

**Staffordshire University**

School of Digital, Technologies and Arts

*Gameplay Design and Production*

# **Individual Games Technology Project**

Research & Development Report

Lauren Pearce

# Contents

|  |           |
|--|-----------|
| <b>1. Introduction .....</b>   | <b>3</b>  |
| <b>2. Process .....</b>  | <b>3</b>  |
| 2.1 Collecting art inspiration, researching surrealism and adventure games ..... | 3         |
| 2.2 Blocking out of key ideas.....   | 10        |
| 2.3 Prototyping main mechanics and systems.....                                  | 15        |
| <b>3. Conclusions .....</b>  | <b>29</b> |
| <b>4. Moving Forward .....</b>   | <b>29</b> |
| <b>5. Appendix &amp; References .....</b>  | <b>30</b> |

## 1. Introduction

The project will explore fixed camera perspectives to add unique compositions to the level as well as attempt to bring a more cinematic quality to the overall game.

Light puzzle elements will be included to change pace so that the game isn't just a walking simulator.

Storytelling will be told through visuals (such as making use of symbolism, visual metaphors etc) note pages and subtitles.

Despite limited in experience with fixed perspective and cinecameras in Unreal Engine, the research phase should help build confidence and knowledge in camera systems.

## 2. Process

### 2.1 Collecting art inspiration, researching surrealism and adventure games

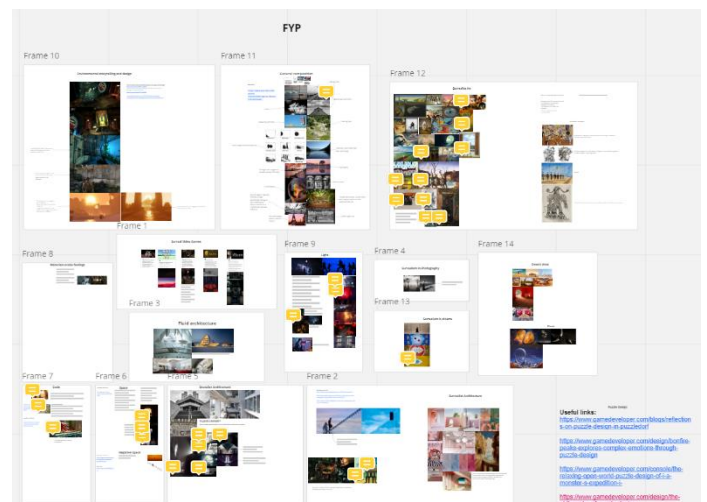
Gaining a grasp on the fundamentals of surrealism (ThoughtCo, 2011) is vital for this project's dreamlike sensation it should later evoke for players.

To build up knowledge of this artistic movement, Miro was extremely useful, as it acted as a hub of information to report back to.

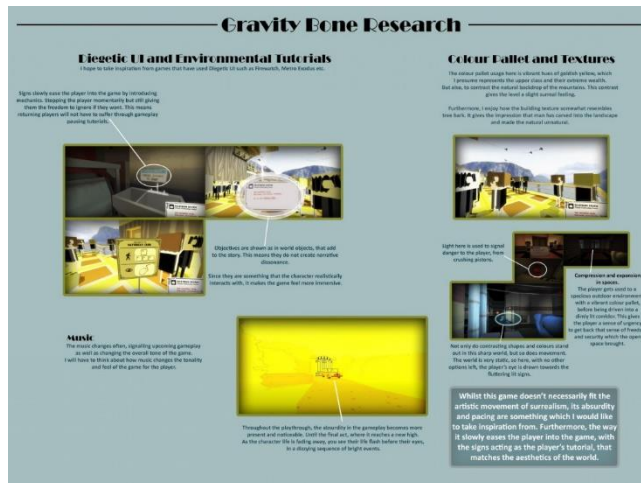
From this research, ideas could be pruned and adjusted to fit certain criteria more, such as juxtaposition, abnormal scale, visual puns, symbolism, blending concepts.

The board can be found here:

[https://miro.com/app/board/uXjVPNqMjmo=/?share\\_link\\_id=276654162770](https://miro.com/app/board/uXjVPNqMjmo=/?share_link_id=276654162770)



Researching other adventure games or games that incorporated elements of surrealism was done after gaining a solid grasp on the movement. However, research was not limited to just elements of surrealism (such as absurdity, spontaneity, humour) but storytelling and key adventure elements too.

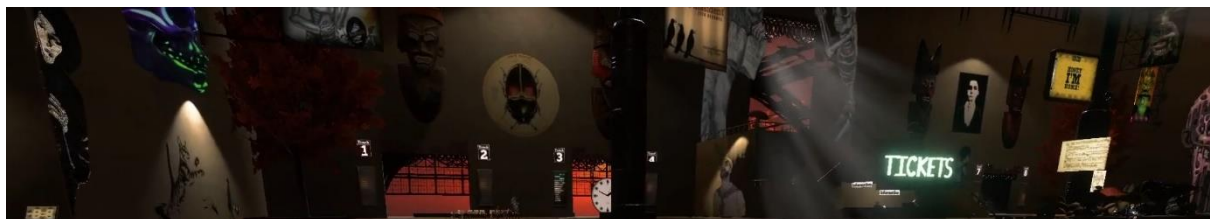


The games that were most beneficial to better aid comprehension of adventure and puzzle games were:

- Vanishing of Ethan Carter
- Gravity Bone
- Rhome
- Off-Peak

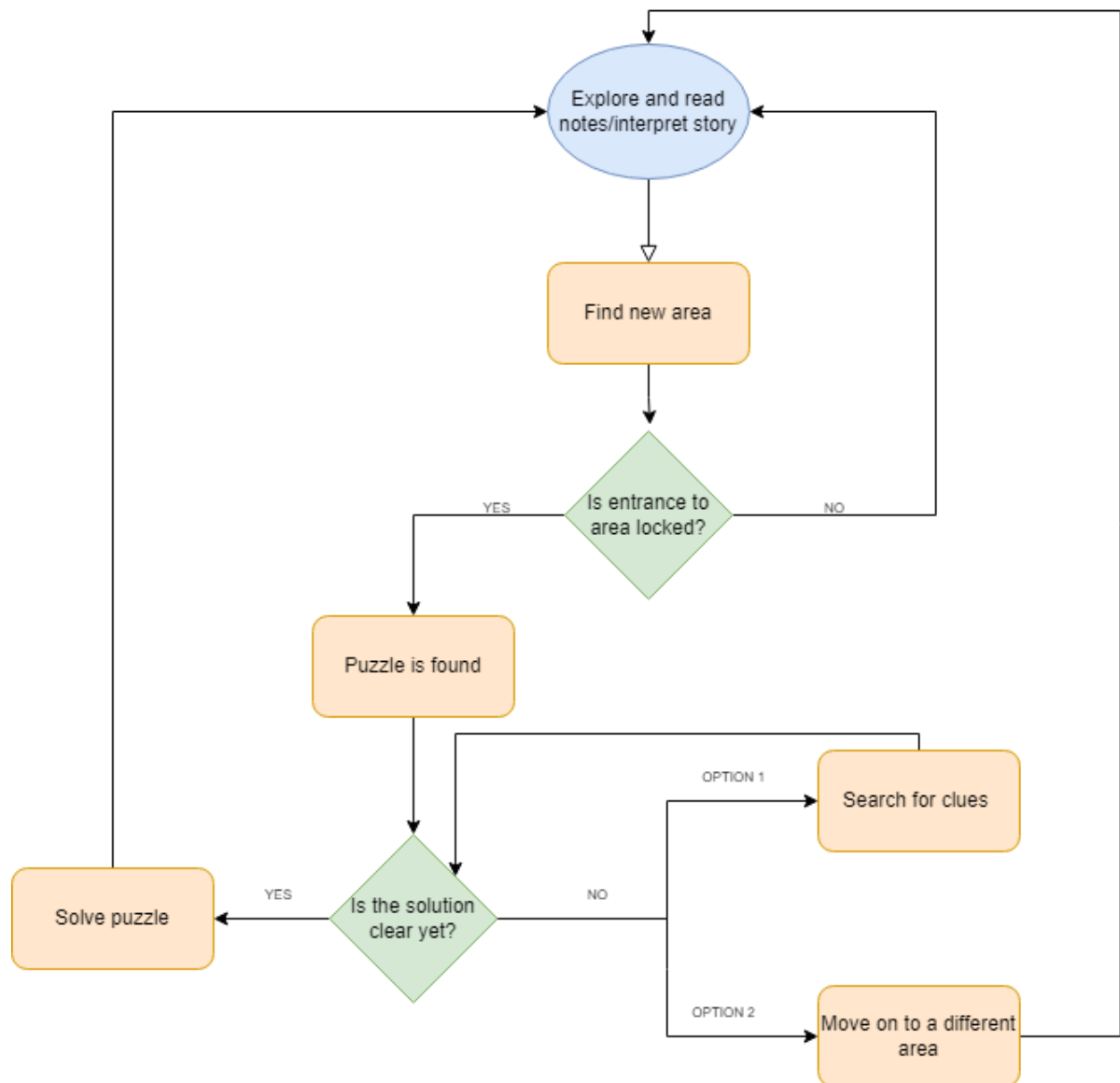
All were short to complete ranging from 10 minutes to 2 hours, used surprise as

reward, used confusion to compel completion of the game and had puzzle elements. Though, Rhome and Off-Peak will serve as the biggest inspirations out of them all mainly due to the artistic variety that somehow blends effortlessly into a town of creativity. Off-Peak's design can be likened to the surrealist technique Exquisite Corpse (where multiple people

