



Faculty of Science and Technology

BSc (Hons) Games Design

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Creation of a 3D immersive game that uses mechanical storytelling to convey an emotional experience

by

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And finally, I would like to thank my friends and family for helping to believe in myself.

ABSTRACT

This project assesses the effectiveness of mechanical storytelling at eliciting emotions in games. To achieve this, it will be explored the entire production process that can deliver such as experience. The process consists of researching state-of-the-art game design techniques that enable the design by emotion. Secondly, the designs will be readapted to create a game that also fun to play. Thirdly, all the mechanics and visuals will be developed and implemented following an indie style pipeline. And lastly the prototype will be evaluated by 5 participants with a gameplay observation and interview approach.

The result shows different emotional responses and story interpretations from the participants. Those two outcomes are a result of the story resonating differently depending on factor as experience with similar games and personal preferences. Additionally, that framing devices such as audio and visual are fundamental to generate the right context for a major emotional impact.

The prototype presents a full 2.5D puzzle-platformer game developed in Unity 2019.4 using a combination of classic and modern development techniques to create a title with cartoony cell shaded style.

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1 INTRODUCTION AND BACKGROUND

1.1 INTRODUCTION AND RATIONALE

Interactivity is a key factor that distinguishes video games as a media among the others, this is because its dynamicity allows a more immersive connection with the audience. Ermi (2005) explains that this immersive potential is given by three main aspects: sensory, challenge-based, and imaginative immersion. A game presenting a good symbiosis of these three aspects can bring a stronger emotional experience.

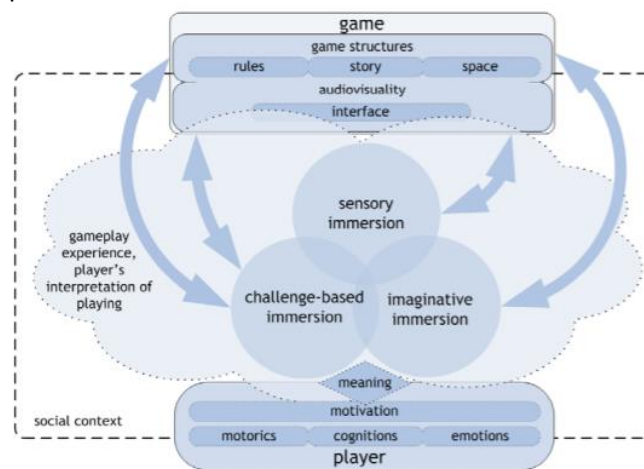


Figure 0: SCI- model (Ermi 2011)

Although, in the past there has been an apparent separation between narrative-focused games and gameplay-focused games in the industry. There are cases where gameplay and writing do coexist in the same game bringing a more uniform experience, this is called mechanics as metaphor or mechanical storytelling and blends the direct connection of interactions and ability to tell engaging stories crafted with narrative techniques.

Games such as *Flower* (Thatgamecompany 2009) and *Journey* (Thatgamecompany 2012) are emotion-based games that revolve on mechanics as metaphor to build emotional intensity, delivering an orchestrated experience that uses resonating elements to guide player's feelings.

According to Alex Mitchell (2020), to achieve the poetic effect designers need to defamiliarize certain game elements to create a poetic effect drawing player’s attention to encourage reflection “impart the sensation of things as they are perceived and not as they are known” (Shklovsky 1965).

This can be accomplished in different modalities, for example by subverting classic game design conventions as *QWOP* did with the controls mapping a limb to a button (Foddy 2008) or by subverting rules created by the game itself for instance in *The Witness* where an apple on the branch tells the correct answer and in the last tree the branch is broken (Thekla, Inc. 2016).

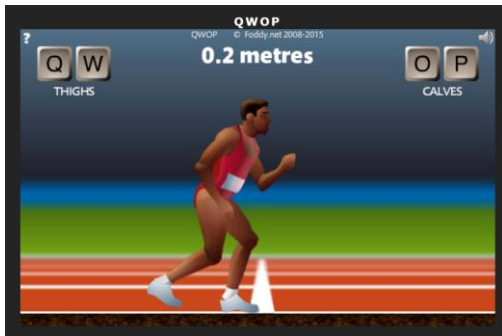


Figure 1: *QWOP* (Foddy 2008)



Figure 2: *The witness* (Thekla, Inc. 2016)

Game mechanics already have an intrinsic narrative and designers could take advantage of that to carry this narrative momentum by crafting a story that supports that. With the use of puzzle design, the game will benefit of the embedded narrative power of puzzle games which is the journey from uncertainty to competence. This mirrors the adventure of the game characters overcoming their difficulties giving further emotional impact.



Figure 3: Puzzle games emotional journey (Menzel 2016)

1.2 AIMS

The aim of this project is to generate a successful prototype that runs under a core theme and delivers an emotional experience using game mechanics as central delivery method.

In this project the player will explore the theme of companionship and experience a small journey that narrates through a variety of aspects surrounding it.

The following are the objectives support the above aim:

- **Research:** study of the state of the art, what visual style can be achieved in this period of time, and mechanically, what game design theories can support the planned game experience.
- **Story Design:** injecting the poetic effect in core mechanics to communicate story layers with a deeper effect.
- **Puzzle Design:** Crafting a series of nine well balanced puzzles that give a sense progression.
- **Character Design:** Creating the protagonists from drawing to 3D modelling that will fit with the story elements.
- **Level Design:** Create a series of three main environments that reflect three core aspects channelling the player to feel the associated emotions.
- **Development and implementation:** Programming the mechanics, importing characters with

animations and levels with interactions.

- **Evaluation:** Testing the prototype and its effectiveness on delivering the experience assessing its usability and how the story is perceived.

1.3 LITERATURE REVIEW

1.3.1 Game Design

1.3.1.1 GFI Framework

Similar to the MDA framework (Hunicke et al. 2004) MDA divides a game into three main modules: Mechanics, the rules and structures that control that game, Dynamics are the experience players are going through when playing, Aesthetics are the emotional triggers elicited in the player.

While for GFI the focus is shifted on player interpretation, analysing the foundation of narrating design. This is very indicated for this type of narrative application since game poetry can be abstract at times and can be interpreted differently depending on factors as audience playstyle.

In GFI (Goals Feedback Interpretation) Goal are used to motivate player intensions while Feedback is essential for structuring player's actions. Ultimately player's feelings are triggered by what players are thinking about, which necessitates an Interpretation of their experience of the game (Cardona-Rivera et al 2020).

There is still the two-way communication model used in the MDA framework but this time the focus is shifted on the narrative side for a better story delivery therefore an additional support for the story-focused design of the game.

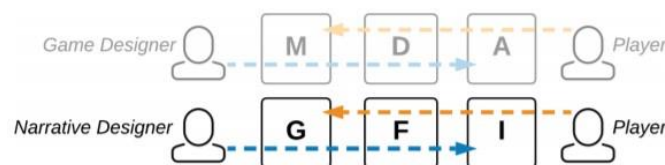


Figure 4: GFI framework perspective compared to MDA framework.

1.3.1.2 Lenses of Unification

This is a type of design that benefits of stronger cohesion since the whole game will be run under a core theme. All the surrounding elements such as level design, mechanics and music are designed to reinforce it. By letting all the game's elements to resonate it creates a more immersive experience and subsequently it will be easier to guide the player to the aimed emotion reaching the poetic effect.

This connects with another Schell's principle, The Lens of Resonance which will allow us to design sections of the game resonant to core emotions which will explored in each level as part of main theme, in this case companionship.

As Schell says, "When you manage to tap into one of these resonant themes, you have something deep and powerful that has a true ability to move people and to give them an experience that is both transcendent and transforming" (2008).

1.3.1.3 Diegetic Approach

Integrating the concept of diegesis was proven to improve the story experience (Brown et al 2020), where it is possible, this can be accomplished by incorporating user interface elements into the game world itself granting to the player a better connection with the game narrative, consequently a better immersion allowing us to elicit player's emotion successfully.

Although, there is to say that this is a powerful yet delicate tool and not indicated for all cases. Sometimes it might even cause the opposite effect if the communication with the player is not successful.

1.3.1.4 Emotion Engineering

According to Stéphane Bura (2008), player's interactions influence the game's variables state which in turn cause an emotional change to the player and finally, this change affects how player interacts with the game closing the loop.

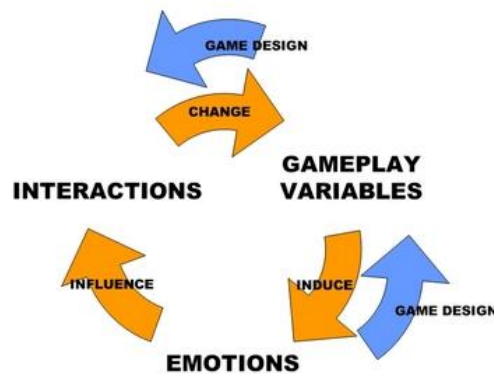


Figure 5: Cycle of influence (Bura 2008).

Based on previous work by Will Wright (wright 2003), this representation claims that all potential game dynamic structures can be classified into a multi-dimensional taxonomy.

	 Freedom	 Mastery	 Data
 Action	Opportunities, Tools and Abilities	Trained reflexes, Tactics	Game world resources and collectibles, Operational rules
 System	Exploration, Experimentation, Purpose	Learning skills and using them to gain more control	Preparation, Constitutive rules
 Self	Strategy, Creativity	Exploiting skills, knowledge and metagame data	Mementos, Achievements, Memories
 Social	Community support, Shared experience	Competition, Cooperation, Teaching skills	Status, Metagame, Implicit rules

Figure 6: Variables in Emotional Engineering (Bura 2008).

