candles will be there to light up small areas of the room and help the player to navigate.

- **Sunlight**

Type: Directional

Color: Cold yellow/orange

Intensity: 1.5

Shadow Type: Soft Shadows

Overall description: The sunlight exists in some areas of the castle. The team aims to achieve a sunshaft/god-ray effect, with much less brightness than that of a normal shaft effect, as this light comes from the dawning sun.



To achieve a magical effect, the team plans to implement the particle system of the dust/light particles in the sunlight rays. Some of the main items of the approximate configuration for the particles is as follows:

Looping: True

Max Particles: 100

Shape: Cone

Emission: Enabled

Start Lifetime: 8

Start Speed: 2

There are other light sources that are to be implemented as a part of the scenery and do not influence the mechanics of the game directly. The Light Mode for is set to Baked as there is no need to change the lighting in any way during the gameplay.

Below is the table prepared for the future lights implementation.

ID	Spot An.	Color	Mode	Intensity	Shadow T.	Render Mode	Mask
1	60	(R,G,B,A)	Baked	13.54	Soft/Hard	Auto	All
2	60	(R,G,B,A)	Baked	13.54	Soft/Hard	Auto	All
3	60	(R,G,B,A)	Baked	13.54	Soft/Hard	Auto	All
4	60	(R,G,B,A)	Baked	13.54	Soft/Hard	Auto	All
5	60	(R,G,B,A)	Baked	13.54	Soft/Hard	Auto	All
6	60	(R,G,B,A)	Baked	13.54	Soft/Hard	Auto	All
7	60	(R,G,B,A)	Baked	13.54	Soft/Hard	Auto	All
8	60	(R,G,B,A)	Baked	13.54	Soft/Hard	Auto	All

#### 4.2.2 Shadows



Shadows are an essential element of the in-game graphics. Shadows are enabled for every light source. To save the rendering memory, the team's goal is to use the most optimal values for the shadows configuration:

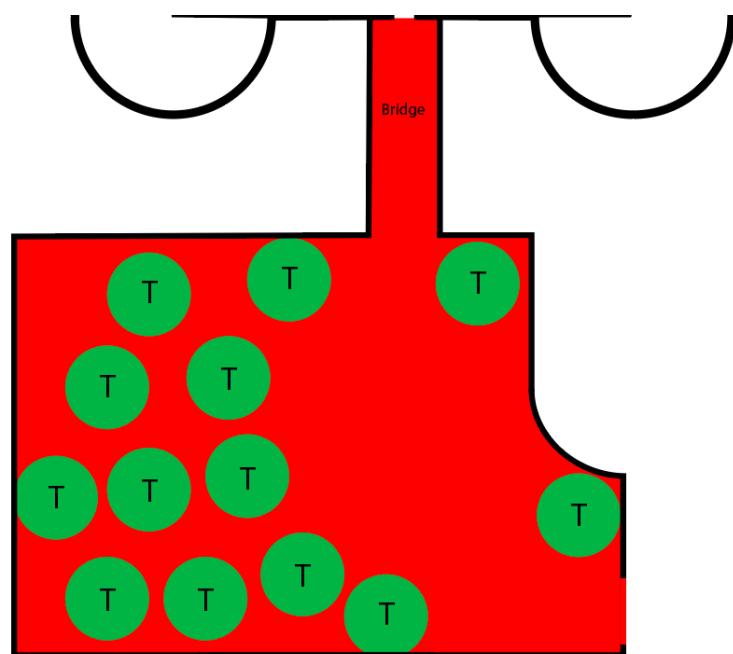
- The distance property will most probably contain the value between 30 and 50 meters;
- “Two Cascades” will be initially selected for the Cascades property. In case of performance issues, this value will be changed to “None”;
- “Low Dynamic Range” will be applied for the Grading Mode.

Additional points will be added as the team starts the production phase.

