

TRAILUMA

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1 Summary

Trauma is a 3D Single Player First Person Survival-Horror game, set inside the memories of Brian, a person that after a terrible accident falls into a coma. In this deep coma, the player will need to retrace Brian's memories, uncovering his fears and most importantly his hidden traumas. These traumas will be represented as monsters that will try to overcome Brian's mind, hunting him down in otherworldly ways.

Trauma's goal is to immerse the player in a dangerous world, where exploration is essential to survive, with realistic graphics and a decadent and dark mood.

The game mixes survival and horror genres elements, thanks to the maintenance of parameters and gathering useful resources to survive into the game and creepy elements like the environment and the enemies, targeting dedicated survival horror fans ranging from 18 to 30 years old.



The soundtrack is edited by the musician Giorgio Michele De Giorgio.

2 Gameplay

2.1 Introduction

The game is set in different locations called Thalamus where the player must explore to solve puzzles and avoid enemies while managing the Dread and Mental Health parameters.

The player will have many ways to manage their parameters.

They can handle the Dread by using:

- A Flashlight to light their way and drive out enemies
- Any sourcelight, useful to keep calm
- The Deep Breath, helping the character to remain calm in the face of danger

While they can handle the Mental Health by using:

- The Memento, a shapeshifting item that will be used to heal the Mental Health

Deeper analysis in the [2.7 paragraph](#).

2.2 Game Pillars

Below are reported all the game pillars used throughout the entire development:

- Realism: nothing in the game setting is realistic to its core, we want to communicate to the player that everything seems like a distant memory or a kind of distorted illusion.
- Managing Mental Health and Dread: the main parameters will be key to the game flow, to engage the player constantly without feeling like a drag to manage them.
- Powerlessness: the player won't be able to truly defeat the Trauma in normal gameplay, so, avoiding it and using the given mechanics to stop him temporarily will give the player that feel of being not the hero, but someone that needs to save themselves.

2.3 Success

In Trauma the main success condition is to complete all the main locations (Thalamus) of the game and reach the end of the story in which the character will overcome the main enemies (Traumas).

The other success conditions, given by completing intern game loops, are:

- Survive: The main gameplay session is divided in momentum where the player needs to gather resources that will let them to survive, managing Dread and Mental Health from collapse;
- Escape: The player will win if they will be able to escape from the Trauma, avoiding to be seen by it or stunning it with the flashlight if the monster would find the player;
- Puzzles: Puzzles will be numerous in the game, giving the player a way to progress in the game, through key items, and also to obtain resources;

- Thalamus: Every handful of puzzles will contribute to the bigger picture of the current area they are placed in(Thalamus), unlocking the final puzzle needed to complete it: this will be the player's mid term goal that will advance the story of the game.

2.4 Failure

The player fail condition of the game consists in the death of the character, with various possible causes:

- Killed by the Trauma: If the Trauma gets too close to the player or finds him in a hiding spot, the game is over and they can not do anything to avoid it.
- Death by exhausting Mental Health: if the player's mental health reaches zero, it's game over.
- Death by puzzles: some puzzles can have a lose condition leading to the character death if the said puzzle is wrongly completed.

The consequences of death are the loss of progress done after the last checkpoint or manual save.

2.5 Core Loop

The core loop of the game starts with exploration: while exploring the map, the player will come across Diary pages related to lore and puzzles. Moreover scattered around the thalamus the player will find resources useful to continue to survive and avoid the game over.

Said puzzle will push the player to explore new or already known areas to find clues and the items needed for solving the puzzle.

Once the puzzle is solved, a new area will be unlocked, restarting the loop.

2.6 Game Progression

The progression system will see the player going through each area, uncovering the secrets of the story and getting better at surviving while solving puzzles in different areas. The progression will be linear as far as areas go, but the Thalami themselves will bring the player in a complicated level where shortcuts and sub-areas will be convoluted.

The three thalamus will play in this order:

- Grandparents mansion: the player will spawn at the entrance at the start of the game
- Highschool: the player will reach this place after finding their way out of the mansion, finding themselves transported in the main character's highschool classroom after seeing the old garden.
- Factory: the player will reach this place after reaching the roof of the high school, finding the courage to jump in the pool below, fainting on impact and waking up in the old locker rooms of the factory he used to work in.

After this, there will be a short final area, concluding the story in the real world.

2.7 Parameters

The main parameters of the game are two: The Dread and the Mental Health, shown to the player with visual and audio cues, as explained in detail below.

2.7.1 Dread

Dread acts as a trigger for the mental health decadence, it starts at a 0 value and rises in situations related to what the character fears, such as:

- Darkness: staying in the dark without a light source will slowly rise the Dread
- Traumas: being noticed by the trauma will instantly make the Dread reach its maximum value

2.7.1.1 Deep Breath

Deep breath is a gameplay mechanic used to manage Dread. It's used by holding the button assigned to it: the more the player holds, the more dread will be lowered.

This mechanic has two major drawbacks:

- It can't be used while sprinting and crouch sprinting.
- It can attract the Trauma if too close, with a hearing radius of approximately 5 meters.

2.7.2 Mental Health

The Mental Health represents the health of the character and it is connected to the Dread, as explained below in this paragraph.

This value will start at maximum and decrease in some specific situation, such as:

- Getting hit by Minions will make the player lose a 20% amount of Mental Health.
- Getting hit by the Trauma will make the player lose all Mental Health and so cause a game over.
- Having the maximum value of Dread will make the Mental Health rapidly drop until the player brings the dread down.

If this value reaches 0, it's game over. The player can regain Mental Health by using the [Memento key item.\(2.9.2\)](#)

2.8 Lightscore System

The player visibility will depend on a factor called Lightscore. While the light helps the player to restore the Dread parameter, at the same time they will be more visible to the Trauma. As such, many source lights in game, like candles and windows, represent a way to recover from problematic issues with the Dread but they are also a peril for the player.

The working of this system is explained in the table in the [AI Sight chapter](#).

2.9 Key Items

The player shall use important items in the game world that will help them to survive and complete objectives, details below.

2.9.1 Flashlight

The flashlight will be the portable source of light of the player, found as the reward for the initial tutorial of the game, that needs batteries to be used.

It also features a secondary function called Focus, used to confront enemies for a higher battery cost.

2.9.1.1 Main use and characteristics

Its core function is to light up the game area for the player to have a clear view of their surroundings in the darkness, with the Focus used to temporarily disable the Trauma and instantly kill Minions.

Being a source of light, the flashlight, while turned on, stops the natural rise of Dread, but it consumes power and this consumption is increased when Focus is used.

To be used, it needs [batteries](#).

2.9.1.2 Batteries

Batteries are consumables found in the game map used to recharge and maintain the active use of the Flashlight.

They are mainly found scattered around the map(for example in drawers, on tables, etc) but can be also found in large quantities as a reward for secondary puzzles.



Every battery will grant half of the total charge of the flashlight.

The player can recharge the Flashlight even when the charge percentage is higher than **50%** but they consume a battery nevertheless.

2.9.2 Memento

The Memento is an item that changes appearance and how it works based on the Thalamus in which the player is currently located.

The main purpose is to regain Mental Health, with a few drawbacks.

2.9.2.1 Characteristics

The memento is used to regain Mental Health and it needs a specific consumable to be used.

This item can change effectiveness based on how the player uses it and attract the Trauma in some way, with a larger radius than the Deep Breath of **X** meters (see below for specifics)

It represents something that helped the character during his lifetime to cope with their traumas, so it transforms into different kinds of items with slightly similar uses.

2.9.2.2 Consumables

The Memento, being the main way to “heal” the player, has a finite number of uses given by the need of a consumable found in the same way as the batteries: the Memento Key.

2.9.2.3 Music Box

The music box is the Memento present in the first Thalamus(The Mansion), it produces a melody that soothes the character's mind, relating to his relationship with his grandmother.

The player finds this item in the Safe room, after the tutorial, laying on a table.