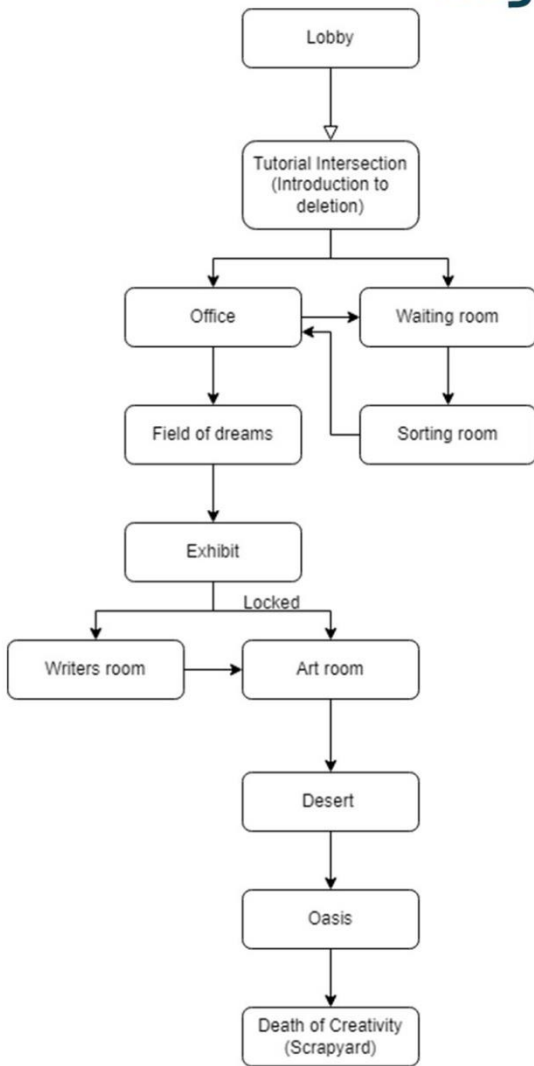


contribute to one art piece) due to the artistic variety (as evidenced below) as well as absurd scale. However, the overarching theme of time (clocks everywhere, windows to see the sun etc) was perhaps the most useful out of all Off-Peak achieved, as it enhanced comprehension on how to add the overarching theme of regret to the project.

Research on puzzle theory was also done, the Lock and Key Principle, MacGyver Method (Beckford, 2020), Designer vs Internal logic (Brycer, J. 2018). These methods helped enable understanding of their pros and cons and how they could be implemented. For example, the Lock and Key could fatigue players quickly as often there is only one specific solution but many possible combinations to solve. This also enabled me to establish a core gameplay loop with puzzles:

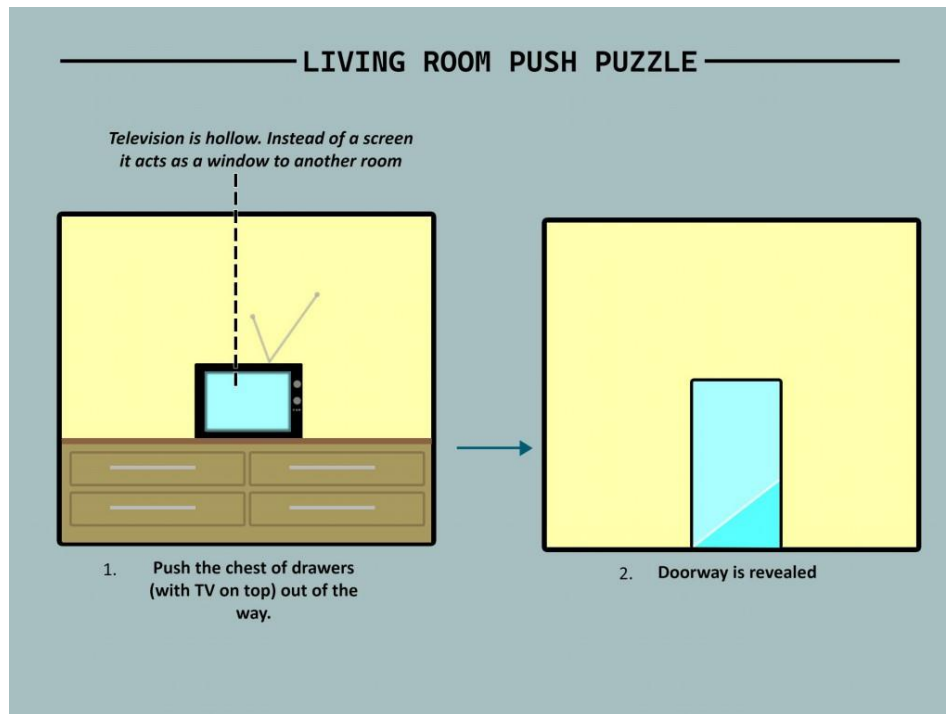


# Regretfall room flow



| Room                  | Regret(s)  | Items to delete            | Puzzle/Additional action to complete   | Additional comments   |
|-----------------------|--|----------------------------|--|---|
| Lobby                 | N/A  | N/A                        | Ring lobby bell for hallway to reveal  |   |
| Tutorial Intersection | N/A  | N/A                        |  | Decal saying "Deletion is the key". A faded room can be seen through a window with a sign saying "Exam in progress" pens on the floor outside and a faded textbook  |
| Office                | Not being bold enough to seek opportunities and staying caged in, often being pulled by the wrong crowd. | N/A                        |  | A paw print trail of destruction that paves through office décor such as sheets of paper, mugs, small plants etc. Guides the player towards the location, but ties into a story from her real life which is revealed in a note in the waiting room. |
| Waiting room          |  | Invitation to skip class   |  | Note reveals an anecdote where once she was peer pressured into graffitiing. When she came home she denied involvement, but her ginger cat, that follows her every move, came back with black socks that day leaving a trail of evidence.           |
| Sorting room          |  | Spray paint can (black)    |  |   |
| Field of dreams       | N/A  | N/A                        | Optional: can stay and enjoy the ambience before the next area which appears later.  | Acts as a transitional room of reflection, before the next more emotionally intense areas. Also directly contrasts the "desert" which appears later.  |
| Exhibit               | N/A  | N/A                        | N/A  | A small transition area with two doorways for the next areas. Laid out like an art exhibit but half of the room is poems/books and the other are paintings  |
| Writers room          | "Wasting time" on ideas if they've most likely already been done but better.                             | Book                       | Pick up book and throw into the fireplace to destroy it. Causes a chain reaction and the belt of books/pages around the planet of creation will disappear. |   |
| Art room              | Destroyed the leader of the graffiti groups painting   | Box cutter or own painting | Destroy the box cutter by throwing it into the void painting or destroy your own painting  |   |
| Desert                | N/A  | N/A                        |  | Sun timelapse area. An emotional transition fixed perspective area before reaching the oasis.   |
| Oasis                 | Living in a dream/doubting them  | N/A                        | Toss a coin into fountain and door will open   | A mini shopping area around a fountain, with bent lamp posts as palm trees.   |
| Death of creativity   | Deleting regrets and not accepting faults  | N/A                        | Touch all deleted objects, restores light to the room and game fades.  |   |

Looking into Designer vs Internal logic was particularly helpful, as the realisation that not everyone has the same life experience, therefore may not understand how certain elements work in cohesion was potentially useful for mitigating certain puzzle difficulties. It also spawned the idea that noticing the puzzles themselves as a reward in the first place, as due to the explorative and surreal nature of the game, could be enough satisfaction overall. The light puzzle below is an attempt to incorporate this idea.



## Fixed perspective research

### Fixed perspective angles examples

Cannot see what is around the top corner, so builds up anticipation whilst walking towards it

**Resident Evil Remake 2002**

Red carpet creates a leading line to naturally draw players attention up the steps as well as providing a colourful contrast.

Main character is framed and centred when contrasted with the painting, which also has a light source nearby to highlight it, as well as lines naturally pointing to it. Furthermore the subject of the painting rests on/near a rule of thirds grid intersection.

Leads into a zoomed in low angle to enhance the sense of vulnerability for the character as it exaggerates the scale of the mansion.

**Alone in the Dark: The New Nightmare**

The character is fully in control of this environment, with no surprises, just isolation. However, isolation does build anticipation, which is helpful with the upcoming transition.

Transitions to a fixed perspective frame within a frame shot, to allude to the prospect of being watched. This adds tension, as in contrast to the previous shot, the character's scale is reduced, and roles have changed, and he begins to feel more like prey and in less control than the previous scene.