## 5. Level Design

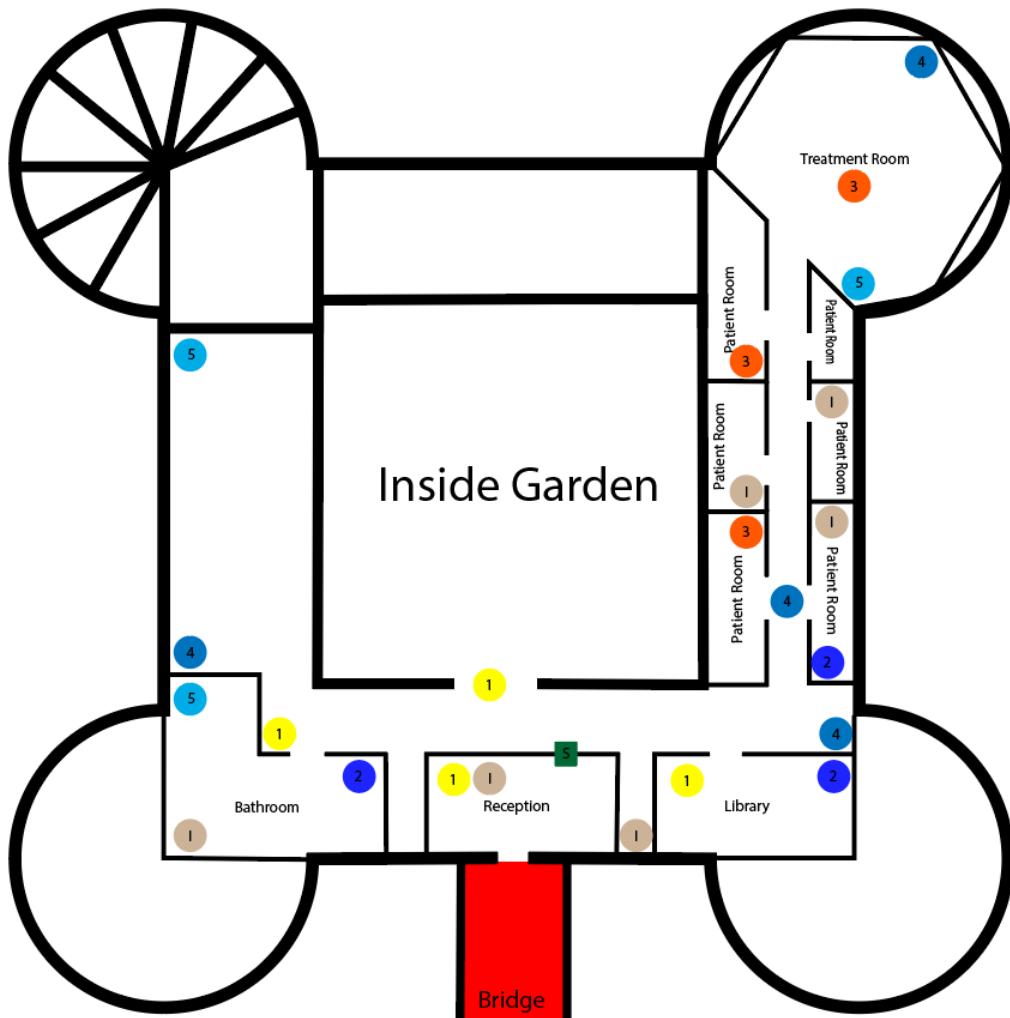
The environment Metanoia is based on Rocca Costanza, a castle in Italy that worked as a psychiatrist facility for 157 years. The castle was divided in 2 parts for the demo, the outside where a brief introduction of mechanics and lore happens and the inside where most of the gameplay is situated.

### 5.1 Outside



- T:  
Trees

## 5.2 Inside



- **Number 1 - People(PEO):**

A static NPC that has the main objective of populating the hospital. It's a human that introduces people to the hospital. The NPC has the Position X, Y , Z in both X, Y and Z axis.

- **Number 2 - Friendly Imaginary Friends (FIF):**

A dynamic NPC walking around the map and requesting items to the player. The specific position of each FIF is not yet defined. More information can be found in 2.4.2 Dynamic NPC

- **Number 3 - Hostile Imaginary Friends (HIF):**

A dynamic NPC walking around the map and requesting items to the player. The specific position of each FIF is not yet defined. More information can be found in 2.4.2 Dynamic NPC

- **Number 4 - Red Pill:**

An item that helps the player control the Heart Beats lowering in 10 the heartbeats in the moment.

- **Number 5 - Blue Pill:**

An item that helps the player control the Heart Beats lowering in 50 the heartbeats in the moment.

- **Letter I:**

Item the NPC request to fulfill the mission. The item position is not defined. Further information can be found in 2.2.2 Items

- **Letter S:**

Trigger collider making the first shadow (Player's Shadow) spaw in the map.