The music box emits a melody when played, and attracts the boogeyman.



2.9.2.4 The Lucky Charm

The lucky charm is the Memento present in the second thalamus(The School), it is a little orange potion bottle attached to a chain necklace, a gift from Brian's departed mother.

The player finds this item after the second Thalamus tutorial, when the music box vanishes in a flash of light to be replaced.

The bottle emits a faint cloud on use, concealing the player from enemy's sight, healing for a short duration and refilling every time the player kills a Minion or stuns the Trauma.

2.9.2.5 The Hero Statuette

The Hero Statuette is the Memento present in the third thalamus(The Factory), it is a small statue representing a humanoid figure with an extended arm and open hand.

The player finds this item after the third Thalamus tutorial, when the lucky charm vanishes in a flash of light to be replaced.

The statuette needs a "Statuette Tool" to be used to heal the player instantly of 30% of the total Mental Health. Its secondary effect is giving the player a different buff based on which kind of statuette tool the player finds:

- A sword: it gives the player more window to use Focus, reducing its cost by 50% for 2 minutes.
- A shield: it gives the player resistance to fears, reducing the amount of Dread lost in the darkness by 50% for 1 minute.
- A wand: it gives the player the possibility to be stealthier, silencing the noise of the deep breath to the enemies for 1 minute.

3 Characters

3.1 Introduction

In this part we will explain briefly the characters of the game: the protagonist and the enemies

The game features a small amount of meaningful characters, with just a handful really present as a model.

Below, we focus on the latter.

3.2 Protagonist

The player character is Brian a 30ish y/o man that after an accident is trapped in his mind and in the course of the game will avoid or overcome his traumas to escape his own mind.

Brian is an average looking guy, full of traumas and fears given by his difficult life, but with a positive outlook on things on a good day.

He has dark brown hair and eyes, he's 1,81 cm tall and he usually dresses pretty formally, thanks to his strict grandparent education on manners and etiquette.

In the game he will wear an orange turtleneck with a brown jacket with collar fur, black pinstripe pants, and brown outdoorsy low boots.

A little accessory he has is a metal broken wristwatch, to be specific, the glass covering the clock dial is cracked, but the watch works.



3.3 Enemies

The enemies present in the games will be of two kinds: Traumas and Minions, both having different versions based on the thalamus they are found in.

3.3.1 Trauma

Traumas are the main enemy of a Thalamus that will hunt the player until the completion of the level. They'll be a constant and looming threat, instilling fear and anxiety in the player, who needs to avoid his hunts at all times to survive.

The traumas will have slightly different behaviors, for example the level of active aggression or the senses of each one will differ from one another.

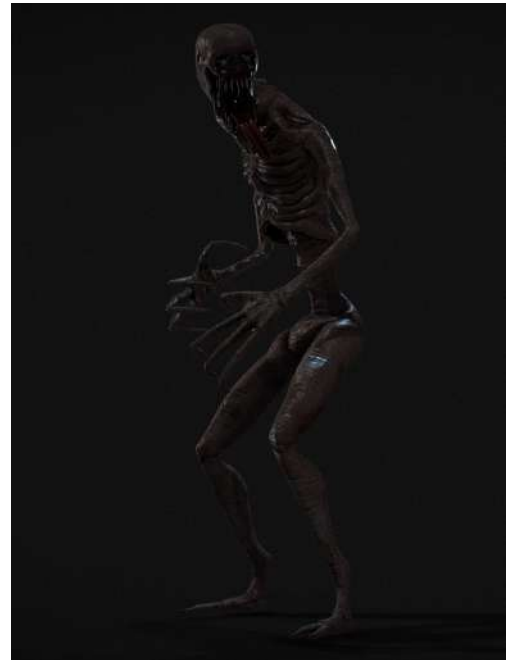
3.3.1.1 Boogeyman (Thalamus 1: Mansion)

The Boogeyman is the first trauma that inhabits the Mansion, born from Brian childhood fear of the dark and the stories told by his grandfather on this mythic creature that rules the dark and the night, stealing naughty children that leave their bed at night.

Brian imagines the monster as a tall skinny figure completely made of smoke, with undefined facial traits and big, white and empty eyes. This is how the player sees the boogeyman as well.

The Boogeyman roams the halls of the mansion mindlessly but has heightened hearing, chasing the player whenever they make some kind of noise(as stated before) or when they enter their direct line of sight(roughly a cone 5 meters in front of the Boogeyman)

This Trauma can be stunned by the focus of the flashlight and emits a low pitched breathing sound that the player can hear whenever he's too close(roughly starting 20 meters away with a very faint volume, rising gradually when the trauma gets closer.)



3.3.1.2 School shooter (Thalamus 2: High School)

The Shooter is the second Trauma, inhabiting the High School, born from Brian imagination running wild listening to the news as a teenager, when many school shootings happened all throughout America.

The shooter is a hooded man with a rifle in hand, roaming the halls in a constant hunt of everything that still breathes.

It has a keen eye and can see far(10 meters cone in front of them), but doesn't hear too well when compared to the Boogeyman.

This trauma can be stunned by the focus of the flashlight and can be spotted being really careful and looking for the occasional light he shines around to search for survivors like the player.

3.3.1.3 The Machines (Thalamus 3: Abandoned Factory)

The machines is the third Trauma, inhabiting the Factory, born from Brian imagination when he was told that someone had been brutally crushed inside a machinery in that same factory.

This trauma is an environmental enemy: every room contains some static machinery that will try to kill the player whenever they get too close(1 meter) and takes the form of a pile of broken down metal pieces, spawning near the player whenever they stun too many static machines.

The pile version doesn't see or hear, but it reacts to movement of any kind in a 10 meter radius, despawning if they don't find the player or they are stunned 2 times.

3.3.2 Minions

The Minions are minor enemies that represent more common fears amongst humanity that resides within every person's mind. In this game they are shown as small humanoid creatures without face features and damaged bodies and are present in every Thalamus.

They spawn whenever the character dread is at maximum value, one immediately upon reaching this value and one every 30 seconds after this if Dread isn't lowered.

They act as guard dogs, spawning in the rooms directly connected to the one the player is currently in and looking for the player with their vision.

They can see the player in a 5 meter cone in front of them(direct line of sight), but they can't hear anything.

If they see the player they chase him with a moderate speed(between the walking and running speed of the player), if they lose sight for more than 5 seconds they lose interest, starting to guard the room they currently are in.

They can despawn in two ways:

- Being flashed with the focus will kill them.
- After they hit the player, they dissolve.

A hit from the minion will damage the Mental Health for 30% of its total value, leaving the player unable to use the Deep Breath for 5 seconds.



4 Artificial Intelligence

4.1 Introduction

In “Trauma” the player will face two kinds of enemies, the main one or Trauma and the secondary ones the minions. The two have different AIs that control them.

The AIs work on the basis of receiving stimuli caused by something or someone and react to them.

In this case the three senses used are:

- Sight, it reacts to visual stimuli (e.g. The player is visible in front of the Trauma)
- Hearing, it reacts to auditory stimuli (e.g. The player runs producing a sound that can be listened to by the AI)
- Damage, it reacts to any sort of damage that the player can deal to the enemies (e.g. The player uses the flashlight, in focus mode, to stun the Trauma)

4.2 Functionality

The feeling the team wanted to obtain was to have an advanced AI that always felt like hunting and giving anxiety to the player.

This is obtained from the Trauma AI. Using all the previous mentioned senses, the trauma can locate the player based on how they behave in-game. On the other hand, minions will be present in the game world that will annoy the player when moving freely, but can also be lost.

4.3 AI Trauma

In order to have an AI that hunts the player, without being frustrating, it was necessary to design each sense in every detail and do precision work to find the right compromise between something realistic and something playful.

The AI lays the foundations on two logic models:

- Finite State Machine
- Behaviour Tree

The First one is used to choose the Macro Behaviour that characterizes the Trauma. As for actual behaviour, that is managed by the Behaviour Tree.