The table above illustrates Bura's approach, which includes what variables designers can use. Depending on the case vertical and horizontal variables can be paired and adapted to have an effect on player's emotions.

Eliciting emotions in games is a result of planned events. The experience will change from people to people. This means that not everyone will feel as planned in certain points.

With the use of emotion engineering, designers are able to frame certain emotions by using context where the player is able to relate. For example, *God of War PS4* is father-son tale that will be more effective to people who experienced fatherhood themselves (Santa Monica Studio 2018).

To achieve that, designers need to predict the emotions and adjusting those game variables creating the context leading to the wanted emotions. For instance, in *Resident Evil 7: Biohazard* (Capcom 2017) by tweaking the quantity of the ammunition found around the mansion the developers are able to turn from a horror experience to an action experience.

1.3.2 Puzzle Design

To successfully craft the puzzles, I will be adapting Jess Schell puzzle principles (2008). Which demonstrates common patterns shared in good puzzle designs. Briefly, in order they are:

- **Puzzle Principle #1, Make the Goal Easily Understood:** allowing to the player to understand the objective at first glance.
- **Puzzle Principle #2, Make It Easy to Get Started:** initial puzzles need to be simpler and easier to understand allowing the player to familiarize the with the game mechanics.
- **Puzzle Principle #3, Give a Sense of Progress:** this is given from how the environments changes by advancing with the game.
- **Puzzle Principle #4, Give a Sense of Solvability:** allowing to the player to understand how the puzzle works easily and make them able to differentiate its elements.
- **Puzzle Principle #5, Increase Difficulty Gradually:** as player progresses with the game, the systems composing the puzzles will gradually increase their complexity, avoiding major difficulty spikes.
- **Puzzle Principle #6, Parallelism Lets the Player Rest:** allowing the player to take a break on a specific puzzle and letting them progress on another route.
- **Puzzle Principle #7, Pyramid Structure Extends Interest:** allowing smaller puzzles to contribute to a larger one.
- **Puzzle Principle #8, Hints Extend Interest:** saving sometimes player frustration when puzzles become too hard, regaining their hope.
- **Puzzle Principle #9, Give the Answer:** ultimately if puzzles are unsolvable with the help of the hints, in some case it is wise to give the full answer.
- **Puzzle Principle #10, Perceptual Shifts are a Double-Edged Sword:** involving perceptual shift most of the time leads to player confusion and following frustration, this is due to the fact that they involve a lot of staring and often avoid visual progress or increase in difficulty.

Some similarities can be seen also in Shigeru Miyamoto's design of *Super Mario Bros.* (Nintendo EAD 1985) and *The Legend of Zelda* (Nintendo EAD 1986). So, some of those principles, with some adaptations are applicable as a way to teach game mechanics even though the game is not fully a puzzle.

1.3.3 Ludonarrative/Mechanics Metaphor

Ludonarrative undertakes several forms, the main rule according to Alex Mitchell (2020) is the defamiliarization of the player drawing attention to certain elements that are part of the narrative, this communicates a specific message with a higher impact establishing a deeper connection to the player.

Based on previous work by Shklovsky, Mitchell claims that defamiliarization is the “process of undermining expectations so as to slow down perception” (2020). The power of this method is that makes the player to take a moment a think on what happened in the game. Consequently, this approach allows designers to have more of visceral impact on players, helping on channel particular emotions.

The following are the forms explored by Mitchell:

- **Defamiliarizing Interaction:** this type ties with feedback following the input normally the player will expect the game to respond following conventions, usually involves movements.
- **Defamiliarizing Gameplay:** this involves the core mechanic or surrounding games mechanics, often involves a twist or multiple conflicts.
- **Defamiliarizing Agency:** the player expects to have a uniform agency throughout the whole experience, this involves often stripping the agency and relies on the trust gained by the player progressing the game.
- **Defamiliarizing Time:** breaking the expected time boundaries by looping the time or flashbacks are most common ways, another approach is to subvert the power of saving function of a game.
- **Defamiliarizing Boundaries:** generally breaking of the fourth wall mentioning either real world elements or other games elements, although this could cause conflict with the “magic circle”.

1.3.4 Game narrative

The story will be designed by using Aristotle narrative division, the Three Act Arc structure, this type of division is commonly used in many media, especially in games, dividing the entire story into three core acts. Which is the following:

- **Act 1 “The Inciting Moment”:** This will be the “hook” of the story and will need to elicit curiosity to progress.
- **Act2 “Dramatic reversal”:** a change of direction to the story, a raise of a problem that bring unbalance to the story.
- **Act 3 “Climax and resolution”:** reaching the peak of the drama with the story resolution or an irreversible “dramatic reversal”. This part tends to answer most of the question generated before.

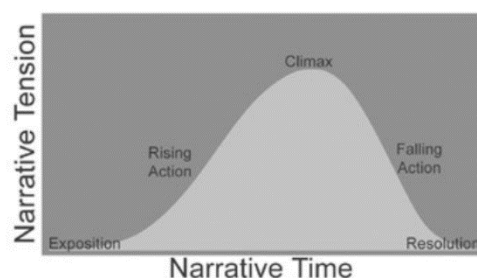


Figure 7: Classic dramatic arc (Fullerton 2014).

1.3.5 Case studies/Inspirations

- **Shadow of the colossus – Using the core mechanic as a communication tool:**

Sometimes ludonarrative emerges in certain parts of the game to support the core theme of the game as in *Shadow of the Colossus* (Team Ico 2005), which breaks the core mechanic, stabbing the colossi, into two separated steps. Once button is used for raising the sword and then press it again to finalize the action as also stated by Alex Mitchell (2020). This puts in the spotlight the moment of the stabbing, suggesting to the player that it is not a “standard action” and emphasizing the struggles of the game character that finally manages to land the hit.

- **Braid – Subverting game world rules:**

A powerful element of defamiliarization, that usually let the player build an understanding of the game world before it takes place. For example, the player in world 2 will need to get some of the puzzle pieces and a consequence will familiarize with the basic game mechanics. After two certain pieces that portray a in game platform are acquired and placed in level 2-2, the player can see appearing an actual platform game world. This breaks some of the precepts established in the player’s mind about how puzzle pieces could work and thus drawing attention (Jonathan Blow 2008).

- **Journey – Design by emotion:**

The game is an immersive fable centred on seeking comfort in the hands of others as the player embarks on the proverbial hero's quest, and it used music mechanics and plot framing devices to construct the atmosphere. Chen describes how the developers used a meticulous eye to outline the emotional arc of the game, whether it is the spatial geography, colour scheme, fluidity of the mechanics, or pacing.

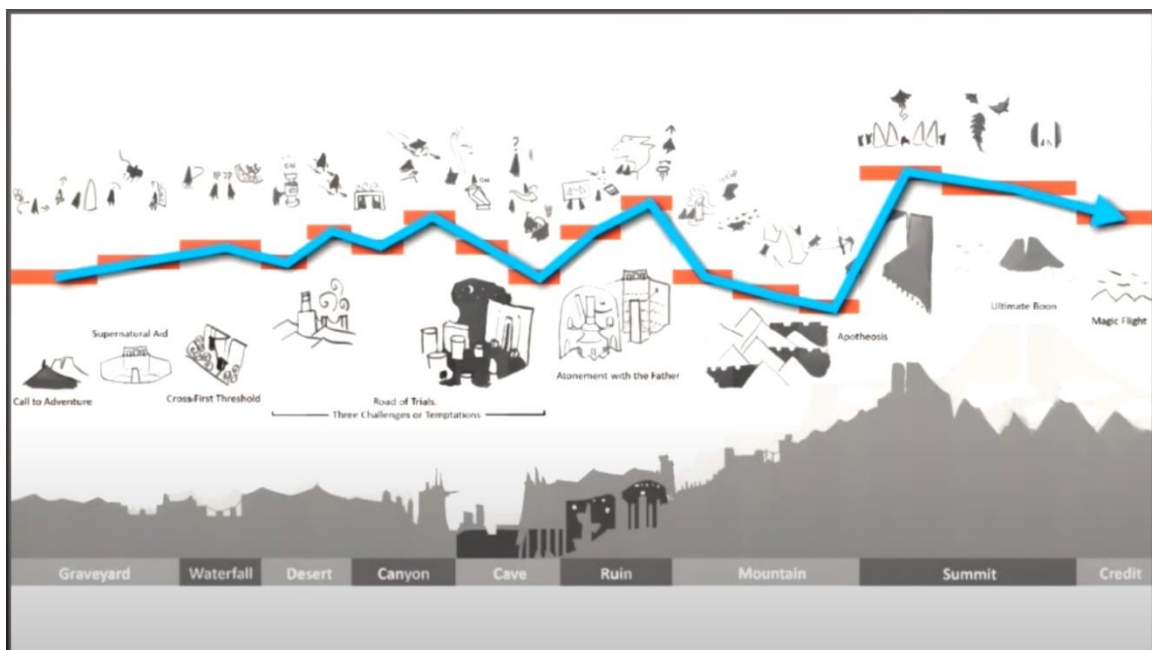


Figure 8: Journey’s dramatic arc (Chen 2013).

Chen also explains that through the entirety of the game is about movement and freedom, this also a metaphor of the main character wellbeing which at times restricted or overpowered and finally will be reflected in the player emotions (Chen 2013).