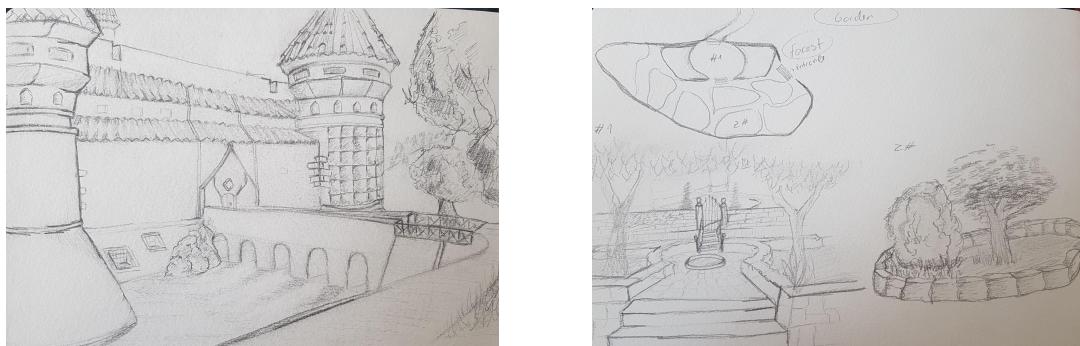
## 6. Art & Animations



As the game features low-poly graphics, with little realism to the characters and enemies, the artstyle is intended to convey the little child's imagination and add an element of surprise when the player encounters something scary among this imaginary and, at first, friendly and cute environment.

### 6.1 Environment

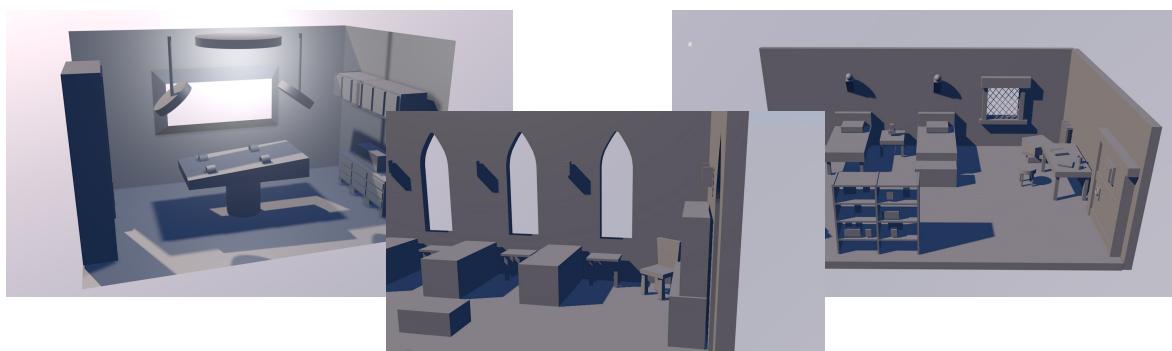
#### 6.1.1 Outside



*Design Team Sketches*

#### 6.1.2 Inside

*Design Team Sketches*



## 6.2 Playable Character

With a first person game, the player doesn't have animations, either animation states.