In addition to this, the Trauma will have two different modes:

- Front Mode, whenever the Trauma is visible and free to patrol around the house.
- Back Mode, when the Trauma becomes invisible and starts to teleport in different points of the house.

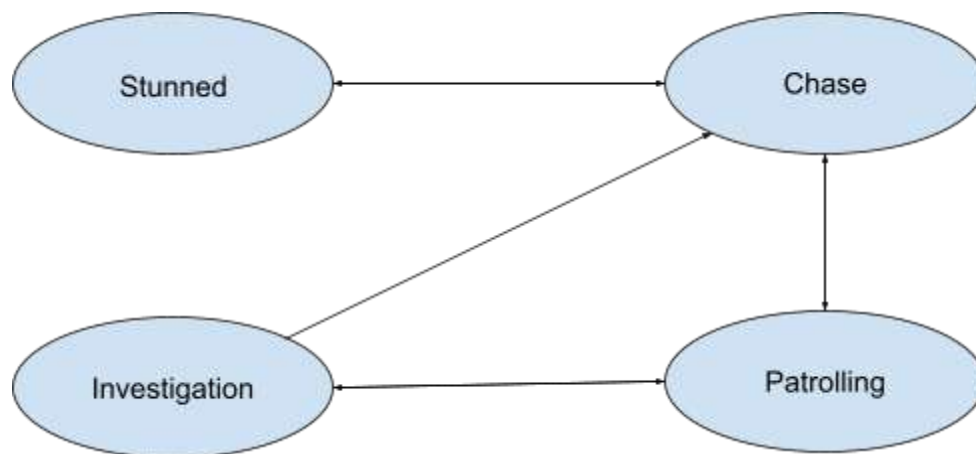
Below we will discuss more specifically what was previously mentioned.

4.3.1 The Front Mode

As previously mentioned this is the mode in which the Trauma will spend most of its time. In this mode the player will be able to see the Trauma and it will use all of its senses to find the player.

In the following chapters will be shown what will be the Finite State Machine, Behaviour Tree and how the senses will work.

4.3.1.1 AI Finite State Machine Front mode



The main states of the Trauma can be represented by a FSM with these states.

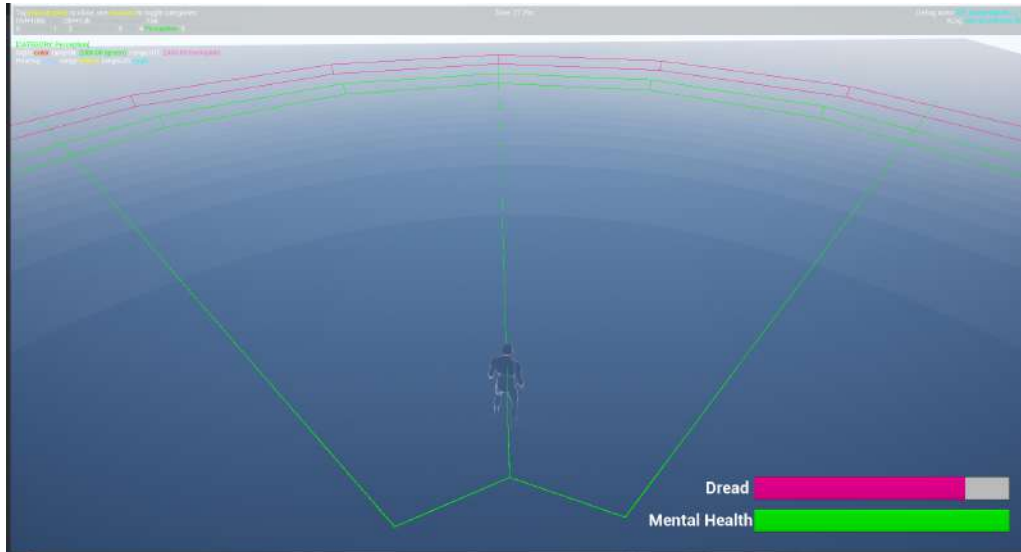
- Patrolling:
Whenever the Trauma is in this state it will patrol in specific points of the house. The next point will be chosen within a pool. As the fear rises, the pool will comprehend only points closer to the player.

- Investigation:
When the player will emit a sound that the Trauma can perceive, or if the player will be [semi-visible](#), the Trauma will get a Location where to investigate. It will go there and look for the player.
- Chase:
Once the Trauma sees the player, [visible](#), it will start to run towards them trying to get them. This also comprehended the investigation immediately after the Trauma lost track of them.
- Stun:
The Trauma will enter in this state only if the player will be able to point the flashlight in focus mode on the Trauma for a certain timeframe. In this status the Trauma will not move.

The different transitions will be listed here and told how they actually work:

- Stunned → Chase: After the stun cooldown ends
- Chase → Stunned: After the Trauma gets focused for the threshold time
- Chase → Patrolling: After the player is not detected for a certain amount of time.
- Patrolling → Chase: The Trauma is getting focused, Player is detected (e.g. the player points the flashlight at the Trauma)
- Patrolling → Investigation: Auditory stimuli, Semivisible Player
- Investigation → Patrolling: After the Trauma deprecate the Investigation Location (e.g. the Trauma looks for the player in the hideouts within the room, if it doesn't find anything he will go back to patrolling)
- Investigation → Chase: The Trauma is getting focused, Player is detected (e.g. the player points the flashlight at the Trauma)

AI Sight



The sight is the primary sense of the Trauma. In the picture we can see how it works, the green cone is the actual field of view of the Trauma, if the player will find themselves within it can be seen. What was to be achieved was to give the feeling that the Trauma did not behave in exactly the same way whatever the distance of the player and that the player could not exploit a blind spot of the Trauma to avoid being identified.

To do this, a system was designed which, by exploiting the player's Lightscore and his distance from the Trauma, is able to tell whether or not the player is visible to the Trauma. We can divide, as far as distance is concerned, our cone into three sections.

- Near Distance
- Mid Distance
- Far Distance

Once done this the next Division is the one related to the Lightscore.

The player can be found themselves in three states

- Darkness: The fear rise
- Semi-Darkness: The fear is stable
- Light: The fear decreases

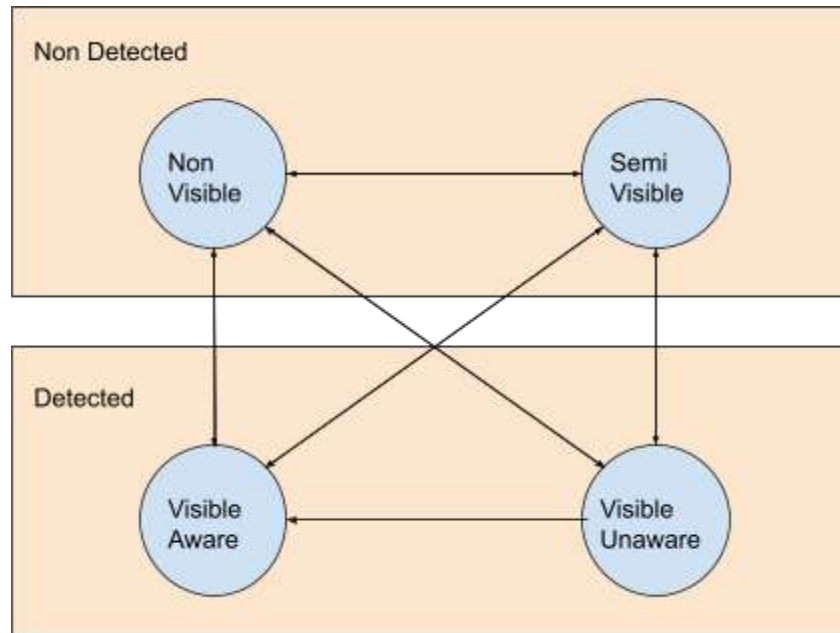
Thanks to this the following table has been created