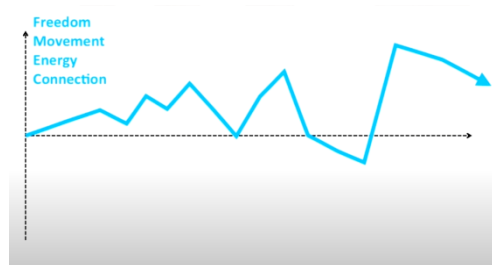


Figure 9: Journey's emotional intensity graph (Chen 2013).

2 METHODOLOGY

2.1 GAME DESIGN

The game follows the principle of “design by emotion”. Mechanics are crafted as emotional centrepiece which reflect the intended emotions. The game elements will be unified supporting this central feeling at a specific time. When the design occurs, the GFI framework and Emotion Engineering will be applied to adjust the context that influences the emotional delivery.

2.1.1 Game Overview

The prototype is a 2.5D puzzle platformer game and presents the classic controls used in platformer games with jumping and moving left and right, in addition player can activate with objects and push boxes and rocks. The player controls the main character, “the boy”. The secondary character, “the girl” can be moved by holding hands.

The game is composed by three types of environment:

- Forest/field: three puzzles
- Underground dungeon: four puzzles
- Temple in the sky: two puzzles

To finish a puzzle the characters must arrive at the end of the area.

2.1.2 Mechanics as metaphor

In addition to standard mechanics that serve standard playability, mechanics as a metaphor will be used as a way to communicate to the player certain concepts by using interactions improving impact of certain messages to the player.

The following are examples used in the prototype.

Holding Hands:

One of main mechanics to solve puzzles, by holding shift the characters physically hold each other hands. This humanize more the characters, but it is also a metaphor of the connection between the two beings. Besides, builds more empathy as the player will physically holds the button, this may result as an annoyance and a constant reminder that the player is taking care of the girl.



Figure 10: Holding hands mechanic.

No magic powers:

In level 2, the boy and the girl will be separated due an unavoidable casualty. In this circumstance the player cannot use the girl abilities. By leaving objects that used to interact with the girl “teasing” the player. This ensure that the player knows that something happened to the girl and also becomes as a metaphor of loneliness. In addition to that the player know has to a different way to solve causing the player to miss the girl even more.



Figure 11: Portal with no power.



Figure 12: Teleport with no power.

Composable stone portal:

This mechanic, reformalizes the use of the portal by subverting how the portal originally works but still making sense to player in term of its use. For this in order to work information are gradually introduced to the player.

Firstly, its basic functionality, portal equals to a new level. Then, on puzzle 3 the box mechanic will communicate objects can be pushed. After that, the player is introduced to the rock pillar on puzzle 5 with the rest of the door being next to that, the player naturally will try to push the pillar into the portal trying to fill the negative space, but it will not work because the girl is missing. Finally, on puzzle 8, all the previous hints tell the player what to do to make it work.



Figure 13: Portal becoming a metaphor of coming together.

This is a metaphor of the two characters finally coming together to triumph over their difficulties. As they need both physical (of the boy) and magic (of the girl) abilities to finish the puzzle.

The very long ladder: inspired by a similar use in *Metal Gear Solid 3: Snake Eater* (Konami Computer Entertainment Japan 2004). The mechanics here will surprise the player with an unexpectedly long ladder. This is a metaphor of the character finally overcoming is struggle since the ladder itself symbolizing the final threshold before finally finding the girl in the new level.



Figure 14: Ladder becoming the metaphor of character struggles.

Orb power up:

After the player reunites with the girl on puzzle 8, they are able to access to this new power. The girl now can teleport without the constraint of finding a teleport stone. This gives much more mobility and signify the girl becoming stronger after her struggles. In this case the extra mobility is an allegory of the girl becoming stronger after conquering her struggles.



Figure 15: The red area is the teleport range.

2.1.3 Interaction design

To inform that the player can interact with certain objects, those objects will glow when the player is in range communicating to the player dietetically without being too invasive.



Figure 16: Teleport showing non interactivity.



Figure 17: Teleport showing interactivity.

This also helps to communicate when an object is not interactable (or out of power). In the dungeon area, when the girl cannot be summoned, the sing will not glow, further enforcing the theme loneliness.



Figure 18: Teleport in puzzle 5 still not interactable even when player is in range.

Another form of communication was using negative spaces to tell the player that a certain thing is missing. As the ball and socket and the door and key.



Figure 19: Door missing key.



Figure 20: Door with key.

2.1.4 Magic Circle

The game enables the magic circle creating suspension of disbelief utilizing the opening and closing elements with a “theatrical effect” allowing player to be more immersed in the story.

For the intro, the player descending into the level, with the game title, this impacts the player to get their initial attention but at the same time is being kept integrated with a diegetic transition. Then the game title will fade out one the player arrives in the crystal.



Figure 21: Game intro.

The outro follows more a conventional style with the credits rolling and musing in the background signalling the closing of the narrative arc.



Figure 22: Game outro.

2.1.5 Puzzle design

The player will be allowed to progress once a puzzle is solved. The player will need to interact with some specific objects placed in the midground in order to solve a puzzle.

The following are the types of interactions, by concatenating them it creates different types of puzzles:

Teleport: by interacting with it the player can teleport the girl to them.



Figure 23: Teleport.

Teleport orb: a variation of the teleport above, but this time the player can throw the orb before the teleportation increasing the range where the girl can teleport, after teleport the girl will walk and interact with the closest intractable object, such as lever and press pad. To inform the player about the throwing a cursor will appear.

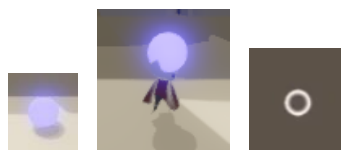


Figure 24: Orb Mechanic and custom cursor.

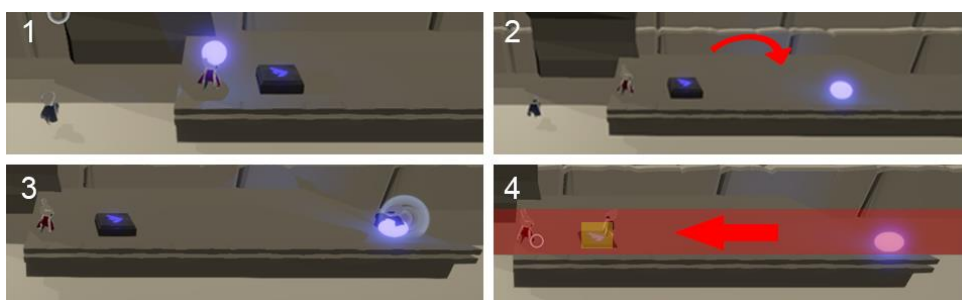


Figure 25: Girl moving on interactable sequence.

Press pad and moving platform: by standing onto the press pad, a related moving platform will move to a secondary position.



Figure 26: Press pad and moving platform.

Orb socket: it contains the orb; in exchange it activates something else such as moving platform.

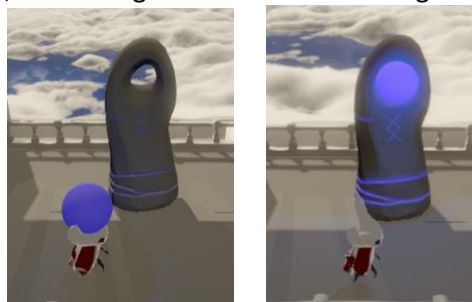


Figure 27: Orb socket.

Lever and destroyable platform/object: when activated the lever will destroy a related element which is connected by a glowing tube.

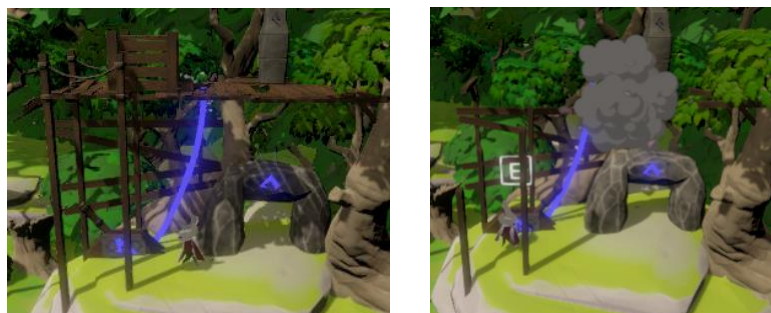


Figure 28: Lever destroying a platform.

Door and key: to open a door the player must collect the key; the key can be in one piece or scattered in the level.



Figure 29: Door and key whole (middle), key fragment (left).

Pushing box/stone: player is able to push certain elements that can be used for platforming or

activating the press pad.



Figure 30: Pushable objects.

Ladder: used to reach platforms in different heights.



Figure 31: Ladder.

Portal: this indicated a way to progress to next level. It will be placed with a passage when the girl is not present.



Figure 32: Portal, puzzle 3.

The following will demonstrate how Schell's puzzle design principles (2008) were adapted in the game.

Puzzle Principle #1, Make the Goal Easily Understood:

There are two instances of definition of goal in the game, the first one is thought in puzzle 1 and is the rock portal.



Figure 33: Portal, puzzle 1.

Even though the player is not explicitly told where to go, the situation was designed to passively communicate that using the puzzle structure. The communication of this can be broken down in three factors. The first uses the door convention. Using the fact that this is shaped as a door tells the player that it might bring them to somewhere, a typical interaction in similar games.