## Lost in Random camera system

### Transition to fixed perspective and constrained movement



1. Before entering the "crawl space" the camera angles are fully controllable.



2. Just as the player overlaps the entrance, the camera smoothly rotates around the side of the crawl space entrance.

### Fixed perspective and free movement



Here the camera smoothly rotates to mimic the curvature of the bridge, yet the player movement is not constrained in conjunction. This can lead to some frustration, as players can bump into the bridge's edges which disrupts the smooth flow of the camera movement. However, it does build anticipation to arriving to the visual focal point.



3. Now the camera is fixed as so is the player's movement (y axis). The camera smoothly rotates in accordance to the player's movement. This feature is used in the conjunction with the introduction to the villain Nanny Fortuna, the constrained movement and focus being on her, adds to the sense of player powerlessness and Nanny's malevolence. The fact she is visible whilst the character's are seemingly hiding also gives her a sense of omnipresence.



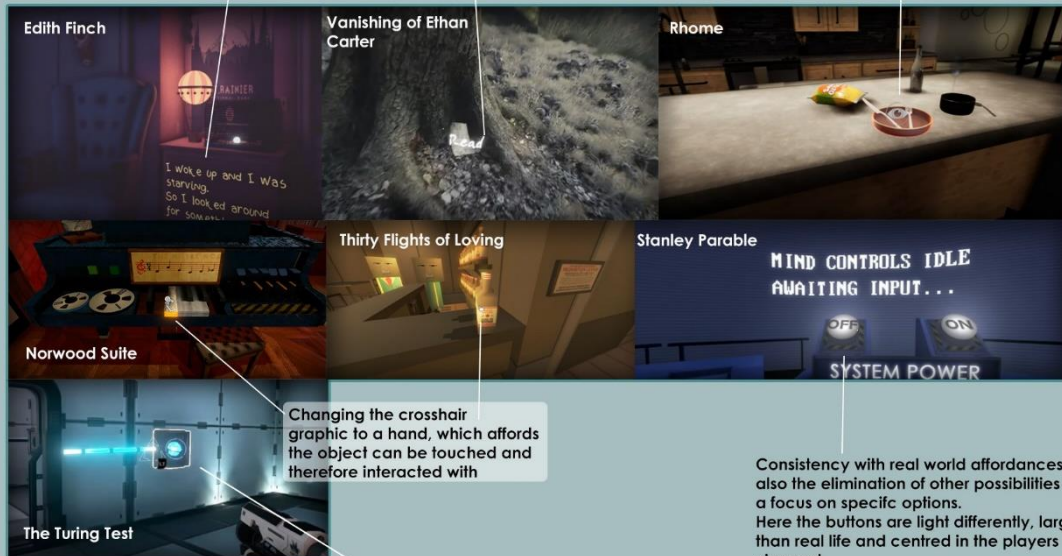
## Interaction research

### Adventure and puzzle game's ways of signalling interactability

These two both incorporate text taking up real world space, rather than just screen space. However, in Edith Finch the words replace subtitles whereas in Ethan Carter they replace the need for vocal explanation of puzzle hints and clues.



An symbol appears in the world space to show its a point of interest



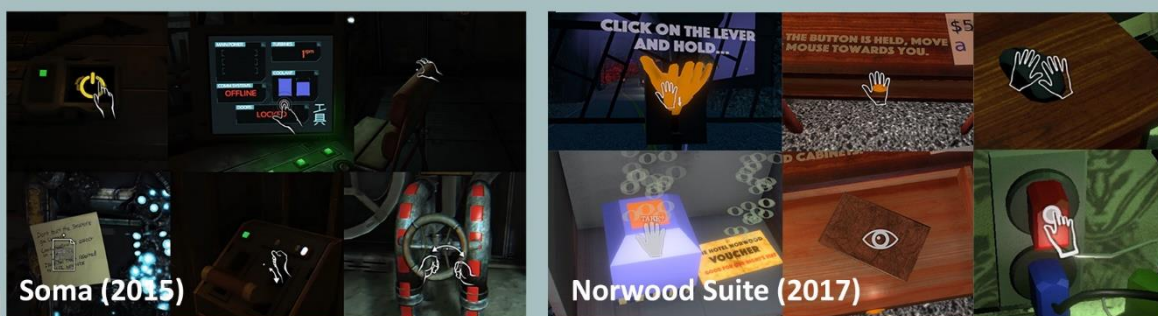
Changing the crosshair graphic to a hand, which affords the object can be touched and therefore interacted with

Outlining the object with a contrasting colour when in an interactable range

Consistency with real world affordances but also the elimination of other possibilities and a focus on specific options. Here the buttons are light differently, larger than real life and centred in the players viewport.

### Interact symbols research

Situationally dynamic interaction system, where different icons appear, based on the action the item affords, for example a lever affords pulling, so a clenching hand with an arrow appears



These symbols make understanding object's affordances a more efficient process, as well as mitigating risk of certain players, with less life experience, not comprehending what to do.

## 2.2 Blocking out of key ideas



lamp lights up as player passes, showing the connection to the next area is successful



KEY IDEAS, FUNDAMENTAL TO THE STRUCTURE OF THE PROJECT, OR ACT AS FOCAL POINTS, MARKS OF PROGRESS ETC, WHERE BLOCKED OUT FIRST. THE IMAGES ABOVE ARE THE MOST KEY ELEMENTS OF THE LEVEL. ONE ACTING AS THE TRIGGER TO THE NARRATIVE, THE OTHER ACTING AS A GUIDE FOR THE PLAYER.

THE WRITERS ROOM INCORPORATES COMPOSITIONAL TECHNIQUES LEARNED (O CARROLL, 2016), SUCH AS TRIANGLES TO CREATE DYNAMIC TENSION, TO FRAME THE SUBJECT AND CREATE CONTRAST.

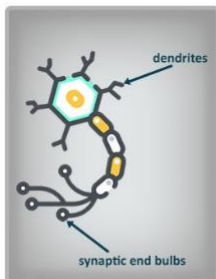
### Neuron Bridge

The fingers could be used as symbolism for dendrites and synapses on neurons, bridging memories together, since the level takes place in someone's subconscious.



Blockout Test UE5

Placing the sun just above the bridges fingers, to evoke a sense of desire, to allude that they may have some sentence in this realm.



The Golden Bridge's unique visuals gives a beautiful yet slightly unsettling atmosphere, due to the abnormal scale of the hands. I believe it lends itself naturally to surrealism.



Golden Bridge - Vietnam

## Blockout process

### Initial room blockout cons



Small writing bench more based of real world scale. However, it distracted from the overall triangular frame.

The closed off nature of the room created unnecessary tension, which is the opposite of its intended purpose (evoking a sense of wonder and curiosity, due to it representing creativity)

Whilst the notes forming an asteroid belt around the planet could fit the movement, symbolism could make the message clearer. Originally aimed for a relatively normal internal decor, with one focal point. However, due to the intended location in the game and emotional intensity, decided to opt for a more abstract interior.

**Elongated bench to frame view and added lamp to highlight future note**



### Final blockout piece



"Planet" blockout mesh was replaced with a lightbulb with the sun lining up through. Implying its of larger scale and changing the sun's role. Salvador Dali's painting L'Aurora also helped inspire this as it showed the effortless blend between the sun, the sea and egg yolk.



**Cut out two more views to give it a spacious feel**



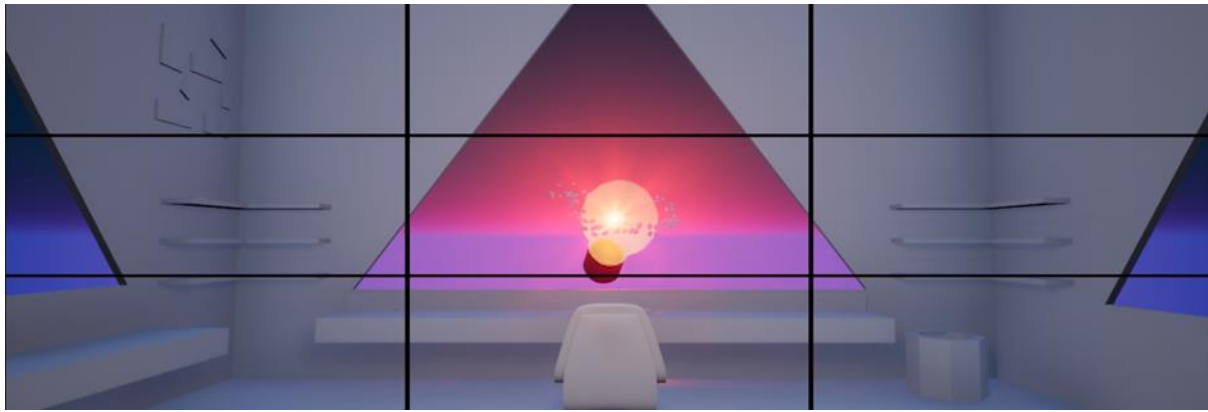
Inspired by Dylan Thomas' writer shed



Composition and film research was also key to attempting to give the project a more cinematic feel.

After having watched a GDC talk on Spatial Composition from an artistic director from Rockstar (GDC - Environment Design as Spatial Cinematography: Theory and Practice, 2019) the approach of overlay a rule of thirds grid on the viewport whilst testing the level has been implemented into this project's internal testing.