Distance / LightScore	Dark	Shadow	Bright
Near	Visible	Visible	Visible
Middle	Visible after X	Visible after Y	Visible
Far	Non Visible	Visible after Z	Visible

With $X > Y > Z$

The player visibility can be:

- Non visible, the Trauma cannot see the player
- Semi-Visible, the Trauma can see the player after a certain amount of time if they continue to stay in this status.
- Visible Aware, the Trauma has seen the player and the player has seen the Trauma.
- Visible Unaware, the Trauma has seen the player but the player hasn't seen it



When the player passes from a state of non detected to one of detected, the Trauma will know their position and go in Chase

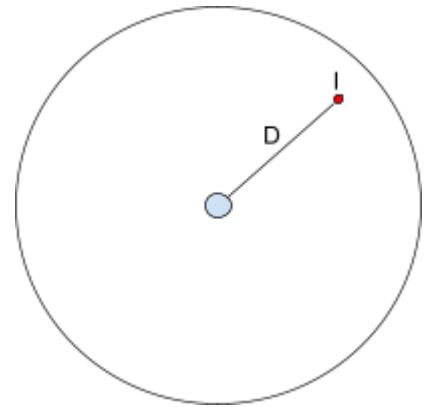
To do the same, from a state of detected to a non detected, the player needs to be not visible for a certain amount of time, the state in the state machine is Non Visible, in this case the Trauma will lose sight of the player.

4.3.1.2 AI Hearing

The second sense that the AI will use to localize the player is the Hearing. The Trauma has an area around him that determines its hearing.

Whenever a sound will be emitted by the player, using a simple formula the AI will be able to determine if that sound has to be perceived as a stimulus.

Assuming that the blue point is the Trauma and the red one is the location where a noise has been reported. If the value of the Intensity (I) is higher than the value of the Distance (D) this will be perceived by the AI.



4.3.1.3 AI Damage

In this section are included all the interactions that the player can have with the Trauma using the flashlight.

The player can interact in two way:

- The player points the flashlight on the Trauma in normal mode
- The player points the flashlight on the Trauma in focus mode

In both cases the player will trigger the attention of the Trauma that will start to chase them.

If the player can point the flashlight in focus mode towards the Trauma for a certain amount of time, it will be stunned.

4.3.2 AI Back Mode

The trauma will only go into back mode after it has spent a continuous period of time in patrolling. In this mode the main enemy will be able only to use the hearing sense to locate the player. In this mode the boogeyman will be invisible.

In the following chapters will be shown what will be the Finite State Machine, Behaviour Tree and how the senses will work.

4.3.2.1 AI Finite State Machine Back Mode



In this mode the main states are only two:

- **Waiting:** In this mode the Trauma will be completely invisible to the player and they will not be able to interact with it.
- **Locating:** The Trauma will become invisible and will teleport around different specific points on the map and it will emit a sound to give feedback to the player. In this state it will wait for the player to produce a sound that can trigger it, when this will happen the Trauma will pass in front mode and investigate in that location. The action of teleporting will be repeated a specific number of times, if it will not find anything after, it will go back in front mode. If the fear of the player has reached a certain threshold, if it will find itself within a certain range from the player, even if they are not making any sound, it will pass in front mode.

4.3.2.2 AI Hearing

The hearing will be the same as in the section [4.3.1.3 AI Hearing](#) with minor tweaks on the distance radius.

4.4 AI Minion

Minions are minor enemies that spawn in the thalamus only when the player's mental health drops under a certain threshold.

These creatures are slower than the trauma and the player can escape from them using the sprint. Whenever they manage to get closer to the player, they will attack them and disappear. When the player's mental health rises the same threshold or when attacked with the flashlight in focus mode, all the minions will disappear.

The amount of minions that can spawn is limited both per area around the player and per all the thalamus.

If the player escapes far enough from a zone and they still have a low mental health, the minions will be moved closer to the player.

4.4.1.1 AI Sight

Minions will have a simpler logic than the one of the trauma regarding this sense. The main difference lies in the fact that the radius that the minions have is smaller and they will be able to see directly the player.

Whenever the player will escape from a minion, this will go back to patrol in the location where it spawned.

4.5 Technical Details

Description of what is used in order to obtain that AI (behavior tree, state machine). Optimization used and how data are obtained to do what it does

5 Level Design

5.1 Introduction

The Level Design is structured to have a very coherent environment for the narrative of the game but that can enhance also the gameplay.

All the maps are tangled environments made by corridors and rooms interconnected that can enhance player exploration and give them a good chance to escape from the chasing Traumas.

5.2 Thalami

The game is divided into 3 main locations called Thalamus. Each Thalamus is related to a particular Trauma that inhabits that location.

The Thalamus are:

- Mansion
- High School
- Abandoned Factory

The complexity of each building will increase as the game goes as the size.

If the player succeeds in escaping from each Thalamus a scripted event will lead them into the next one, while the final one is going to end in the final phase of the game.

Into the Thalamus are scattered puzzles interconnected to each other to let the player progress in game.

5.2.1 Thalamus 1: Mansion

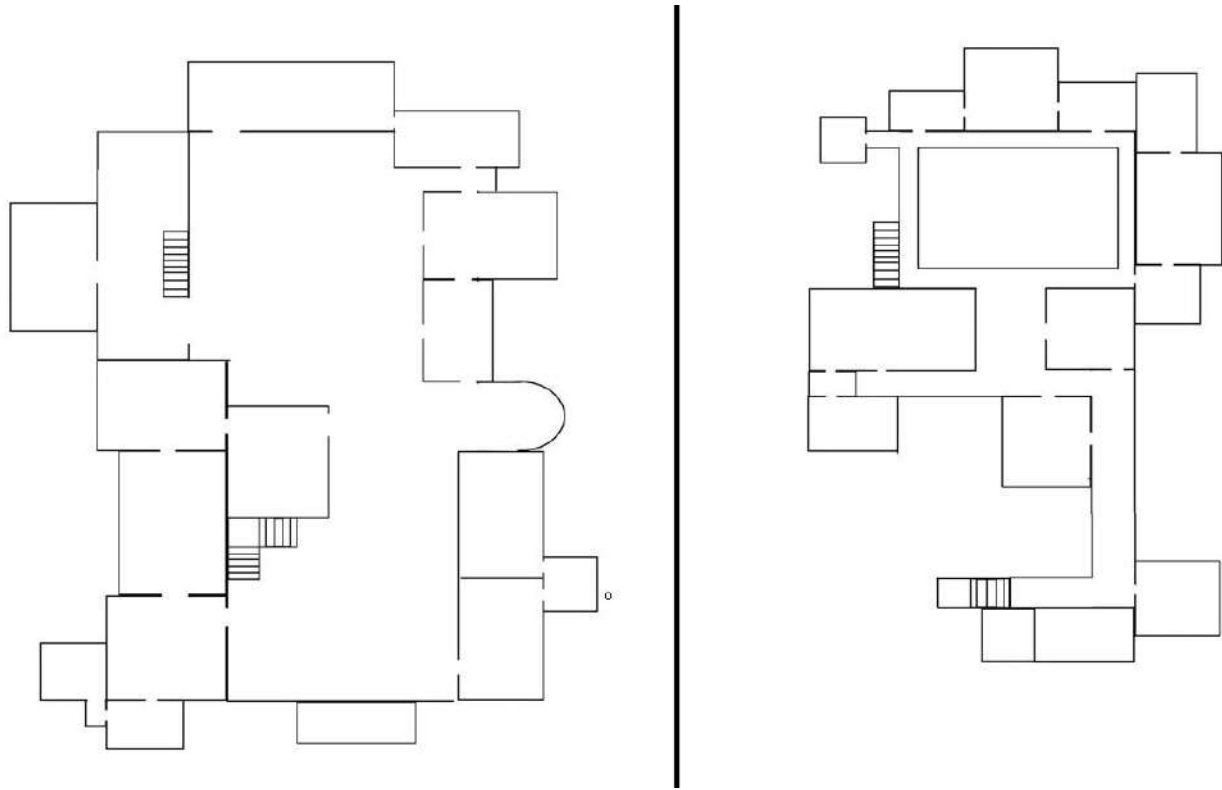
The Mansion is based on classic American mansions of the late XIX century. It represents the protagonist's Grandparent house and the place is inhabited by the Boogeyman that, once unlocked, will chase the player through it.