Secondly, it uses another convention commonly shared in platformer games communicating to that the player that they will need to move from left to right to progress. This is taught right at the start, when the player is starting by facing right and there is negative space inviting the exploration. This comes especially useful later when the passage is used instead of the door.



Figure 34: Initial screen breakdown.

Lastly, to solve a puzzle, both the boy and girl must stand on front of the door. So, to teach to the player this mechanic I have placed a teleport on top of the door with a breakable platform.

The player must activate the moving platform to reach 1, then teleport the girl on 2. After that there is no way for the girl to move out of the platform unless the platform gets destroyed. Now, the only action available to the player is to break the platform using the lever (3) making the girl fall inside

the door range. At this point, the player will want to reach the girl that now is on 3 as nothing has happened yet. As the player enters the door trigger area the puzzle is completed, and the teleport animation will be activated.

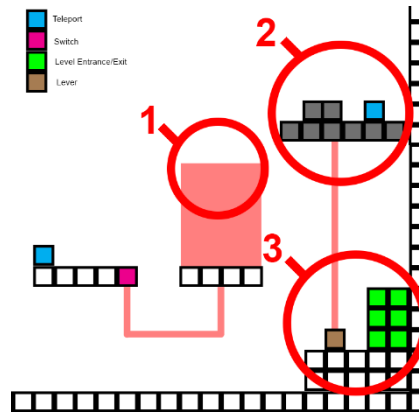


Figure 35: Puzzle 1 end.

*The teleport on 2 will not fall as the platform gets destroyed.

The second goal is introduced on puzzle 4, this time there is a passage instead of the door. The first time is introduced with the player falling into it while the second time will be reconfirmed in puzzle 5 so the player understands that there are “other ways” to progress.

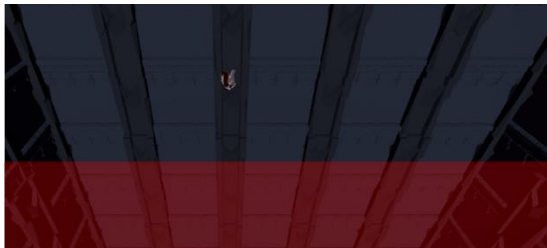


Figure 36: Passage illustration.

*The red areas on the figures below indicate the “passage” which trigger puzzle completion instead of the door.

Puzzle Principle #2, Make It Easy to Get Started:

In the example below, the starting puzzle (left) is rather easy so the player can easily learn mechanics, movements, and puzzles without getting to much challenge. Those puzzles where crafted with the notion of stopping the player if a mechanic is not fully learned. For example, in figure 37 the only way to arrive onto the top right platform is to master the press pad and moving platform interaction.

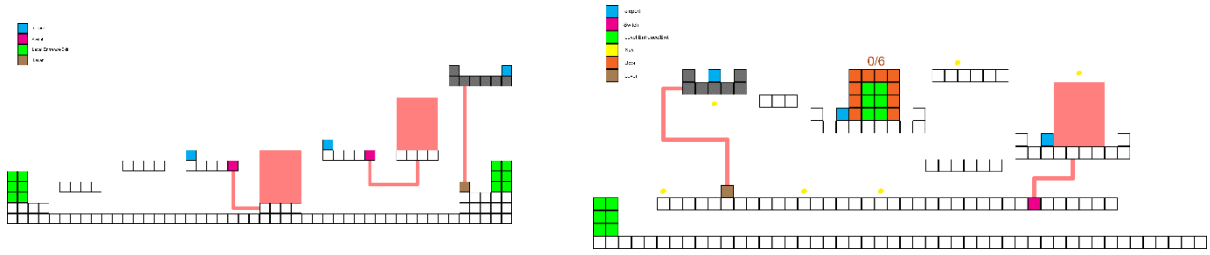


Figure 37: Puzzle 1 (left) and puzzle 2 (right).

Puzzle Principle #3, Give a Sense of Progress:

This is communicated to the player by the “progressing convention in platformers” mentioned before but also with the use of different environments as player advances through the game world.



Figure 38: Levels’ progression.

Puzzle Principle #4, Give a Sense of Solvability

All the interactable elements share a glowing part on their design signifying their interactivity, this also makes them stand out on the environment. This is reflected on the variety of “puzzle pieces” which, after the first approach, will immediately tell the player what part does what. Each piece was aimed to be visually different but also perform a unique action so the player can quickly differentiate them.

For example, moving platforms are only activated by pushing the press pad. Also, cogs will rotate on activation and also ropes connecting the two.



Figure 39: Moving platform visual cues.

Puzzle Principle #5, Increase Difficulty Gradually:

This is applied on the initial puzzles which are simple and approachable are in comparison to the next ones. First, the player will need acknowledge the interactions by introducing a few of them. As they progress, more elements are added that also interlock with some of previously introduced. This, will gradually increase complexity and also keep a constant challenge without boring the player keep the notorious flow state (Csikszentmihalyi).

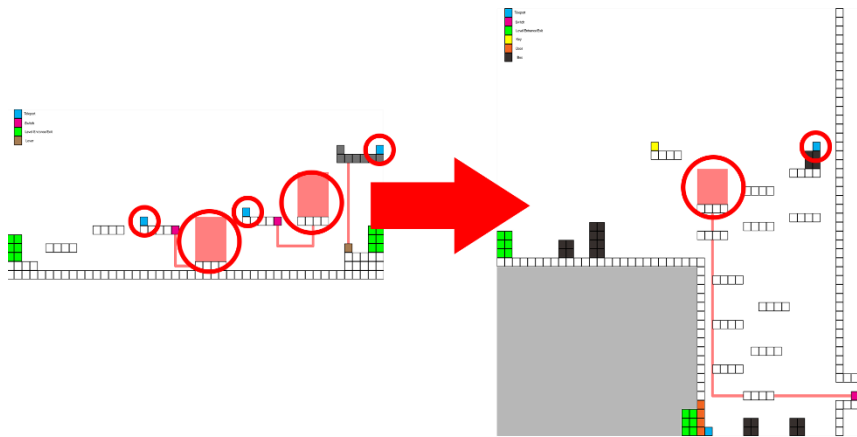


Figure 40: Recurring mechanics.

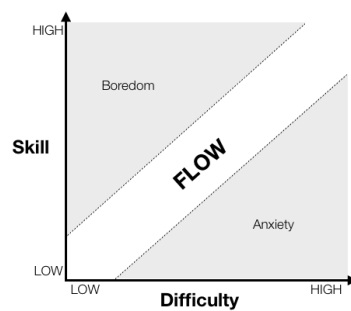


Figure 41: Flow state graph (Baron 2012).

Puzzle Principle #6, Parallelism Lets the Player Rest:

This principle is not present in the prototype because of the structure of the game being linear.

Puzzle Principle #7, Pyramid Structure Extends Interest: this often a consequence of having parallelism, hence will not be part of the prototype.

Puzzle Principle #8, Hints Extend Interest:

This principle will not be included as there are not excessively complicated puzzles.

Puzzle Principle #9, Give the Answer:

Same reason for the principle above, this will not be applied.

Puzzle Principle #10, Perceptual Shifts are a Double-Edged Sword:

There will not be any perceptual shift puzzles in the game because of the nature of the puzzle themselves, by following the previous rules the game automatically avoids the creation of such puzzles.

2.1.6 Character Design

The characters design was originally inspired by *Hollow Knight* bugs (Team Cherry 2017) and *Journey* travellers (Thatgamecompany 2012). Additionally, they also carry an inner symbolism. In fact, their heads shapes were planned to complete each other reflecting the fact that they have to work together to progress their adventure.



Figure 42: *Hollow Knight* Concept art (Team Cherry 2017).



Figure 43: *Journey* Concept art (Thatgamecompany 2012).

- The Boy: is meant to reflect the more physical part of the game hence his way to interact with the environment.
- The Girl: present more of a spiritual side of the game thus her magic powers. She has a crystal on her head indicating her connection to the ancient technology.

After the initial sketching, the characters went through a body correction more faithful to anatomy standards. The bodies were also optimized to meet the deadline. Therefore, they use the same body type. Then modelled using a low poly style. The meshes were modelled using box modelling technique, starting from a cube, and then extruding all the way to complete the body. Ultimately the body parts were separated to ease texturing. The poncho is a separate model that uses Unity built-in cloth component which in fact reacts to physics-based movements. Ultimately the rigging and animation were handled by Mixamo.com.

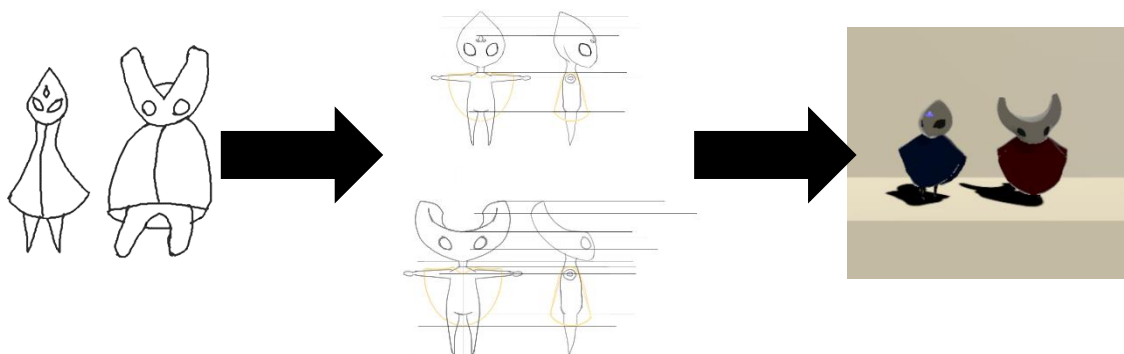


Figure 44: Characters creation pipeline.