Seeing the space divided and what lines up with the grid has better helped the compositional visualisation of the level.

## Testing abstract imagery and bridge idea

### Bridge blackout test



### Model scaling distortion

Hand models scaled up looked sharp and ruin the view. Though could possibly have been mitigated by using detailed stone textures if lighting were better

### Lighting

The lighting was an abstract test to see how the colour affected the mood and conveyed to the player that they are in a dream/alternate reality. However, not only did it turn the world into a harsh hellscape, it also made the textures all black.

### Bridge (made with cubegrid)

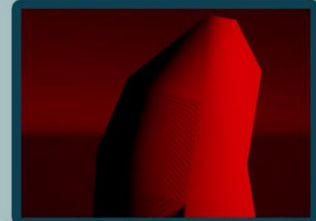
Lamp posts at the end of the bridge are obscured by the view and it does not look too much like a final destination. However, there was a plan to place a door on the end, but walking on the end of the hand, due to it not be flat but awkwardly curved, made for uncomfortable navigation.

### Testing view in Third Person with fixed perspective



Tested out the concept next with the fixed perspective mechanic to get a sense of scale, composition and to see how negative space affects the atmosphere. Whilst the concept was appealing and there was no issue with scale, the walk down was awkward due to the fixed perspective segment last too long as the character's silhouette eventually merged with the dark of the hand.

### Additional texture issues

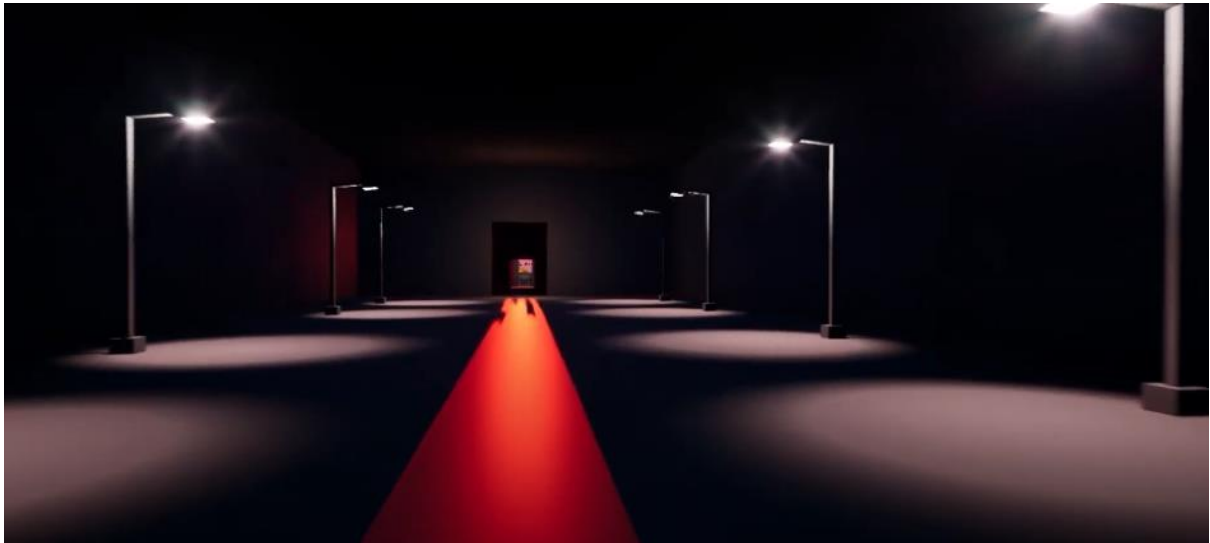


### Changes the issues prompted

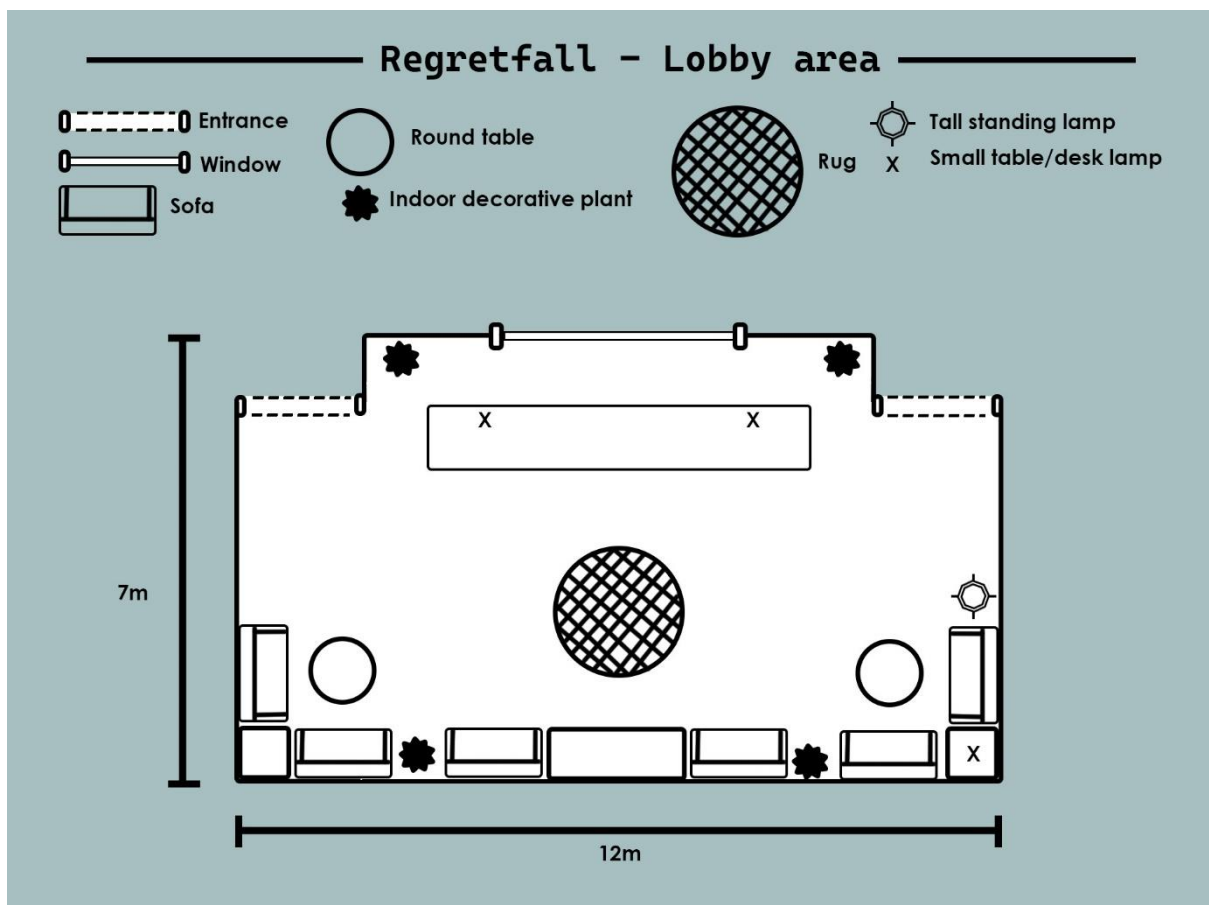
- Shifting to a soft colour pallet
- Make a test level to figure out desired colour pallet
- Make fixed perspective sections shorter in future so they don't veer off to one direction and where possible, if not using a spline movement system, angle it so they can walk in a variety of directions whilst still feeling natural



Since light will play a vital role in the project, due to it taking place in someone's subconscious, they represent thought processes, the lampposts were blocked out early so other areas can be composed with them better.



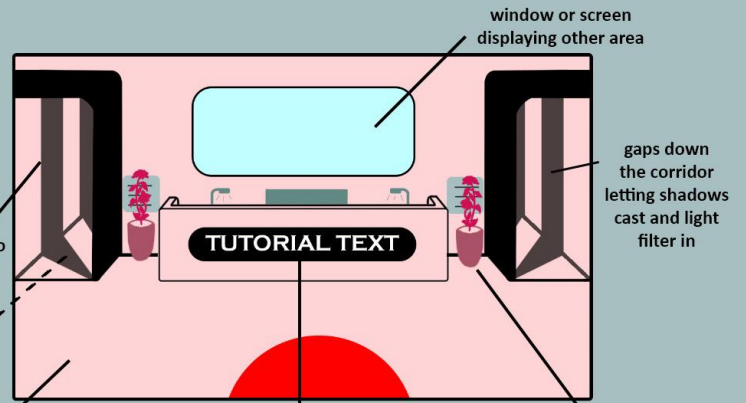
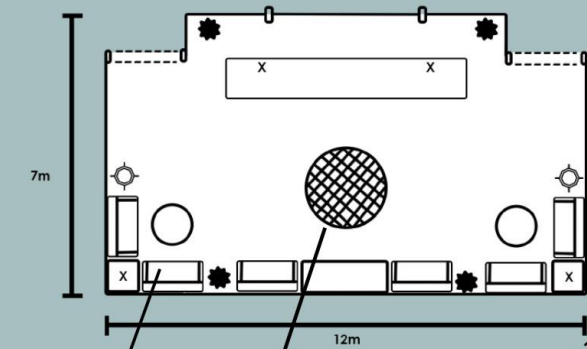
## Mapping