*Design Team Sketches*

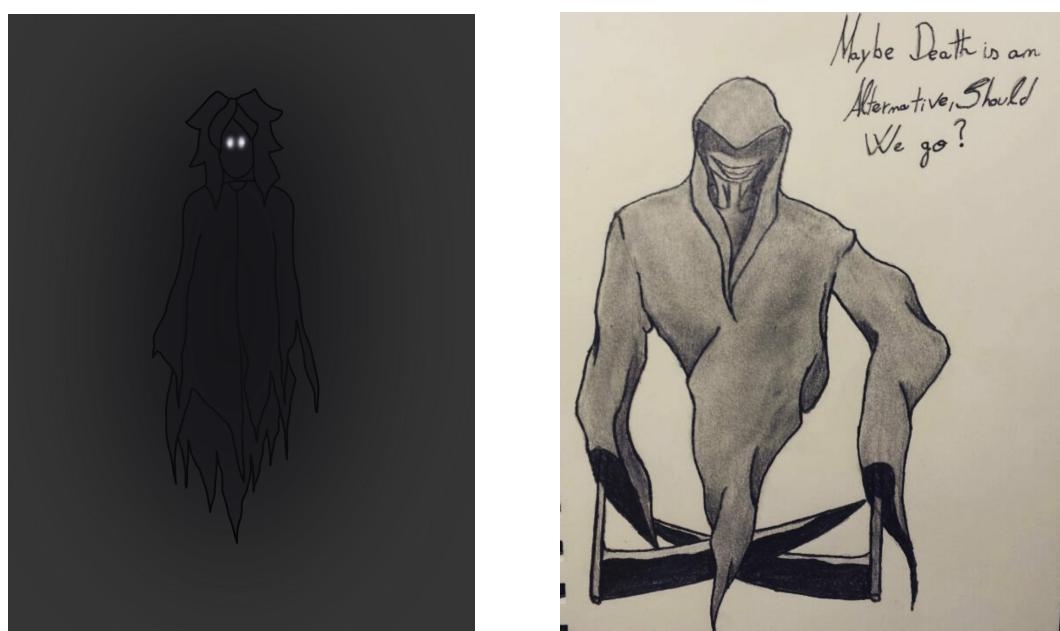
## 6.3 Shadows

Shadows have different animations according to the animal they represent, but every shadow has idle, patrol and run animation. Idle is in the moment that the shadow is looking for the player in a nearby area, the animation in this case is based on the character going up and down and the cape following the body movement.

Patrol is in the moment when the shadow is walking through the map, the cape will follow the behavior of the body and wind created by its movement.

Run is the moment when the shadow spots the player, the cape and body of the shadow gets more aggressive, making stronger movements to symbolize the will of the shadow to catch the player.

*Design Team Sketches*



## 6.4 NPC's

### 6.4.1 People(PEO)

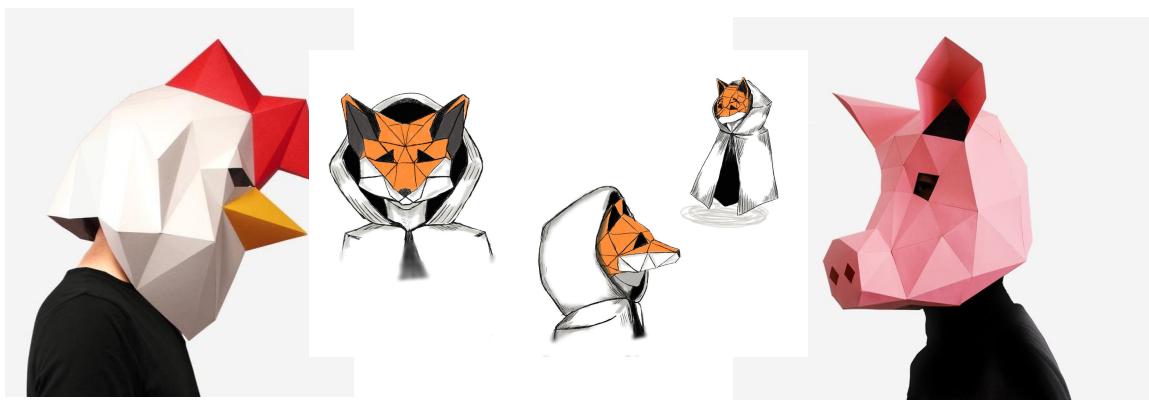
PEO has only one state of animation, and it is idle. As the section “2.4 NPCs” describes, these NPCs don't move, they populate the hospital to give the only perception of reality to the player and having only sentences to say to the player.



*Design Team Sketches*

### 6.4.2 Friendly Imaginary Friends(FIF)

FIF has the two animation states, waking and idle. During the walking state, the player will see the cape of the imaginary friend flying and moving according to his movements. In the idle state, the cape will have a small animation as the cape goes up and down.