2.1.7 Story Design

The base story model was designed following the classic “save the princess” archetype where, the hero, the boy discovers himself in this mysterious land and finds a girl trapped in a crystal. The concept behind the story is the companionship between these two beings belonging from two different realities, “the boy” from more of a natural world whereas “the girl”, from an ancient mysterious civilization, frozen for eons inside a bounding speel for an arcane purpose.

Both characters will need to overcome their differences by learning how to face their differences and communicate with each other, so they can surmount their difficulties with cooperation. The story then takes a loop direction converging the beginning with the end events with a final twist revealing that the girl gets again unexpectedly frozen with the boy being the responsible.

2.1.8 Level Design

The levels were designed to reflect and amplify the different emotions of game story. This can be seen in aspects as colour palette, pacing, mechanics, and the physical journey of the main character.

- **Level One, The Discovery of a new relationship:**

In this part, the elicited emotions are freedom and spirit of exploration. The player's avatar (the boy) will meet with "the girl" for the first time. The environment in this part will be relaxing and open space forest with some ruins around suggesting that an ancient culture used to be there. The player will be allowed to familiarize with the game mechanics and explore the game world at their own pace. The puzzles will be generally simple for the same reason.

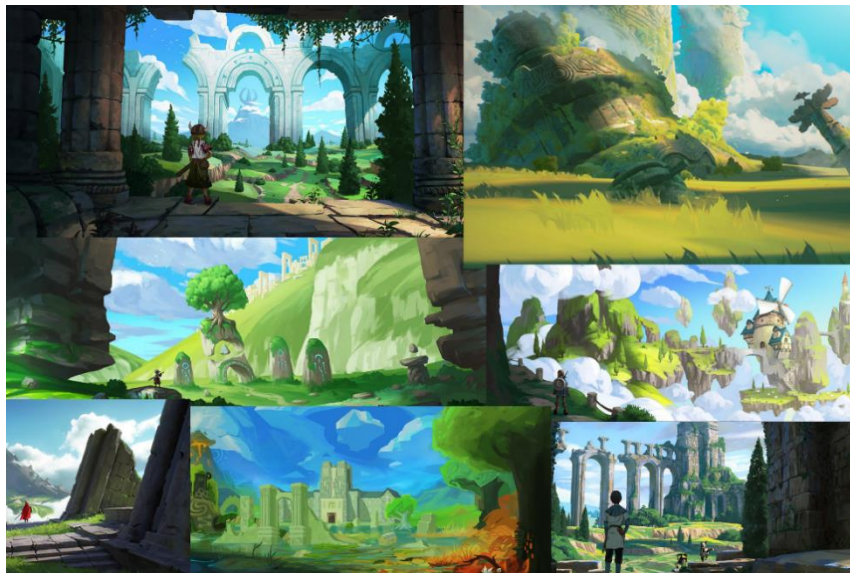


Figure 45: Level one, Mood board.

- **Level Two, The Sorrow of separation:**

In this part the focus is on elicit loneliness and sense of oppression. The girl will be taken away from this part by a major event, so the player will be left alone, and they will need to overcome the obstacles without the girl magic powers. Therefore, the puzzles will need more backtracking. The environment, a dark and claustrophobic underground dungeon, reflecting the mood of player going through their struggles.



Figure 46: Level two, Mood board.

- **Level Three, The Joy of coming back together:**

This will elicit a sense of transcendence and resolution. The boy and the girl will finally reunite, they girl will gain new abilities as a result of overcoming their previous struggles. The puzzles now will require a combination of all the knowledge gained in the previous experiences. The environment will be an open and aery sanctuary inducing a sense of relief.

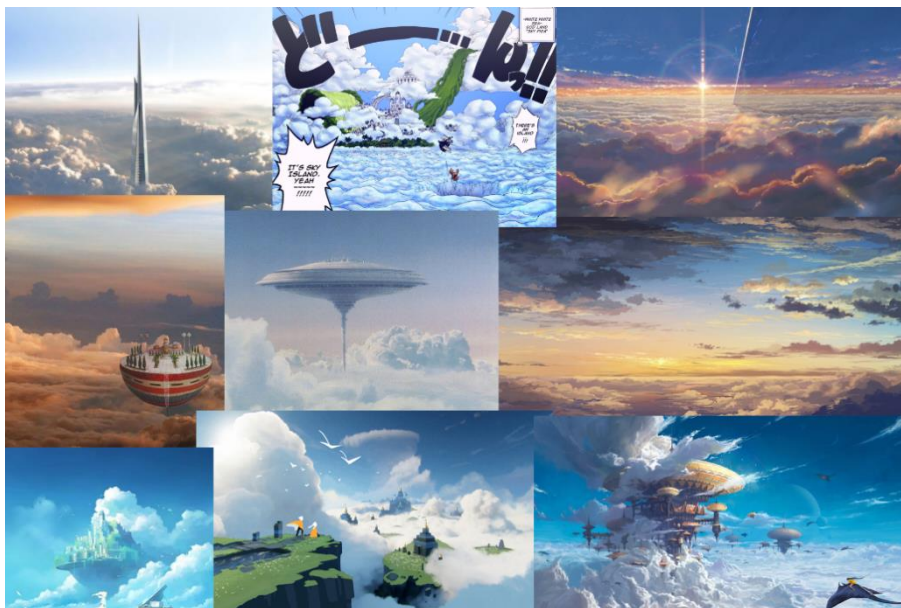


Figure 47: Level three, Mood board.

Inspired by *Journey*, the environment will reflect the emotional intensity of the story segment by changing colour palettes. Zammitto (2005) also suggests using colours as a way to convey emotions since colours are related to a variety of symbolisms and connotations between various cultures around the world.



Figure 48: *Journey* levels progression.

For example, the use in the main colours of levels inducing similar connotations.



Green	Nature, fertility, fecundity, balance, youth, also water. It induces to tranquility. [4, 22] In western culture, money. During medieval age, brides married wearing green as a manifestation of her fecundity. See figure 4.
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Figure 49: Level one, and green's emotions Zammitto (2005).



Blue	Cold, peace, depression, sadness, relax, calm, piety, wisdom, introspection, solitude, loneliness, contemplation, distance, infinitude, emotion control; it represents water and the sky. [1, 4,16, 22, 24] Spoils appetite.
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Figure 50: Level two, and blue's emotions Zammitto (2005).



White	Light, purity, innocence, cleanness, cold. Western bride wears white to represent her chastity. See figure 4. In China it represents Autumn.
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Figure 51: Level three, and white’s emotions Zammitto (2005).

Additionally, I was able to combine the colour design with player’s elevation using the level morphology to further support the emotional delivery.

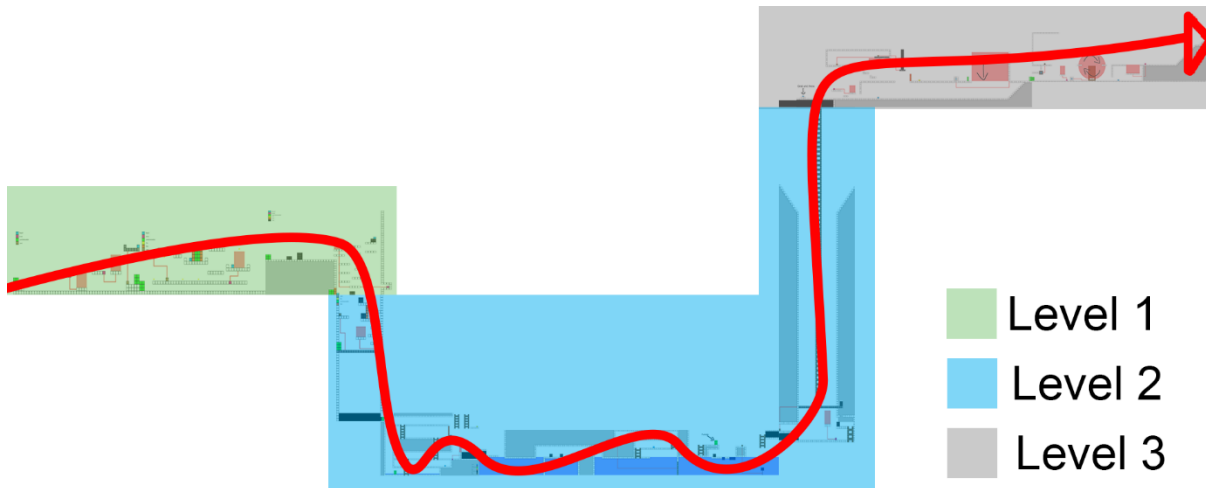


Figure 52: World progression.

In the image above, the player starts in a medium height (level 1), then goes down the dungeon (level 2) and finally rises even more to the maximum height point (level 3).

This will be based on Lopez’s block buster intensity graph (2008) for the three act arc narrative structure following a “emotional roller-coaster” synchronised with the story.

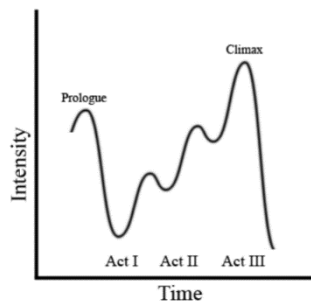


Figure 53: block buster intensity graph (Lopez 2008).