# Regretfall - Lobby - Start area

Lobby - Top Down  
Floor plan

Lobby - Front Desk View



seating areas with lamps

soft curved shapes  
to add to the calmness

real world functionality  
is often overlooked in certain  
areas in surreal architecture  
to favour unique patterns,  
such as light streaming in

corridor to  
next area

pastel colours

evoke feelings  
of calm

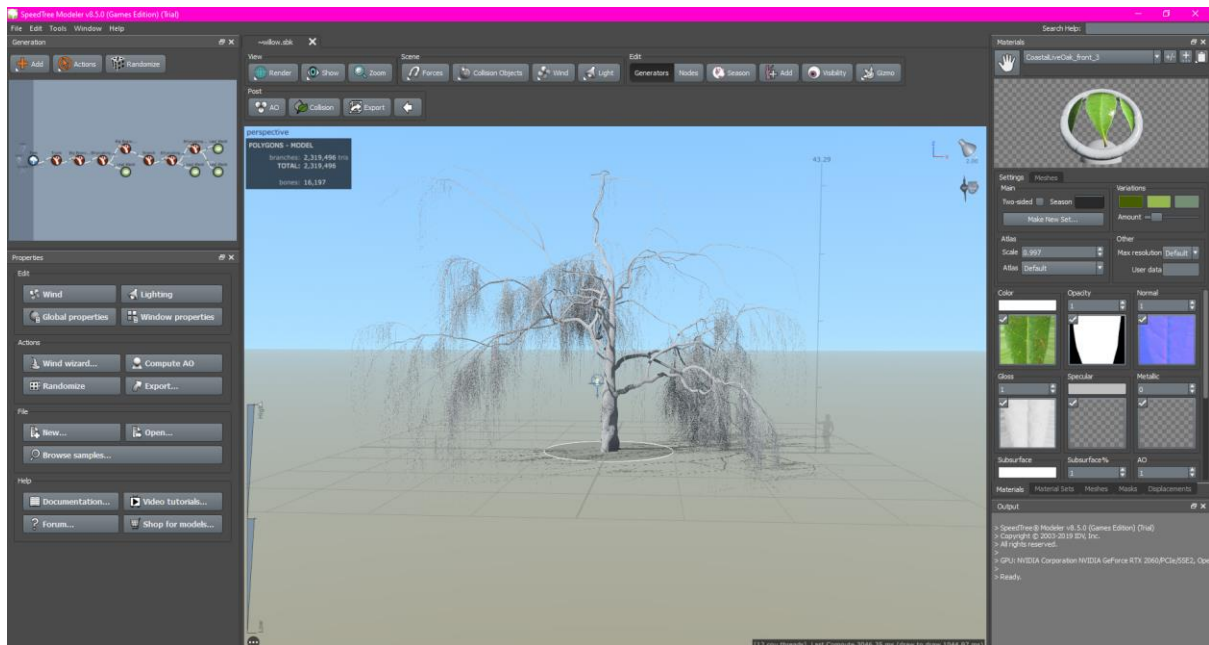
tutorial text is displayed on a  
scrolling sign, so players can read it in  
their own time

flow of time is not disrupted

some objects will cast the  
wrong shadows, for instance,  
plants could cast the shadow  
of a spade instead

at first glance everything  
seems relatively  
normal. However, upon  
closer inspection the  
environment is slightly  
confusing and unexpected

# Speedtree



For one section a willow tree is desired for the project, however, availability on the internet was limited and the quality of them was not up to a standard to include.

Due to this, Speedtree was researched, and a willow was attempted to be made.

Unfortunately, it did not go to plan and is very unoptimized. The software did not seem to work well on the computer, so following a tutorial (Adrien Lambert, YouTube) was troublesome. The issues faced with Speedtree prompted the continuation of the search for assets or a compromise.

## 2.3 Prototyping main mechanics and systems

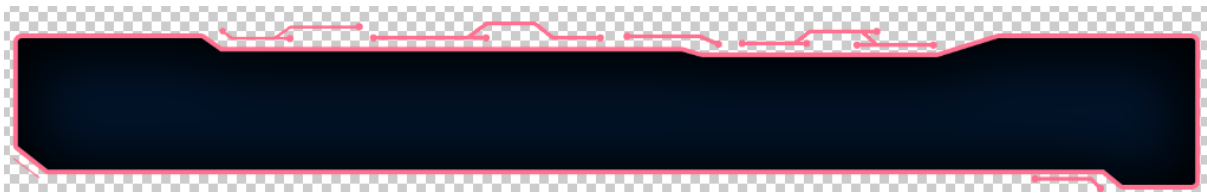
The first mechanic implemented was the **subtitle system**. With the narrative playing over a simple blockout, it better enabled the understanding of how player's interpret space based off the new information they absorb from the text.

Furthermore, narrative is a key aspect in rewarding and leading the player through the level, which is why it was the first one implemented.





The dialogue box was made in Photoshop, with pink lines on the edge, representing neurons.



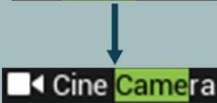
After implementing subtitles, a voice acting test system was implemented, however, with having received no voice acting training, the quality of the vocals was very unsatisfactory, prompting subtitles to be the main delivery of narrative.

After this **spatial audio** was tested, as ambience and audio will be a key aspect in creating an emotional response for the player, but also a great potential way to include juxtaposition (for example rock music in a calm area or electric guitar coming from a piano).



## Camera iterations

### Player camera



Changed from camera to cinecamera for more control over settings and more access to blueprints



Experimented with camera settings and came to the conclusion of IMAX 70mm filmback feeling the most cinematic. Also important for the later canvas mechanic as access to these settings made it possible.

### Issues faced

- Overlapping with the environment
- due to the camera being wider, environments previously blocked out had to be changed and new designs had to bear new settings in mind

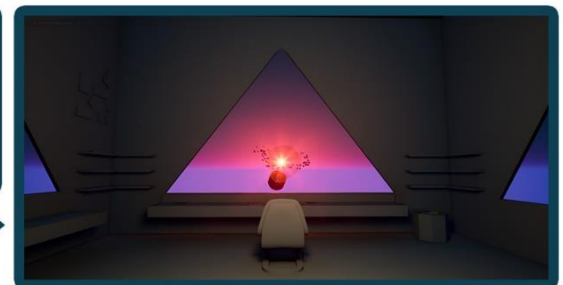
### Fix

- Change the camera location with the camera boom rather than just moving the camera thanks to this video: <https://youtu.be/jMyl5vvi76M>

### Experimenting with settings



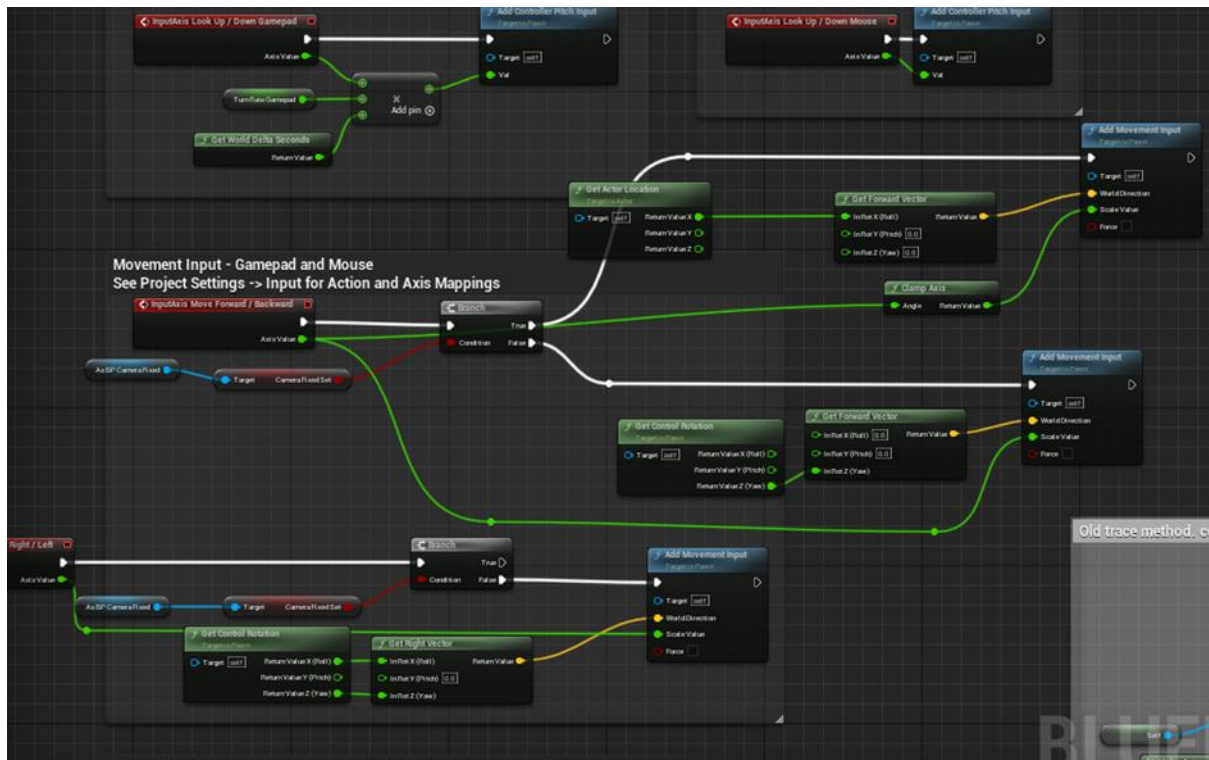
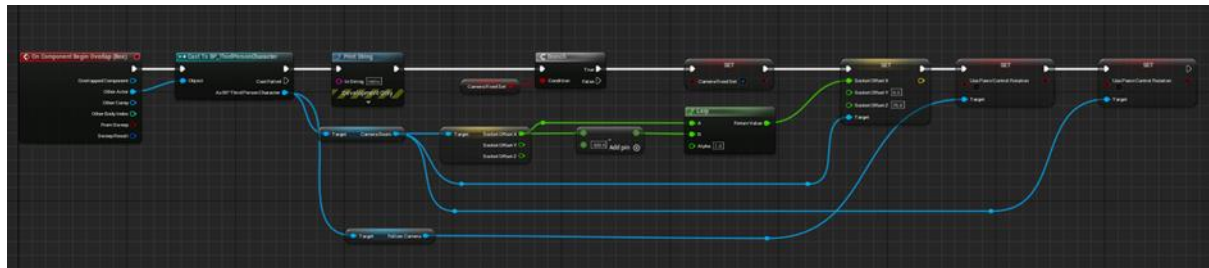
Whilst IMAX lens settings were quickly adapted, due to wanting to have a more cinematic feel, the other settings were more of a process. Here the focal length was 70mm, which whilst being better for picking out distant subjects (the bulb) added too much to the cramped feeling of the room upon entry.