*Design Team Sketches*

### 6.4.3 Hostile Imaginary Friends(HIF)

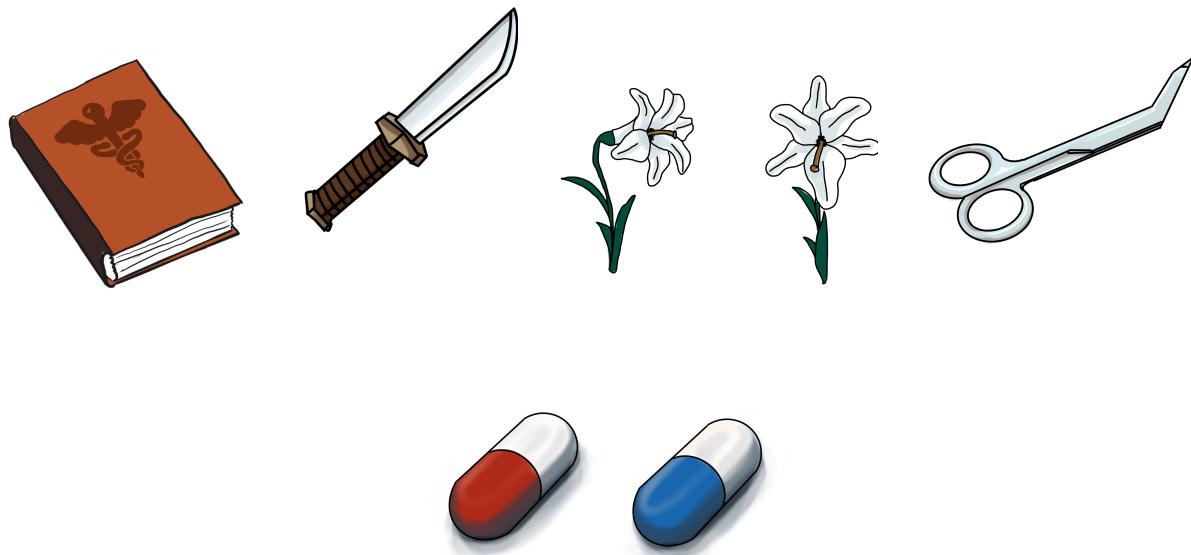
FIF has the two animation states, waking and idle. During the walking state, the player will see the cape of the imaginary friend flying and moving according to his movements. In the idle state, the cape will have a small animation as the cape goes up and down.



*Design Team Sketches*

### 6.5 Items

The items are described in the section “2.2.2 Items”



*Design Team Sketches*

## 7. Music & Sound Effects

Sound effects play an important role in Metanoia, as they are part of the creation of highly immersive gameplay. Sound in the game includes various effects, the main of which is the heartbeat that allows the player to estimate the character's current condition. It is, therefore, recommended to play the game wearing a headset.

### 7.1 Music

#### 7.1.1 In Menu

Metanoia uses "Hallucination" by Davide Di Pinto as ambient sound inside the menu scenes. The music uses a lot of silence between notes and tension moments to help create the pre-fear atmosphere.

The music was chosen by our group of testers and they voted this as the best choice.

#### 7.1.2 In Game

Metanoia uses "Fear of the Dark" by Davide Di Pinto as ambient sound inside the game. The music has a light tech composition to fulfill the environment and help in the creation of fear.

The music was chosen by our group of testers and they voted this as the best choice.

## 7.2 Sound Effects

The HeartBeat Sound effect is influenced by the HeartBeat of the player. The Speed of the Sound Effect is based on the formula below.

$$@HeartBeatPitch = (@heartBeat * 1.2) / 150$$

The volume of the HeartBeat is also influenced by the HeartBeat of the player. The Volume of the Sound Effects is based on the formula below.

$$@HeartBeatVolume = ((0.00085 * @heartBeat^2) / 6.01) - 0.0382 * @heartBeat + 2.58$$

### 7.2.1 In Menu

Action:	Sound:
Hover over the button	Light/Quieter HeartBeat
Click on the button	Hard/Louder HeartBeat
Changing between Scenes	Wind

### 7.2.2 In Game

Situation	Sound	Duration / On loop?
Shadow spawns	Thunder-like guitar strum	~1sec.
Player/NPC walking	Footsteps	On loop
Shadow patrolling	Quiet rustle	On loop
Heartbeat	HeartBeat	On Loop
Object picked up	Clatter	< 1sec.
Task failed	Growl + Shadow spawn sound	~3sec.
Task complete	Crystal clink-like sound	~2sec.
Shadow chasing player	Heartbeat sound getting louder and faster	On loop
Player character dies	Child scream	~1sec.

*Music/Sound Effects Repository: <https://tinyurl.com/MusicRepositoryMetanoia>*

## 7.3 Music & Sound Effect License

Metanoia uses only 2 musics, the music created by Davide Di Pinto. Here is the license applied for the music.

- **Music:**

“Items under the production of Davide Di Pinto can be used in Merakkie Studios commercial and non-commercial projects for free.

You are licensed to use the Item to create an End Product that incorporates the Item as well as other things, so that it is larger in scope and different in nature than the Item. Merakkie Studios have the permission to download, copy, modify, distribute and publicly perform the Music Items on any web or social media platform, in podcasts and in video games, as well as in films and presentations distributed on CDs, DVDs, via TV or radio broadcast or internet based video on demand services.

The items have the direct ownership of Davide Di Pinto, and all the members of Merakkie Studios in the year the product is delivered.

The team must give credits for the creator of the music in the documentation, and inside of the game if a credits scene exists.”

- **Sound Effect:**  
“**Royalty Free Sounds**

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