This, once more, can be seen in *Journey's* take of the proverbial hero's journey.

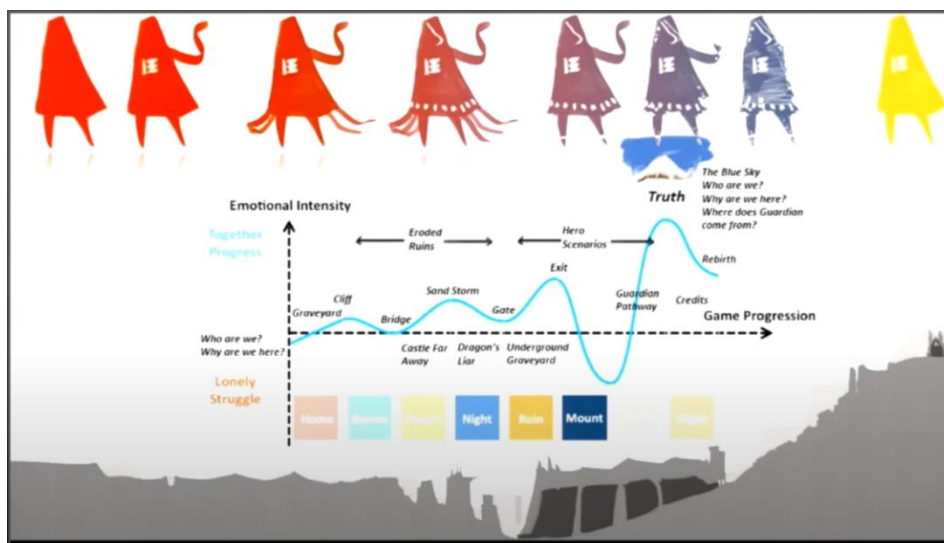


Figure 54: *Journey* intensity graph (Chen 2008).

2.1.9 Sound Design

The game presents standard sounds commonly used in similar games but there are some exceptions used to improve communications and “game feel”. For example, the key fragments that will increase of one pitch every time one fragment is collected giving a pleasant sense of progression.



Figure 55: Key Fragments Sound design.

Or another application can be found when the boy touches the water. To achieve this there are colliders on the character feet that will play a sound a particle effect on collision with water and additionally the water splash sound has been randomised to sound more natural on human hear.

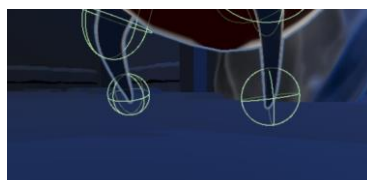


Figure 56: The boy feet collides.

The music was outsourced but still partially designed and supervised by me. This is because music is

quite important framing device that influences player's feelings. The main principle behind it is the leitmotif. The melody presented at 0:07 seconds in the first piece occurs at many points across the 9 pieces which carrying the main theme with small variations. Those variations reflect the environments and moods elicited.

2.2 IMPLEMENTATION

2.2.1 Technology Used

2.2.1.1 *Game Engine - Unity*

The engine used for the creation of the prototype is unity which was used to implement several things such as:

Level Design: this part is important to build the atmosphere which has a major impact on immersion. The implementation process was broken down into two main parts:

- **White boxing:** Here is where the 2D level design is transferred into a 3D area. Colour code will be used to identify the different puzzle interactive elements.
- **Detailed layout:** Here is when the props will be imported and placed in the scene. For the foreground and background (non-interactive areas) they will be simply placed, and any sort of colliders will be removed. Then the midground will be keep all the main colliders and the meshes will be placed on top the platforms. Then the interactable parts will be implemented in the code if animations are needed.

Later, I will add all the lighting needed, in this case, directional lighting for open area and a combination of point lighting and directional lighting for indoor areas. Lastly there will be implemented all the sounds and music with related triggers.

- **Terrain:** This tool was used only in puzzle three in the larger area. Firstly, a texture will be applied on large plane then I will mould the hills giving a more natural effect.
- **Shader:** the characters use a custom shader that gives them a more cartoony look, lighting will affect the models in a simplified, this will also add a rim light contour and eliminates any subsurface scattering. This also "hides" hard edges allowing better optimisation.



Figure 57: The boy cell shaded in detail.

- **Programming:** C# is used to implement all sort of elements in the game, those can be divided in:

- **Movements:** the character uses solely physics-based movements, achieving more control over the platforming elements such as acceleration and gravity, which is one of the core features.
- **Interactions:** this includes all the mechanics that requires player input to work. Unity uses modular components enabling to have major control over every single mechanics and their variation based on events and triggers.
- **Animations:** animations are controlled by unity animator and activated by the script with Booleans in most cases.
- **Audio:** An audio controller manages an array of sounds while for the music and ambient sounds are managed with separate objects allowing the transit them over the new scene when a puzzle is finished since they are meant to be continuous.
- **Clothing:** unity clothing let us manages the ponchos of game characters separately by reacting to the physics bases movements, this allows more accurate animations and more “believable” clothing reactions.

2.2.1.2 Modelling - Blender

Blender was used to box model the characters, thanks to its easy accessibility, versatility, and updated features allowing to create models and still keep the professional standards.

2.2.2 Technical Challenges

Jumping animation: there are a few animations in the game. But this one resulted not realistic enough especially when keeping the extreme mobility of platformers at the same time. The jumping animation initial was playing in delayed and ended while the boy was still up in the air.

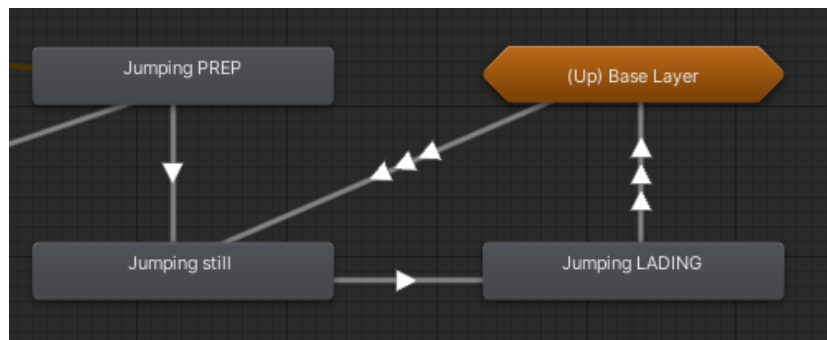


Figure 58: The boy, limbs colliders.

To solve this the animation was split into three parts: jumping prep, falling, and landing. Each is triggered separately; the prep is activated only if player is on the floor and jumps. The falling comes after the prep but can be also triggered if the player if falling from a platform. And landing will be triggered on contract with any floors.

Clothing implementation: because of its shape the ponchos were impossible to animate with the base skeleton since they were not tight enough. So, the only solution was to animate the naked body before and then apply the poncho after as a physics material that reacts with any movement. In addition to that, the body mesh will need a secondary collider on each part of the limbs that affect the poncho when it gets hit.

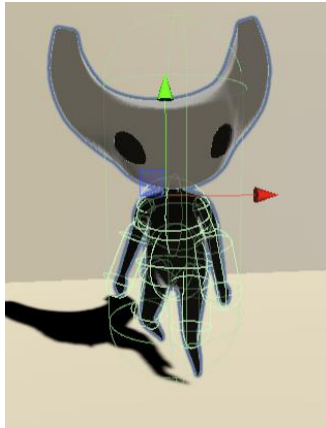


Figure 59: The boy, limbs colliders.

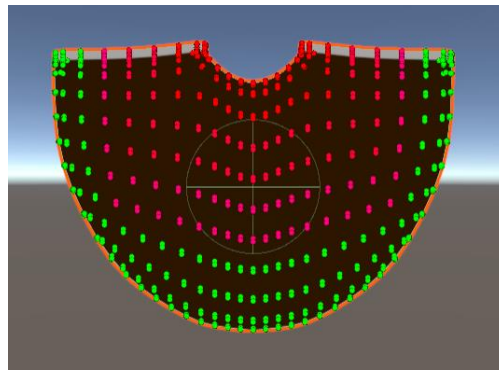


Figure 60: Poncho cloth constrains.

Large scale project: the prototype has a large scale that has to meet the deadline. Fortunately, the project can be optimised in certain parts.

For example, I can save time in the character models since they do not need much detail due to the camera being far. Same thing for their bodies, I can reuse the body structure because they are covered by the ponchos. Another was in the visual style itself, by using a cartoony style I was capable to create an environment that is fitting with the theme but also does not need extra details.

2.2.3 Design Challenges

Balance fun and storytelling: one of the major fundamental challenges when it comes to mechanical story telling in games is to design core mechanics that both make the game fun to play.

One way to approach this is a compromise between the two, for example in this case I was able to take platformer genre and add to that mechanics that will not compromise the core gameplay as for example puzzle pieces having that extra characteristic element of defamiliarization to serve the game narrative.

Diegetic calibration: another major barrier with this type of design is to keep the diegetic approach as much as possible without damaging the experience. As in another type of situation such as in console games the game would have the benefit of a limited input set such as joypad. The player would just need to try each button until something happened.

Therefore, the game needs at least the minimum instructions to avoid the player to feel lost. Although other solutions could be still considerable as for example keeping the instruction being part of the game world as 3D models.



Figure 61: In-world UI instructiuon.