But changing the player camera to be IMAX meant readjustment of the environment, particularly the corridor leading to the writers room was needed. As the wider camera meant the space felt more cramped, so it was widened. After this, it meant the approach to blocking out using real world measurements for scale, could be appropriately adjusted to fit the wider view.

Next was implementing a **fixed camera system**. The initial system was convoluted and not modular enough. Additionally, it did not blend well between the camera being shifted.

Rather than swap to another camera, it just moved the player's own camera, which made testing angles harder than needed.



The improved system works on overlap and blends between the players camera and a cinemachine. Using a cinemachine enabled more control over the cinematic feel and more experimentation overall.

For a while an issue occurred where black bars would appear, and the image would warp suddenly. This was because constrain aspect ratio was not enabled. This also solved another issue of the camera clipping with the character mesh when blended back to the original first-person position.

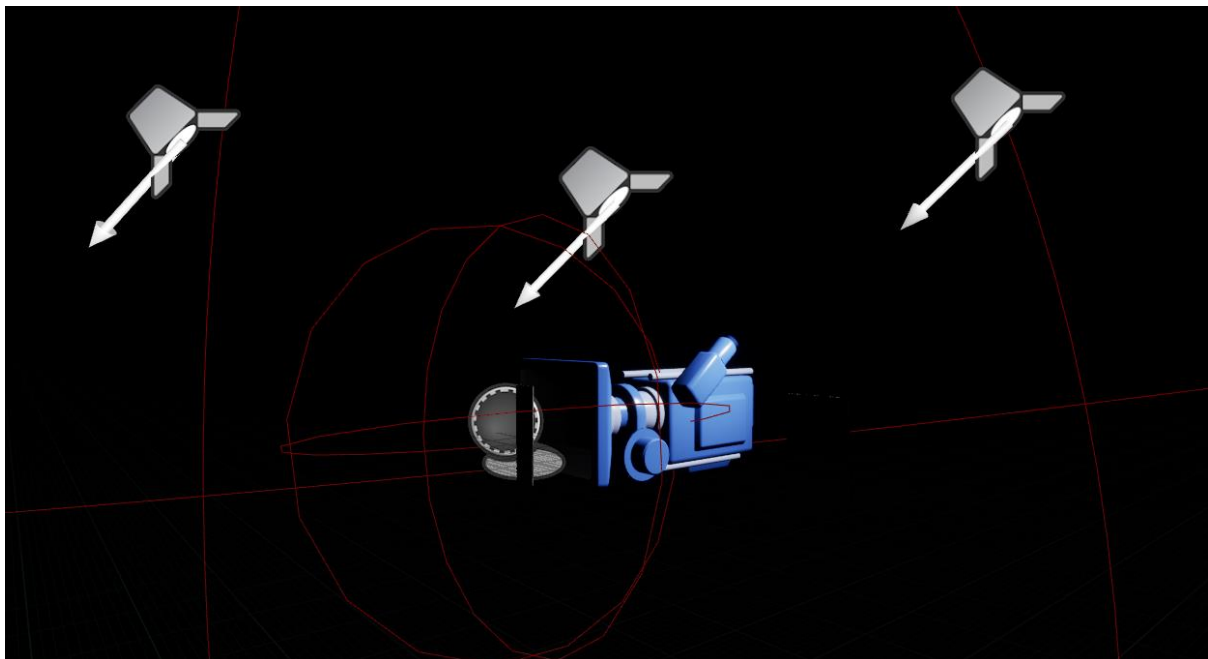
The fixed perspective system now allows for a cinemachine to be selected from the editor and dragged around as desired. Piloting the camera has been helpful to get a better idea of composition.

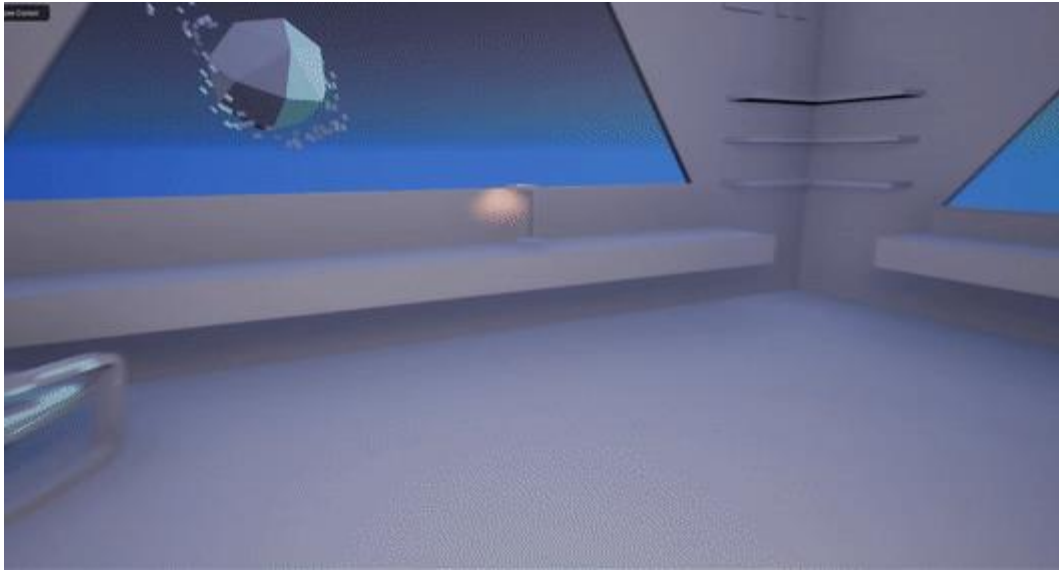
The **note system** was an interesting challenge to implement, the text should ideally be editable for each note. Scene captures were used to make the master blueprint note a texture, which was placed in a widget to spawn when the note was interacted with.

If the master note blueprint is rendered with a scene capture component, with the blueprint text visible, it would need a new scene capture for each new note. Capturing the note blank and spawning text on top in the widget, based off the exposed variable might be better and allow for more modularity.

Typing the text in requires `<br>` for line breaks, which was slightly confusing at first.

The main issue with this system currently is the rendering of the scene capture. To make it look pleasing, it was be done in an enclosed dark room, with adequate lighting, utilise the three-point system ([www.youtube.com](http://www.youtube.com), n.d.) and loaded into the game. The dark room should be always hidden and out of the way from the player's view.

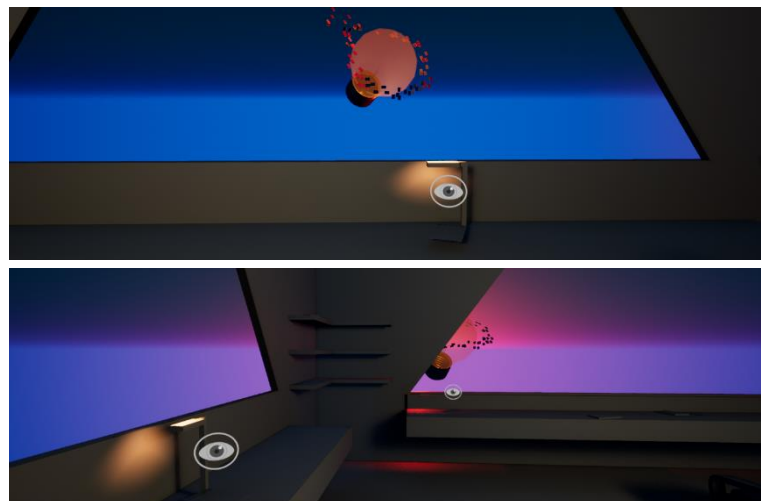




### Signalling interactability and tutorial

Next was the making of an **interact icon system** (which was made more efficient due to the research done earlier). To signal interactability, an eye icon (a 3d widget inside the note blueprint) floats above the notes and rotates with the player's gaze (if they are in an interactable range).