The mansion contains two floors and a haptic that is playable only for the introduction/tutorial phase of the level.

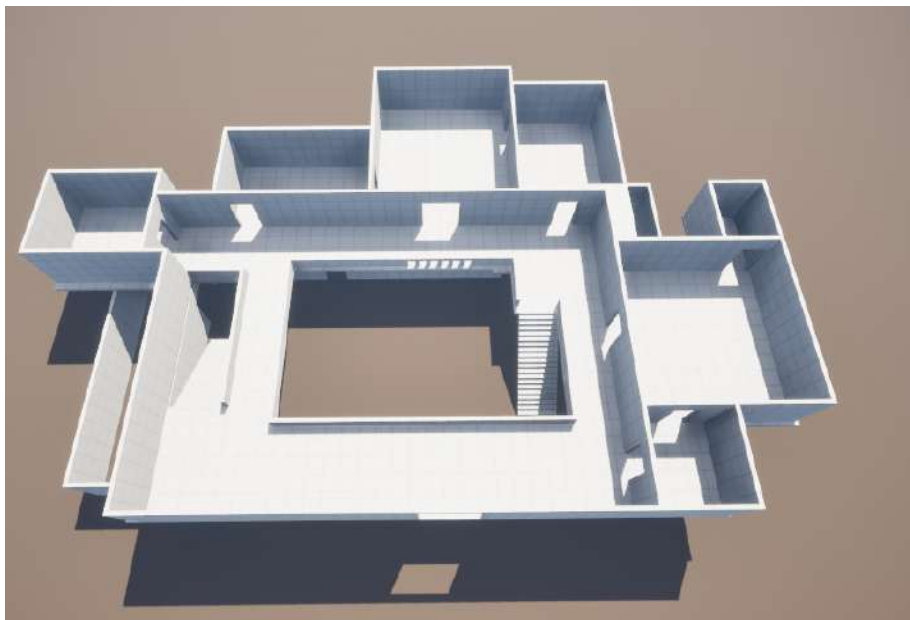
5.2.1.1 Analysis

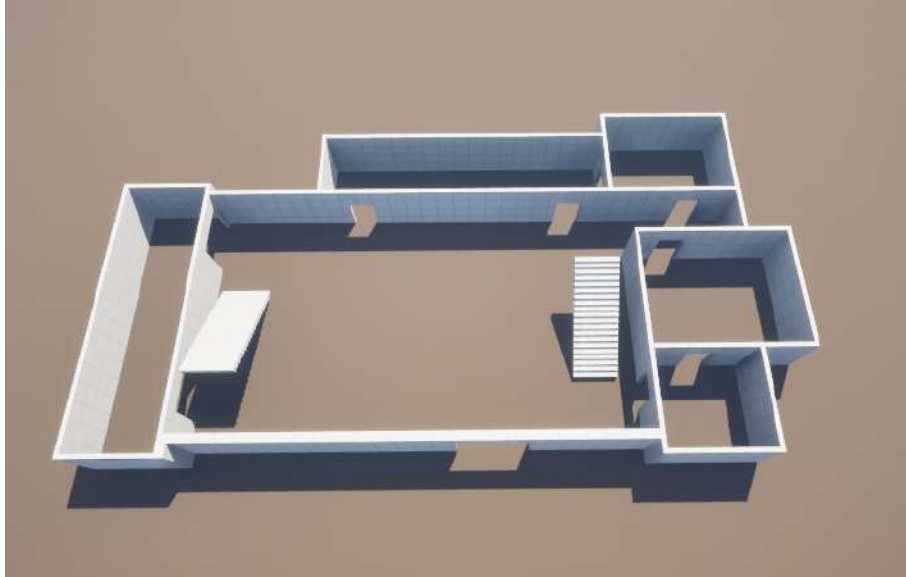
Refer to Level Design Document.

5.2.1.2 Blockout Model and Final Shape

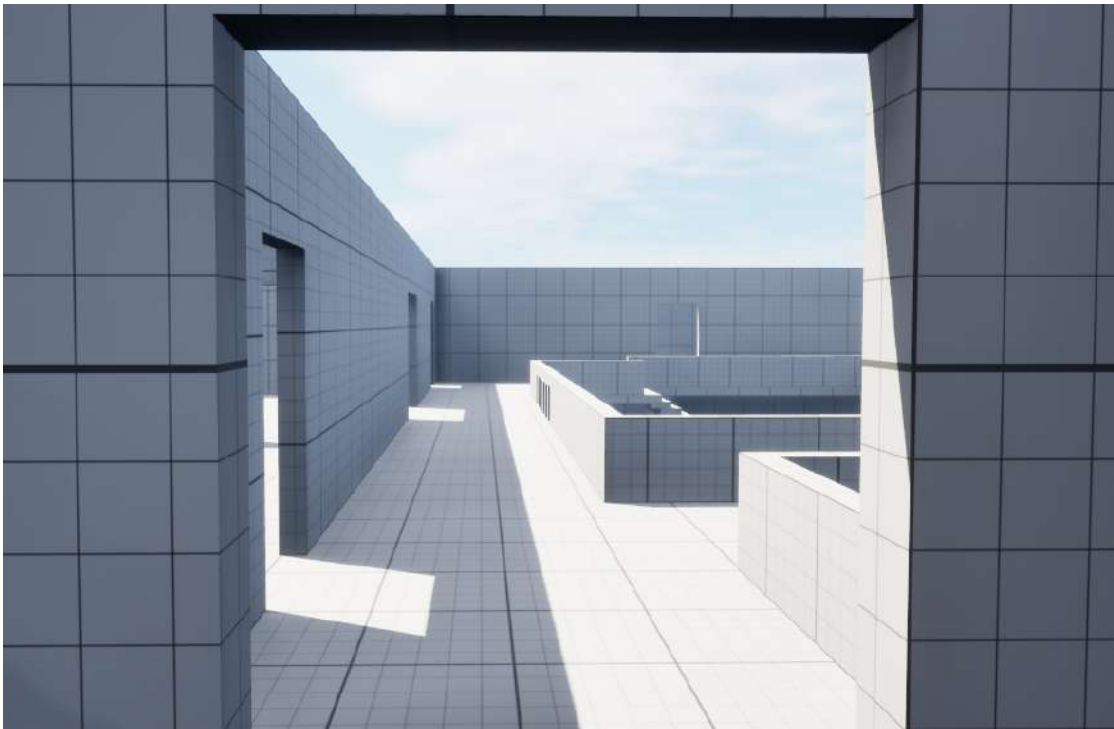


The blockout model is based on the layout that can show the complexity of connections of the rooms to each other but also give to the player enough space to move around.