2.3 EVALUATION

The evaluation will be taking place to discover story interpretation and emotion elicited allowing us to understand the emotional intensity and if player is able to piece together the events. Then it will be examined if puzzles follow the applied principles. In addition to that, this can help to spot most of usability issues and bugs thanks to the gameplays and participants different approaches allowing to polish the overall experience.

The data type recorded and examined will be audio clips and video footage of the participant upper body so I can identify their honest reactions at the exact moment they approach a new mechanic or the experience a part of the story. Any additional notes will be transcribed in text form.

The evaluation aims to improve the player understanding of the basic story line to confirm what parts stand out and what need further highlighting. To increase the emotional impact of specific scenes and mechanics to confirm that has the intended effect to the player. And lastly improving the user experience by solving any side issue that could affect the overall engagement.

2.3.1 Evaluation Methodology

The process was based on Tracy Fullerton evaluative methodology (2014):

Introduction: (5 minutes)

Welcoming the participant and present the evaluation process. Clarify any doubts and making sure they know what data will be recorded.

Gameplay session (20-30 minutes)

The participant will be asked to play the prototype from start to finish.

During the process, they will be required to think aloud exposing any reflections on the spot such as a particular decision or a reaction. The duration may vary based on the participant and experience with similar games. If participant gets stuck on some part for an excessive amount of time, a hint will be given.

The observation will be focused on:

Puzzle feedback: ensuring that the player understands the puzzle and knows what to do for completion.

Usability issues: checking if the player has any issues related to controls or interactions.

Bugs detection: checking if participant encounter any bugs.

Mechanics as metaphor reactions: paying attention to any first reaction of the participant when they encounter a new mechanic.

Interview (15 minutes)

After the playtest, the player will be invited to elaborate their thoughts using some questions. In this part I will understand the balance between storytelling and the gameplay.

The following is the questionnaire asked to the participants after the gameplay:

- Did understand the story? What was the story for you? (Story interpretation)
- How did you find the puzzles?
- What did you like?
- What didn't you like?
- What this part meant to you?
 - Holding Hands

Then I processed the words to check their frequency.

Category	Code
Understand	13
Visual	9
Girl	8
Controls	8
Mouse	6
Instructions	5
Mechanics	5
Ball	5
Puzzle	4
Intended	4
Stuck	4
Sad	4
Story	4
Missing	4
Movements	4
Spooky	3
Bug	3
End	3
Style	3
Moves	2
Press Pad	2
Solved	2
Tense	2
Familiarize	2
Expected	2
Endless Ladder	2
Fragments	2
Clouds	2
Summon	1
Angelic	1
Teleport	1
Easter Egg	1
Happy	1
Unconventional	1
Secret	1
Cues	1
Self-explanatory	1
Interaction	1
Explanatory	1

Table 2: Coding, word frequency.

Then I grouped the codes using taxonomy to check their frequency within the categories.

Category	Code	#
Storytelling	Girl	8
	Ball	5
	Story	4
	Missing	4
	End	3
	Expected	2
	Endless Ladder	2
	Summon	1
	Teleport	1
	Secret	1
Emotional influence	Easter Egg	1
	Visual	9
	Sad	4
	Missing	4
	Style	3
	Spooky	3
	Clouds	2
	Angelic	1
	Happy	1
	Tense	2
Gameplay	Expected	2
	Understand	13
	Controls	8
	Mouse	6
	Mechanics	5
	Ball	5
	Puzzle	4
	Intended	4
	Stuck	4
	Movements	4
Moves	2	
Press Pad	2	
Solved	2	
Familiarize	2	
Endless Ladder	2	

	Fragments	2
	Teleport	1
	Unconventional	1
	Cues	1
	Self-explanatory	1
	Interaction	1
	Explanatory	1
Usability and Bugs	Controls	8
	Mouse	6
	Instructions	5
	Stuck	4
	Movements	4
	Familiarize	2
	Bug	3
	Cues	1

Table 3: Coding, word taxonomy.

Since participants all comes from very similar backgrounds, which can be summarised as adult male gamer, to help further categorization I produced a spectrum based on participant interests of the game, placing them depending on what elements they emphasize more in their interviews.

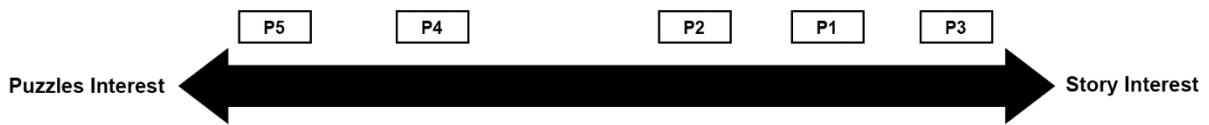


Figure 63: Coding participants spectrum.

The first thing the participant noticed was the visual style, all of them found it coherent with the story and fitting within the theme of the game. They all reacted and commented to the change of environments.

Puzzles managed to communicate the objective and how they work, none of the participants felt as they could never solve any puzzles. They do not result boring nor repetitive although there is some learning curve spikes at the start and at the last two puzzles when orb is introduced. Most of the participants got lost right at the start of the game not only because they needed to learn new mechanics but also due to lack of instructions for the controls, this occurs again on puzzle 8 when they meet the orb that requires the player to point and click the mouse. Although there is an exception with the platforming movements controls which were found with no instructions. The basic story line was understood in most of the cases with some slight variations where the girl is interpreted as less humanized being and more of a in game mechanics with no emotions. Some bugs were found, but most of the severe cases which prevent the participants to experience the whole game were fixed. With that said, there are still some minor bugs but nothing that pulls the participants out of the experience.

2.3.3 Personal reflections

Participants interpreted the story differently. This is expected since the interpretation may variate depending on their expectations. Not all elements will be fully understood, just as in poetry, there will be a margin left on the interpretation.

But this at times may also be arguably beneficial as imagination comes to fill the empty spaces. A possible solution to this would be inserting additional details to the game world for the player to be discovered. This is often called “lore” and it can be achieved with the use of embedded narrative as a method to highlight the fabula. This was particularly powerful in cases of Bioshock (2K 2007) and Dark Souls (FromSoftware 2011) which are still well respected by the gaming community with a high user score in Metacritic.

Some participants did not understand the controls. To help this, when a new type of interaction is introduced, a heads-up will be projected on screen preventing the player to get lost finding the

controls. This resulted to sacrifice a part of the diegetic approach to ensure experience will not get ruined.

Some participants did not immediately understand some parts of puzzle 8 and 9. This is caused by the two puzzles being larger than the previous ones as in fact, player must throw the orb in blind spots sometimes and the girl will move towards the interactable element which is out from the player's vision. This could be solved by have the camera follow the girl when she gets teleported out of player's view.

3 CONCLUSION

In conclusion, the final product shows a degree of effectiveness of how mechanical storytelling can improve on the emotional experience. Since games have already this intrinsic quality of being interactive which separates this media among the others, games with a strong story could acquire further immersion by relying on combinations of narrative and interactions.

On that note, there is to say that to incorporate such a feature, context must be taken in consideration too and using framing devices can help direct better the wanted message. The context has a strong impact on player's interpretation and provides the designers with flexibility in terms of the emotion they want to convey.

By unifying those surrounding elements towards a specific feeling, it is more likely convey the intended emotion. Although the final interpretation will be up to the player and this is affected by uncontrollable variables such as their previous experience and game preferences. Interpretation in some cases can be very powerful allowing the players to fill those empty spots with their imagination, for example in horror games.

Puzzle games require the player to think. This unfortunately steals player's attention sometimes which can cause conflict with the most of passive narration elements, risking the player to ignore them. So, when it comes to place mechanics as metaphor, designers need to be careful on the pacing. Also, mechanics can indeed tell stories but there are compromises that need to be made in order to keep a game still fun to play. Therefore, games such as *Journey* are relatively easy to complete.

With that said, blending mechanics with narrative and using the right supporting "packaging" can improve the immersion creating what Ueda refers to empathy. "When you compare games to those other media, what they do better... is to build empathy. There is a more realist feeling of presence. They build atmosphere... I think game can rival other media, to tackle any obstacles to building that empathy" Fumito Ueda (2016). And thanks to that empathy designers can share better their stories reaching new levels of storytelling.

For future iterations of the project recommendations are to humanize more the characters with small animations and adding more detail on the game world giving extra details for the players to explore that can give some background information.

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Thekla, Inc., 2016. *The Witness*. Microsoft Windows 4. Thekla, Inc.

5 APPENDICES

5.1 APPENDIX 1: ETHICS CHECKLIST



Research Ethics Checklist

About Your Checklist	
Ethics ID	34863
Date Created	01/12/2020 16:41:19
Status	Submitted
Date Submitted	02/12/2020 01:07:20
Risk	Low

Researcher Details	
Name	Nino Frazzitta
Faculty	Faculty of Science & Technology
Status	Undergraduate (BA, BSc)
Course	BSc (Hons) Games Design
Have you received funding to support this research project?	

Project Details	
Title	Creation of a 3D immersive game that uses mechanical storytelling to convey an emotional experience.
Start Date of Project	20/10/2020
End Date of Project	14/05/2021
Proposed Start Date of Data Collection	21/03/2021
Supervisor	Charlie Hargood

Summary - no more than 500 words (including detail on background methodology, sample, outcomes, etc.)

The project aim is to design and implement a 3D game capable of eliciting different emotions to the user. To do that it will be used a range of techniques revolving around game mechanics as a conveyer to deliver to communicate this emotional experience. To do that we are going to base the game on interactions to establish a deep emotional connection between the player and game.