The eye was made in Photoshop, with basic shapes. Though as of now, it does not make the notes visible enough, so an outline over them should also be considered.





# TUTORIAL TEXT VISUAL ITERATIONS

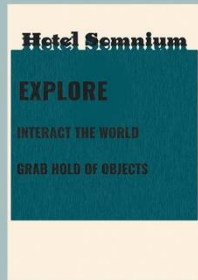


INSPIRATION FROM GRAVITY BONE'S OPENING SCENE, WHERE IT TEACHES THE PLAYER THE CONTROLS IN WORLD

## ENGINE TESTING FOR SUITABLE SCALE



### INITIAL DRAFT FROM AN ADOBE TEMPLATE



BLOCKED OUT MAIN PHRASES



REMOVED DISTRACTING BACKGROUND TEXTURE, ADDED A SECTION AND TUTORIAL IMAGES

Tested in Engine for the first time, to get a sense of scale needed to be noticeable in world as a poster, instead noticed the writing was barely visible due to poor contrast.



FIXED GRAMMAR ERRORS, CHANGED THE COLOUR PALLET FOR A MORE RETRO AESTHETIC (TO ALSO FIT THE OVERALL CHEERFULL COLOURS OF THE LOBBY) AND TO CONTRAST THE BLACK TEXT MORE.



CHANGED MOUSE ICONS TO BE MORE READABLE AND ROUNDED, REPHRASED AND MADE KEY WORDS ENLARGED

## Hand Interaction Visuals



Original image from [www.flaticon.com](http://www.flaticon.com)



First edited iteration tested in game. Pink with a brain texture to further allude to the game's setting.



Second iteration. Deciding to opt for a more simple clean look as the pink clashed too much.



Final iteration. Added a bit of polish, in the most literal sense possible.



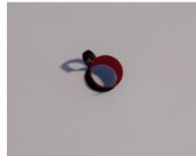
Inspired by Amnesia and Soma, I wanted to signal to the player, they could interact with the door. It shows only when the character is in an interactable range by changing it's visibility based on a line trace hit event. The line trace loop event ends once the player has left the interactable radius, then failing the success check for its visibility.

## Implementing Physical Interaction System

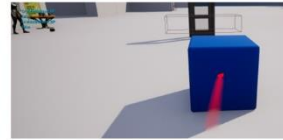
### Physical Interaction System

#### Issue:

-held objects can sink into the floor when player looks down

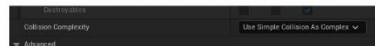


-Only moves on interact if slightly pushed first



#### Fix/

Improvement: - The collision was changed in the static mesh from Project Default to Simple as complex  
Though the edges can still overlap slightly in some cases if the player forces the object against the floor.

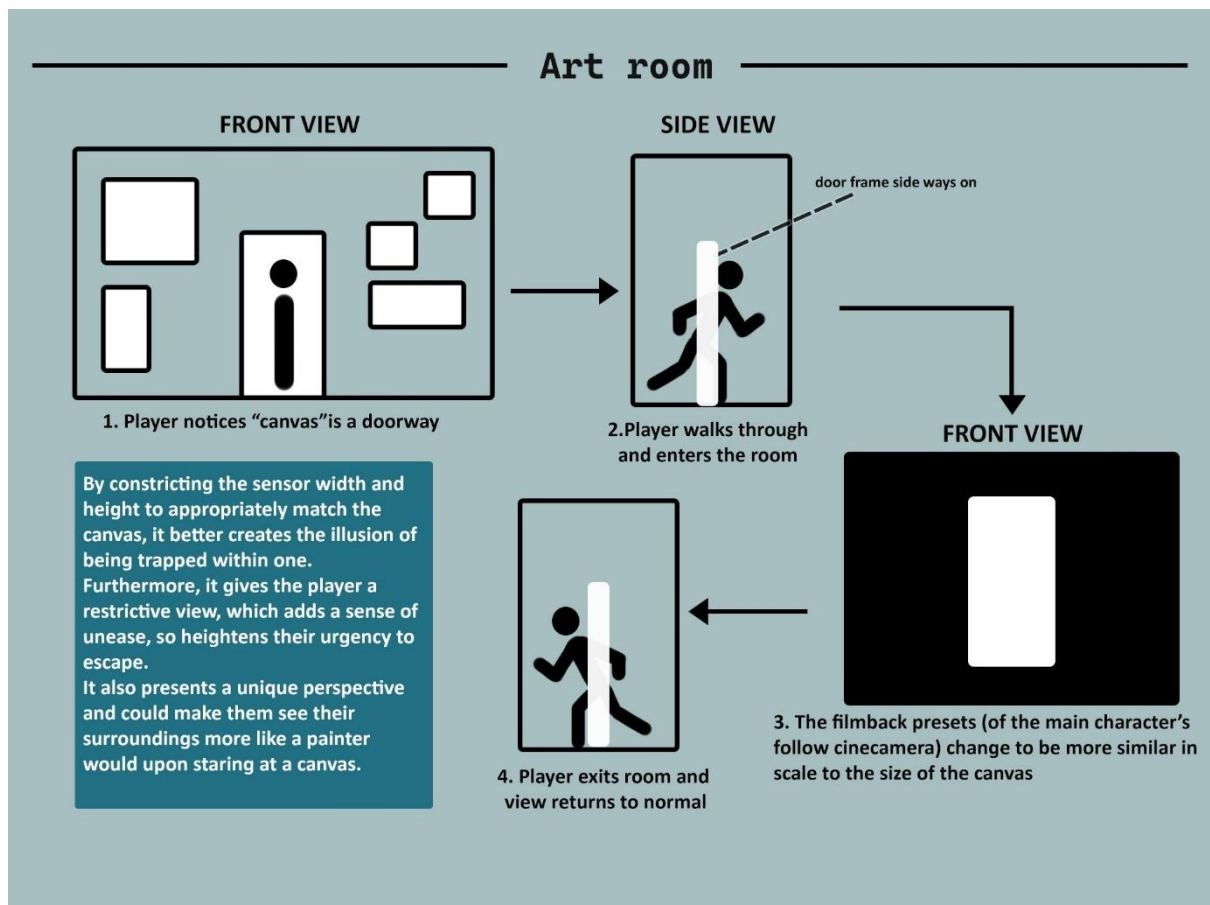


-After a lot of node experimentation I tried wake all rigid bodies on a timer and it fixed the issue. It seems this is a common issue in Unreal Engine 5.

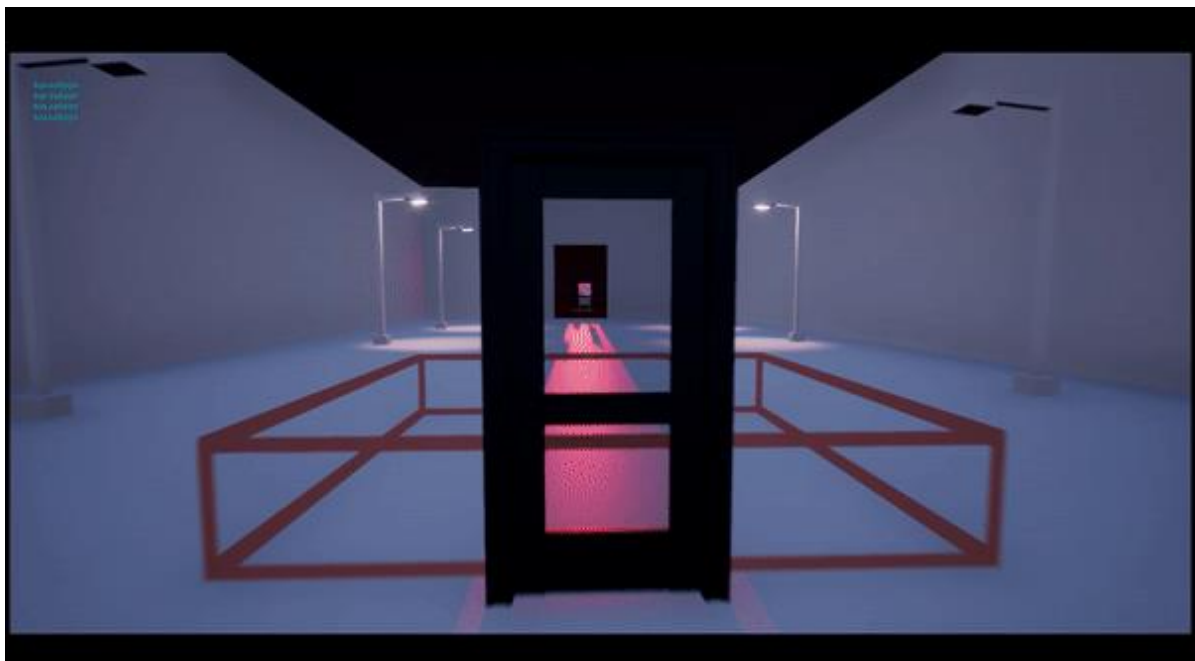




## Filmback adjustment Blueprint for use in the art room

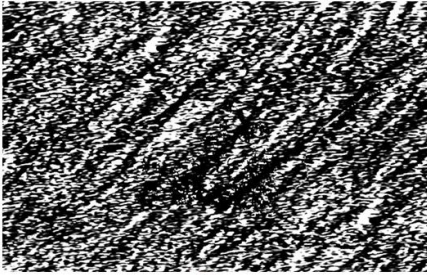


## Example blueprint demo for the concept above:



# Canvas Post Processing

## Iteration 1



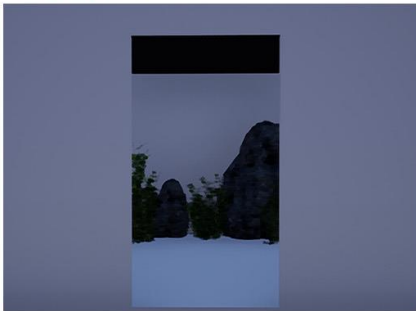
No blend radius, so transition was jarring and too sudden. Furthermore did not convey to the player that it was a painting/drawing.