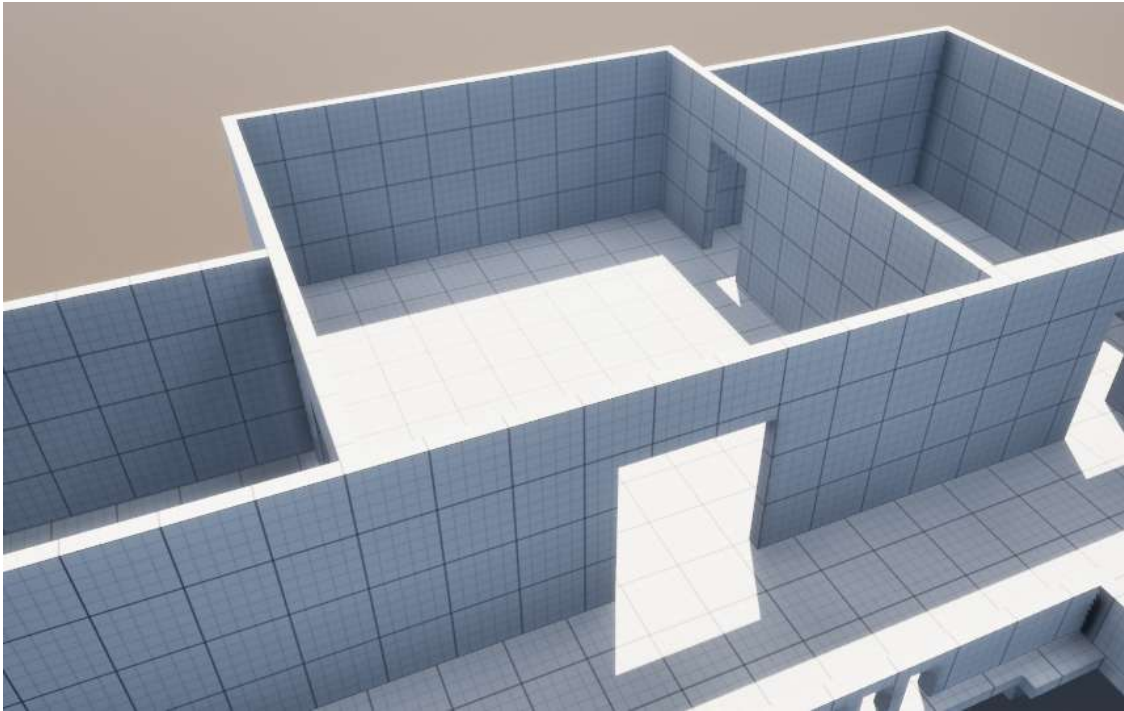




The game starts on the top left of the second floor, where the “Safe Room” of the player is located.



The first sight of the player outside the safe room lets them see all the available space they can explore.



At the second door on their left there is the main puzzle needed to proceed into the next area of the mansion.

The player will move into both floors to find any puzzle pieces.



More details in the Level Design Document.

5.2.1.3 Puzzles

Puzzles are scattered through the mansion in order to tell the players part of the story of the location and also to let them progress in the game. Puzzles can be both compulsory and mandatory. The mandatory ones provide to the player resources or collectables not necessary to end the game.

Follows a list of all the puzzles included in this Thalamus.

5.2.1.3.1 Puzzle 1

- **Name:**Gramophone puzzle
- **Location:**The puzzle starts in the living room, and requires the player to go to the salon and the grandfather's office
- **Items needed:**The player will need a **horn** from the salon and a **vinyl** from the grandfather office(in the safe from Puzzle 2)
- **Rewards:**The reward will be the door unlocked for the second chapter/area
- **Can the player die if it is not solved correctly?** No
- **Hints:**The horn is placed within vision of the original room, hanging from a chandelier where you find the gramophone and a diary page will lead the player to the safe for the vinyl
- **Solution:**Going to the ground floor, following and untying the rope that holds the chandelier will lower it enough to make the horn reachable and resolving the safe puzzle.
- **Other puzzle involved:** Safe puzzle



5.2.1.3.2 Puzzle 2

- **Name of the puzzle:** Safe Puzzle
- **Location:** Grandfather's office
- **Items needed:** The player needs to find a bottle of wine(salon), an american flag(living room) and a box of cigars(grandfather's office)
- **Rewards:** Vinyl for the Puzzle 1
- **Can the player die if it is not solved correctly?** No
- **Hints:** A stylized carving of the items needed on the safe itself.
- **Solution:** inspecting the three items and associating the numbers will give the player his solution



- **Other puzzle involved:** Puzzle 1

5.2.1.3.3 Puzzle 3

- **Name of the puzzle:** Paintings Puzzle(optional)
- **Location:** Grandfather's office
- **Items needed:** A painting located in the master bedroom
- **Rewards:** Batteries, a diary page with lore
- **Can the player die if it is not solved correctly?** No
- **Hints:** the wall with the safe has a painting missing(there is the shape of a recently removed item)
- **Solution:** bringing the painting to the room and hanging it
- **Other puzzle involved:** Puzzle 2



5.2.1.3.4 Puzzle 4

- **Name of the puzzle:** Chimney Puzzle(optional)
- **Location:** ???
- **Items needed:** glass of water from the bathroom(GL), vase full of dirt located in the greenhouse
- **Rewards:** a metal box with 3 batteries and a lore diary page
- **Can the player die if it is not solved correctly?** No
- **Hints:** a metal box can be seen below the fire
- **Solution:** The player will logically try to put out the fire using water, with a glass that can be found near the chimney and water from the bathroom tap, after that the fire will glow purple/green, an inner monologue will prompt the player to try to "suffocate" the fire. A flower pot in the greenhouse will become interactable.
- **Other puzzle involved:** Puzzle 6



5.2.1.3.5 Puzzle 5

- **Name of the puzzle:** Corridor Puzzle
- **Location:** The corridor before the master bedroom
- **Items needed:** None outside the corridor itself, but 3 items to rearrange correctly: flower pot, photo, statue

- **Rewards:** access to the master bedroom and the bathroom(1F)
- **Can the player die if it is not solved correctly?** Yes
- **Hints:** the corridor will have a trashed look, the items will have places to be put on to “tidy up”, the correct place will be hinted by the surroundings(example flower pot near to the water)
- **Solution:** tidying up the room incorrectly for 2 times will make the player die(from boogeyman or scripted?), but the correct placement will unlock the door, releasing the player from the loop
- **Other puzzle involved:**

5.2.1.3.6 Puzzle 6

- **Name of the puzzle:** Statues Puzzle
- **Location:** Greenhouse
- **Items needed:** a statue located in the master bedroom
- **Rewards:** Unlocking the third area for chapter 3
- **Can the player die if it is not solved correctly?** No
- **Hints:** 3 identical statues for 4 pedestals, the empty one will prompt the player to search for the fourth
- **Solution:** find the statue in the master bedroom
- **Other puzzle involved:** Puzzle 5, needed to access the master bedroom

5.2.2 Thalamus 2: High School

The High School is a 50s big building that features four floors and a roof, fully explorable starting from the second one where the character classroom was.

It has a classic high school vibe, being very monotone and with big areas.

5.2.3 Thalamus 3: Abandoned Factory

The Factory is a complex of three buildings, connected to each other by underground tunnels, featuring various heavy equipment, broken down machinery and old forklifts laying around motionless.

5.2.4 Hideouts

Hideouts are a main element of the player’s exploration since they represent a safe place from chasing Traumas

- **Name:** Closet
- **Kind of hideout:** Standing position
- **Interactive:** Yes
- **Characteristics:** The player needs to open doors and close them later to avoid Trauma’s sight



- **Name:** Desk
- **Kind of hideout:** Crouch position
- **Interactive:** No
- **Characteristics:** The player needs to crouch to hide themselves beneath it. Since it has no covers around the player is more exposed to Trauma's sight.



5.3 Resources

Placement of all the items described in the previous chapters (batteries, memento's keys, diary pages, etc) and their exact location in the map

Example

Resource 1: Batteries

Location: Room 1, Room 4, Room 10

6 Art and Aesthetics

6.1 Introduction

The art style of the game is thought to bend completely with the idea to keep the player immersed in the game by using elements that are present in the real world. For this reason the art is focused to be realistic, letting the player see and interact with props and elements easily recognizable from real life, and crafting at the same time the experience to involve typical feelings of horror games such as fear and thrill by working on dark colors, dark environments, limited lights, shadows and suggestive lighting.

6.2 Graphic Style

Using mid/high poly 3D meshes and realistic-like materials within the game, recalling old mansions and their typical rooms and furniture. This style has been used to convey in a better way the feel of immersivity and fear.

The choice was therefore driven by these needs.

6.2.1 Assets

For the list of assets available for the project, including but not only those that are already included in the current build, refer to the [asset trackability document](#). The following 6.2.1 chapter is at the moment not implemented and will be filled for the final version of this document.

6.2.1.1 Protagonist

- Name
- Link to the asset

6.2.1.1.1 Tools

- Name
- Link to the asset
- Location
- Does it need other items to work, if yes which ones
- Functionality

Example:

- **Name:** Flashlight
- **Link to the asset:** TBD
- **Location:** It can be found on the drawer on the right in the safe room
- **Does it need other items to work, if yes which ones:** In order to work it needs [batteries](#)
- **Functionality:** Flashlight can be used either to light up dark areas, and avoid dread to fall down, when used in normal mode or, when in focus mode, to stun Traumas and kill minions

6.2.1.2 Enemies

- Name
- Link to the asset
- Are they minions or thalamus
- Damage dealt to the player or if one shot
- AI sight radius
- AI hearing radius

Example

- **Name:** Boogeyman
- **Link to the asset:** It's been created changing the color to manny mannequin
- **Are they minions or thalamus:** This enemy is a Trauma. It can be found in the first thalamus, the [Mansion](#).
- **Damage dealt to the player or if one shot:** Whenever the Trauma hit the player, it will cause an instant game over since it will only take one shot for it
- **AI sight radius:** Range in 2000.0 cm, Range out 2400.0 cm
- **AI hearing radius:** 70000.0 cm

6.2.2 Environment Assets

For the list of assets available for the project, including but not only those that are already included in the current build, refer to the [asset trackability document](#). The following 6.2.2 chapter is at the moment not implemented and will be filled for the final version of this document.

6.2.2.1 Building

- Name
- Link to the asset
- In which Thalamus is used
- Size

Example

- **Name:** Grandparents' Mansion
- **Link to the asset:** Created by the group
- **In which Thalamus is used:** It's the building that is actually used in the prototype
- **Size:** Approximately 65m x 45m

6.2.2.2 Furniture

- Name
- Link to the asset
- In which room can be found
- Functionality
- It can be used with other assets

Example

- **Name:** Drawer
- **Link to the asset:** Created by the group
- **In which room can be found:** Hallway 1, Kitchen, Office 2 First Floor, Office First Floor, Office Kitchen, Player Room
- **Functionality:** It can be used to put object inside
- **Is interactable:** The player can interact with it by opening and closing it.
- **It can be used with other assets:** Can be used together with Cupboard

6.2.2.3 Resources

- Name
- Link to the asset
- Where can be found
- For what they can be used
- If they can be used what do they do

Example

- **Name:** Battery
- **Link to the asset:** Created by the group
- **Where can be found:** It can be found inside Drawer
- **For what they can be used:** Batteries can be used to replenish the flashlight charge.

6.3 Illumination

The illumination has a mix of baked and real time lights: the baked lights are used for the environments, while the few direct lights are real time, such as the flashlight of the player. The quantity of light that is used within every environment has been crafted to keep the balance between visual appeal and the horror setting.

The actual lights used within the game are mostly blue and cold colors for the environment to bend properly with the idea of night and enhance the feeling of isolation of the player within the mansion.

To enhance the feeling of the players giving visual feedback on the actual status of the health of the player, the actual environmental lights coming from the windows are dynamic and linked to the mental health mechanic of the player, shifting the colors from blue to red when the mental health reaches dangerously low levels.

7 UI and Controls

7.1 Introduction

The UI present in the game is very simple and intuitive, it features an interface that is introduced gradually, increasing the sense of immersion.

The UI icons used are few but effective, such as the one that shows when the player is hidden or the one inherent in the key objects that the player is using, such as the flashlight or the memento.

On the controls side, in addition to an initial introduction of a tutorial that teaches the player how to move within the game, the control scheme for player movement can be consulted in the pause settings.

7.2 Key Bindings

The following table is divided into three parts (Input, Action, Is mappable) :

- Input, the first one will be the keyboard input and the second will be the Controller Input
- Action
- Is mappable

Input	Action	Is mappable
W / Left Stick Up	Move Forward / After Pickup, rotate object upward	Only Keyboard
A / Left Stick Left	Move Left / After Pickup, rotate object left	Only Keyboard
S / Left Stick Down	Move Backward / After Pickup, rotate object downward	Only Keyboard
D / Left Stick Right	Move Right / After Pickup, rotate object right	Only Keyboard
Mouse movement / Right stick XY axis	Move the view	No
C Key / B Button	Crouch	Yes
Shift / Left Stick Press	Sprint	Yes
Left Mouse Button /	Turn on the flashlight in normal mode	Yes

Left Trigger	(If the flashlight is not equipped, this will automatically equip)	
Right Mouse Button / Right Trigger	Use Focus mode of the flashlight (If the flashlight is not equipped, this will automatically equip)	Yes
R Key / X Button	If the player have any, they will recharge the flashlight's battery	Yes
Q Key / Left Bumper	Hold down the Q key to turn the crank and use the memento(if the player does not have the keys the memento will not work)	Yes
E / A Button	Interact / Pickup Objects / Inspect	Yes
Tab / Back Button	Open inventory	Only Keyboard
Escape / Start Button	Pause Menu	No

7.2 UI elements

The elements that characterize the UI are:

- **Game Start Menu**
- **Pause Menu**
- **Inventory Menu**
- **Death Menu**

7.2.1 The Game Start Menu

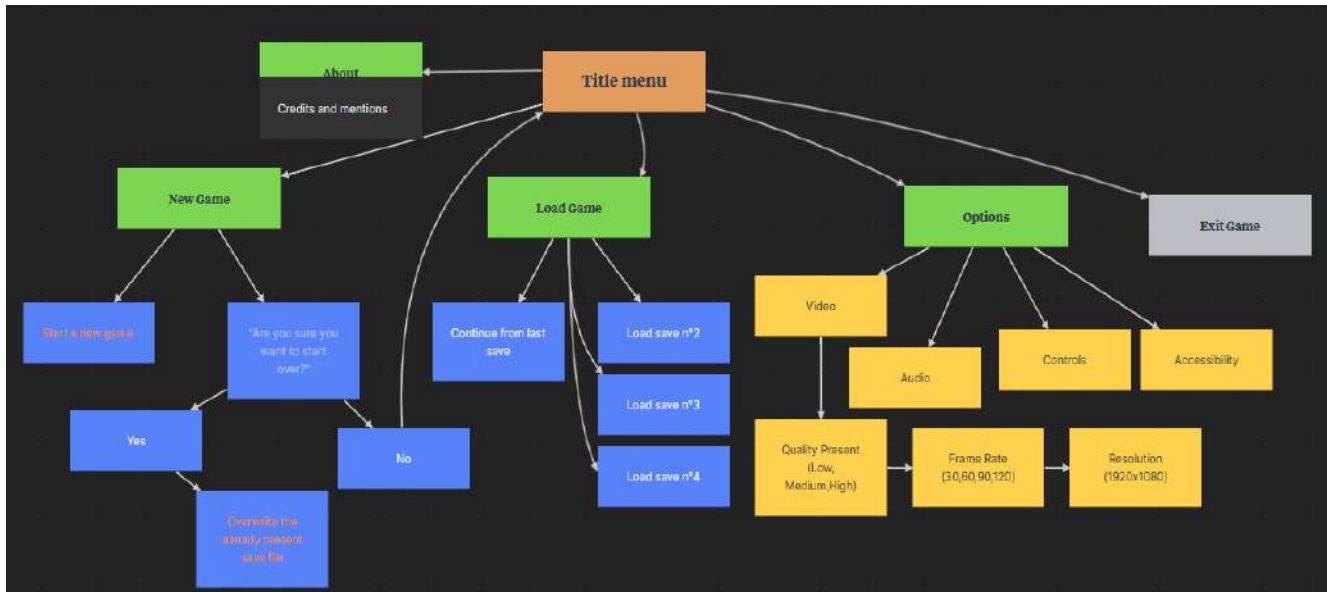
The Game Start Menu screen enhances the game setting, with a screenshot showing a small area of the house, “briefly describe the image”, at the bottom left are the various menu buttons:



- *Continue game*, pressing this button allows the player to resume the game from where they left off during their previous game session.
- *New Game*, this button allows the player to start a new game.
- *Options*, by pressing this button the player has the ability to configure the game settings to his liking, by opening the options menu the settings are divided into:
 1. *Accessibility* = Clicking on the accessibility option opens a small menu, in which there is a choice of colorblind filter, based on the type of colorblindness, and the ability to choose High Contrast Subtitles
 2. *Audio* = In the audio section, the player can choose from several possible options, including general game volume, sfx, and music.
 3. *Video* = In the video section, the player can choose from several possible options, including brightness, window mode, and motion blur.
 4. *Controls*= In the sensitivity section, the player can choose from several possible options, including sensitivity, vertical and horizontal inversion options, and KeyBindings

5. KeyBindings = In the KeyBindings section, the player can set the choice of keys for the relevant actions at will

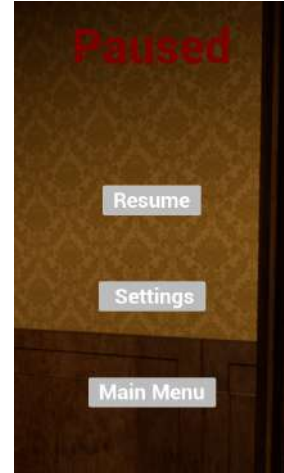
- *Quit Game*, by pressing this button the player leaves the game.



7.2.2 Pause Menu

The pause menu is very simple and is characterized by a simple screen that suspends interaction with the game, this screen shows a series of buttons :

- *Resume* = Pressing this button closes the pause menu and the player re-enters the game session.
- *Options* = By pressing on the options button the player enters into a screen of settings, which can be fully customized to their liking (Accessibility, Audio, Video, Controls, KeyBindings)
- *Main Menu* = Pressing this button takes the player back to the main menu of the game



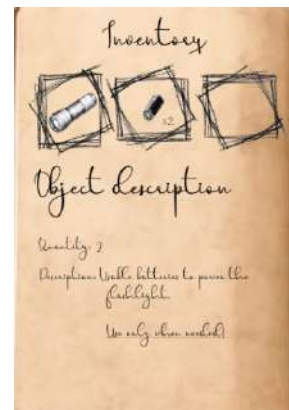
7.2.2.1 Inventory UI

The inventory system allows the player to view previously collected items, the aesthetic aspect has been designed to ensure an extra sense of immersion, with the presence of a diary that acts as an inventory system.

The inventory is made up of a series of empty slots that gradually fill up according to the items collected and clicking on each object opens a drop-down screen in which it is possible to select a series of items :

- *Equip* = Allows you to equip the selected item
- *Inspect* = allows you to inspect the object by rotating it three-dimensionally
- *Use* = allows you to use the selected object
- *Drop* = Drop the selected object to the ground

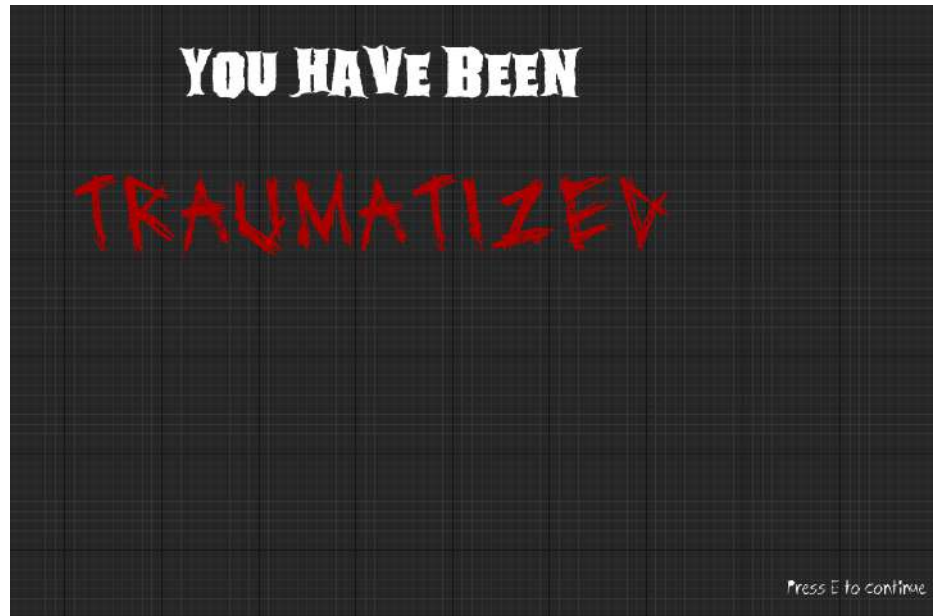
In addition, by selecting each object, a small description appears on the screen.



7.2.2.2 Death Menu

This menu appears whenever the player character dies.

The player can press E to continue from the last saved checkpoint.



7.2.3 In-Game HUD

The HUD elements present in the game are:

- The Flashlight and batteries
- The Memento and the keys
- The Eye
- The hand icon(picking up and interacting with objects)
- Dread
- Mental Health

The Flashlight and batteries

- The flashlight icon is shown as an image in the lower left corner of the game screen, it represents an ordinary battery-powered flashlight, and the image of the flashlight appears when the player is using it in the game. The image is static and therefore does not change with time.
- Batteries are represented with a small image next to the flashlight icon. The image shows the number of available batteries owned by the player.



The memento and the crank

- The memento is represented by a small icon at the bottom right of the screen, representing a small musical note, it appears when the player equips the memento, also the icon remains unchanged over time.
- The cranks are represented by (image) and are visible at the bottom of the death screen, the image shows the number of cranks the player has.



The Eye

The eye icon is located at the bottom and middle of the screen, it indicates whether the player is visible or hidden, it will be open when the player has been seen by the monster(s), while it will remain closed when the player has not been seen by any monster(s).



The hand icon

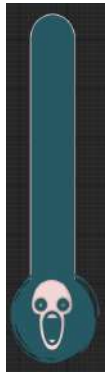
The hand icon is located in the central part of the screen and features two different images:

- *The open hand* icon indicates that the player can pick up an interacting object, such as a flashlight, and the hand image will appear on the screen only when the player points the view to that particular object.
- *The hand icon* represents the player's ability to interact with a certain game element, for example being able to open a closet door, the hand image will appear on the screen only when the player points the view to that particular object.



Dread

The dread icon is represented as a light blue vertical bar located at the bottom right of the screen next to the Mental Health bar, within it is a small image of a terrified face. The bar is designed to fill up should dread levels increase.



Mental Health

The sanity icon is represented as a red-colored vertical bar that is located at the bottom right of the screen next to the dread bar, within it is a small image of a brain, thus indicating the close connection to the concept of sanity. The bar is designed to fill up should fear levels increase.



8 Audio

8.1 Introduction

The game features a series of original songs and sound effects created by Giorgio Michele De Giorgio. The goal is to enhance player perception of the environment and the Trauma location in game.

More details in the [Assets Trackability](#) document, in the Sounds section.

9 Tech Analysis

9.1 Introduction

The project has been developed for pc, with an intention to bring it on console on a later date

9.2 Tools

A description about the main tool used for developing the game:

- Unreal Engine as the game engine
- Github to maintain the workflow stable for everyone
- Milanote used to organize the work
- Google Drive to share the work on documentation

9.3 Devices and Versions

Recommended devices and versions to play the game

- Minimum requirements: Nvidia GTX 1060
- Normal requirements: Nvidia RTX 2070 Super
- Best setting for experience: high
- Unreal Version used: 5.3.2
- Git repository link

10 Risk Analysis

[Risk Analysis](#)

11 Appendices

11.1 Introduction

Every asset has been reported to the owners in the document [Assets trackability](#).