The effect itself I found to be too scratchy and whilst the blend weight and parameters could still be adjusted, it was not as subtle as I desired.

After blend radius was applied there was a distracting and disorienting noise effect before the player overlapped the post process volume.



## Iteration 2



The “Kuwahara” filter was used instead and the blend radius was increased so from a distance players could still tell it was a painting.

I am now happier with the subtler effect and in the final version it will look out upon the field of dreams, as foliage seems to respond well with the filter and create the desired calming effect

An tutorial by Kodeco, helped me to better understand how this filter achieves the results. However, I did not create this effect only implemented and researched.

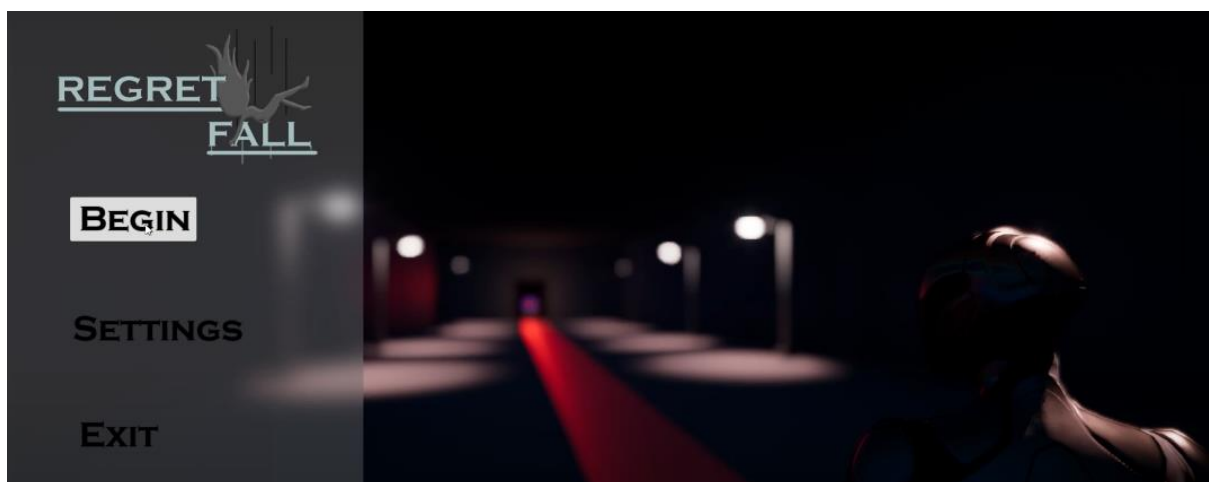
Occasionally upon exit the transition back to the original filmback wasn't smooth (it distorted temporarily before returning to the original view). However, after adding a delay, interp and changing constraints, it seems to have been resolved.

## Menus

A simple **main menu** was implemented in a level blueprint, so that when played a camera would pan out to view the player character and play music.

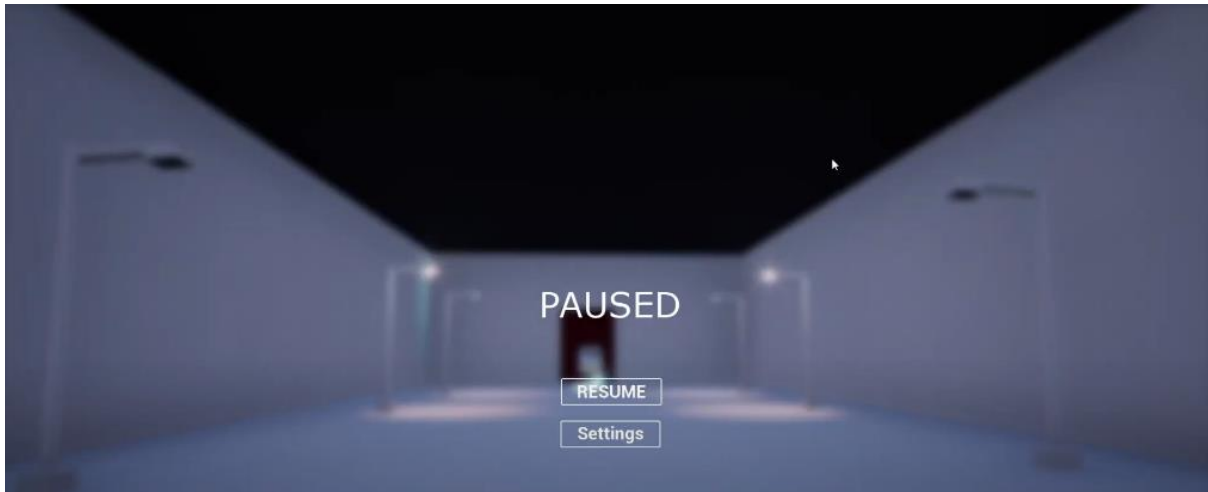
Initially the buttons were on the right side but after seeing other main menu's, the decision was made to flip the player and the buttons, due to it being more unnatural and irregular in

games to be on the right. Player's might find it more disorienting to navigate if it was left this way.



A **settings menu** is also present from the main menu and should be from the pause, though currently is not linked. Currently it just adjusts the master audio.

At first, there was a glitch where when the volume was adjusted to 0 on the slider, it kept looping only for a few seconds. This was shortly fixed (Unreal Engine Forums, 2018) by changing the visualisation mode to play when silent in the audio component.



A simple pause menu was also made so users can take a break if needed. Initially there was a struggle, as the pause button when pressed again once the game was paused, did not unpause the game. After some research it was fixed by ticking "Execute when paused" on the event.

## Sun timelapse

# Sun timelapse

### In Engine (test level) set up



The improved camera blend system (more easily moveable) allowed for more experimentation with aspect ratios.

Uses an aspect ratio of **2.37:1**, as research of "Big Screen Cinema" highlighted that it often ranges from **2.35:1** to **2.40:1**

### Future plans:

- to add **music**, have a more **fatigued walk** animation in this area
- **Push objective** - have them fall over half way through and get back up

### Lighting:

- took a decent amount of testing to produce a satisfactory silhouette
- rotating the sun in the more realistic way meant the sun did not line up with the player and had to be timed perfectly with movements. Since its constrained to one axis, it guarantees it will line up.

### Inspirations and aim



Inspired by many movies silhouette wideshots, such as Mad Max Fury Road and Lawrence of Arabia, this system should heighten emotion in negative space and manipulate the sun's rotation to allude to the passing of time.

Getting the lighting right for this scene, to produce an appropriate silhouette but also so the sky atmosphere remains a sunset orange colour is something that needs to be improved upon.



### **3. Conclusions**

This development process has highlighted different methods of designing and conceptualising levels, which will be used in future projects. For instance, the importance of engineering the intended emotions you want the player to feel into Game Design (Barbara Gizycka) and creating an emotion chart (as Bioware did for Mass Effect 3).

Furthermore, the instability of chaos in Unreal Engine 5, despite having found workarounds for issues, has made me more observant and apprehensive of the physical interaction mechanic causing issues down the line. Though the implementation of this feature did highlight the importance of consistency of controls and prompted the change of the interact button from E to LMB.

In addition, research into fixed perspective highlighted many potential gameplay issues, such as the player becoming disoriented, so the decision has been made to place them only in transitional areas to avoid disruptions to other gameplay features.

Overall, the main takeaways:

- For fixed perspective, to not sacrifice playability for composition
- For design, to maintain consistency in features, feedback and emotions evoked and directionality

### **4. Moving Forward**

The process has highlighted some over scoping of initial visions and resulted in the creation of a more linear level. Designing a branching narrative would have taken considerable time and taken away from the other learning process embarked upon.

Now that many core mechanics have been established and designed, the blockout phase and implementation of systems working in cohesion can begin and making quality of life changes in the game, such as improved visual feedback for the physical interaction system.



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