After the design stage, a prototype will be created and evaluated remotely using the following techniques:

- User studies (35 minutes): assessing the effectiveness of those mechanics and their impact on player emotions. We are going to gather qualitative data with a 2 phases structured user study.
- Gameplay session (20 minutes): the subject will be asked to play the prototype; this will be screen captured and the subject will also be video recorded
- Interview (15 minutes): the subject will undertake an interview where will answer on question based on the gameplay previously happened. The question is based on their interpretation of those mechanics and what emotion was emphasized.

Ethical Issues - Low risk: since this study consists of playing a game and answer a few questions. We might consider the factor of eliciting emotions to the player as sometimes they will tend to feel empowered or disempowered, although the chance of encounter any risks are still too small to be considered.

Filter Question: Does your study involve Human Participants?

Participants	
Describe the number of participants and specify any inclusion/exclusion criteria to be used	
<p>The number of subjects are 15, all of them will be over 18. They will tend to be gamers which means they have already some experience on playing games.</p> <p>Their ethnicity will be mixed.</p>	
Do your participants include minors (under 16)?	No
Are your participants considered adults who are competent to give consent but considered vulnerable?	No

Is a Disclosure and Barring Service (DBS) check required for the research activity?	No
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Recruitment	
Please provide details on intended recruitment methods, include copies of any advertisements.	
The recruitment will be take place online over a range of social media such as Instagram and Facebook.	
Do you need a Gatekeeper to access your participants?	No

Data Collection Activity	
Will the research involve questionnaire/online survey? If yes, don't forget to attach a copy of the questionnaire/survey or sample of questions.	No
Will the research involve interviews? If Yes, don't forget to attach a copy of the interview questions or sample of questions	Yes
Please provide details e.g. where will the interviews take place. Will you be conducting the interviews or someone else?	
The interview will take place remotely on a video call trough a communication program such as Discord and Zoom.	
Will the research involve a focus group? If yes, don't forget to attach a copy of the focus group questions or sample of questions.	No
Will the research involve the collection of audio materials?	Yes
Will your research involve the collection of photographic materials?	No
Will your research involve the collection of video materials/film?	Yes
Will any photographs, video recordings or film identify an individual?	Yes
Please provide details	
The participants will be recorded to capture reactions such as body language and facial expressions.	

Will any audio recordings (or non-anonymised transcript), photographs, video recordings or film be used in any outputs or otherwise made publicly available?	No
Will the study involve discussions of sensitive topics (e.g. sexual activity, drug use, criminal activity)?	No
Will any drugs, placebos or other substances (e.g. food substances, vitamins) be administered to the participants?	No
Will the study involve invasive, intrusive or potential harmful procedures of any kind?	No
Could your research induce psychological stress or anxiety, cause harm or have negative consequences for the participants or researchers (beyond the risks encountered in normal life)?	No
Will your research involve prolonged or repetitive testing?	No

Consent

Describe the process that you will be using to obtain valid consent for participation in the research activities. If consent is not to be obtained explain why.

The participant will be asked to read and sign a online form. In this form are all information about the data that will be recorded and how it will be used.

Do your participants include adults who lack/may lack capacity to give consent (at any point in the study)?

No

Will it be necessary for participants to take part in your study without their knowledge and consent?

No

Participant Withdrawal

At what point and how will it be possible for participants to exercise their rights to withdraw from the study?

At any point of the user study.

If a participant withdraws from the study, what will be done with their data?

The data will be destroyed.

Participant Compensation

Will participants receive financial compensation (or course credits) for their participation?

No

Will financial or other inducements (other than reasonable expenses) be offered to participants?

No

Research Data

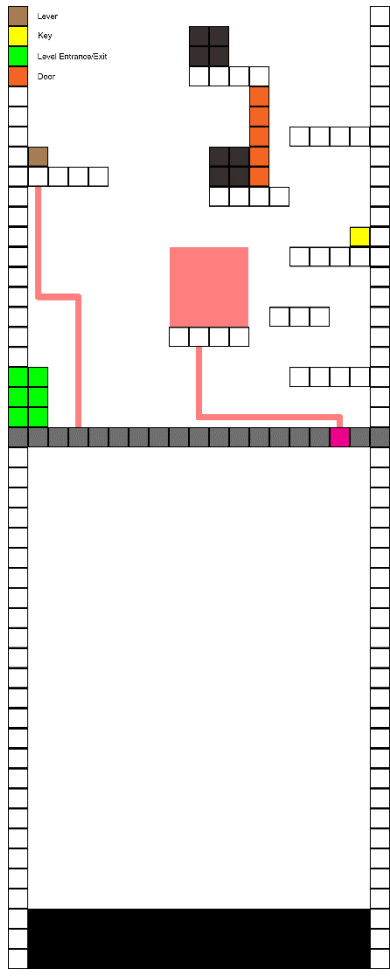
Will identifiable personal information be collected, i.e. at an individualised level in a form that identifies or could enable identification of the participant?

Yes

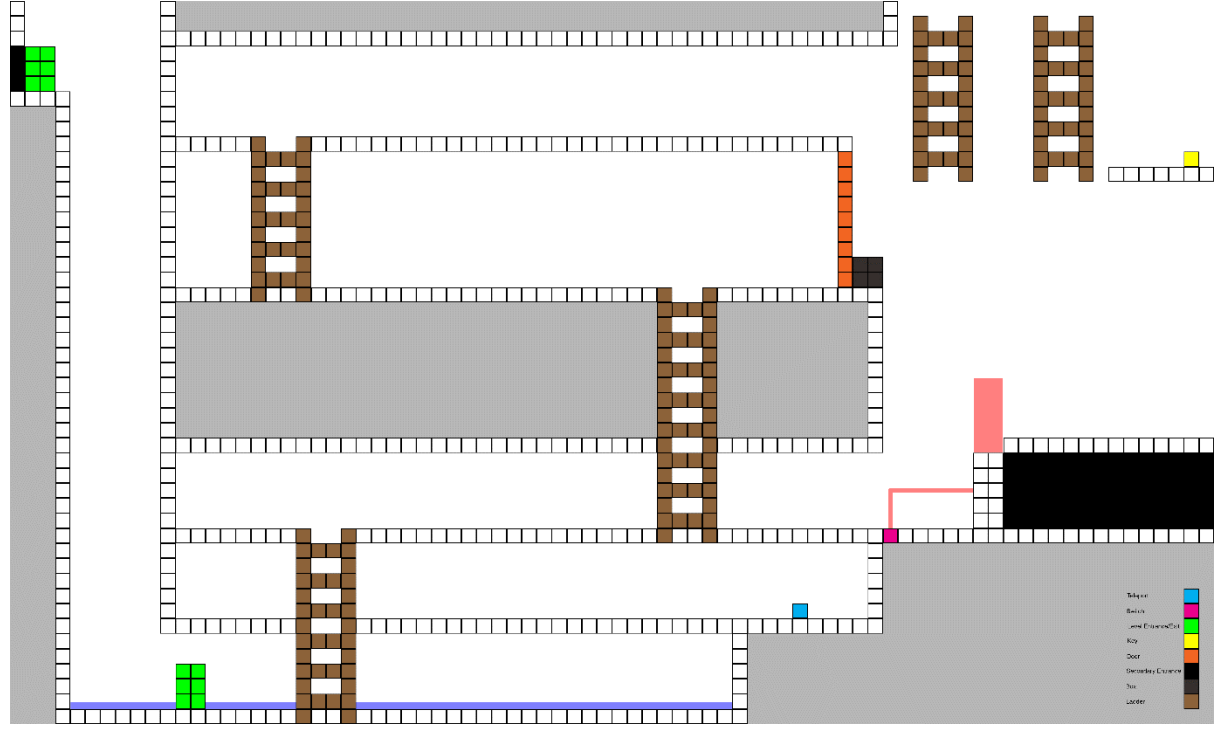
Please give details of the types of information to be collected, e.g. personal characteristics, education, work role, opinions or experiences	
Their voice and face will be video recorded to gather any real-time of human reaction to the game.	
Will the personal data collected include any special category data, or any information about actual or alleged criminal activity or criminal convictions which are not already in the public domain?	No
Will the information be anonymised/de-identified at any stage during the study?	Yes
Will research outputs include any identifiable personal information i.e. data at an individualised level in a form which identifies or could enable identification of the individual?	No

Storage, Access and Disposal of Research Data	
During the study, what data relating to the participants will be stored and where?	A video recording the face and screen capture of the gameplay will be recorded. All the data will be stored in a BU cloud drive.
How long will the data relating to participants be stored?	The data will be stored for 1 month after the recording.
During the study, who will have access to the data relating to participants?	There will be only one member accessing the data, Antonino Frazzitta.
After the study has finished, what data relating to participants will be stored and where? Please indicate whether data will be retained in identifiable form.	After the study the data will be transferred into a digital report and will be integrated into the dissertation.
After the study has finished, how long will data relating to participants be stored?	All the data regarding the study will be destroyed at the moment the dissertation is submitted.
After the study has finished, who will have access to the data relating to participants?	Nobody will be able to access the data.
Will any identifiable participant data be transferred outside of the European Economic Area (EEA)?	No
How and when will the data relating to participants be deleted/destroyed?	The data will be deleted from the BU drive. This will happen in the same day the report is finalized.
Once your project completes, will any anonymised research data be stored on BU's Online Research Data Repository "BORDaR"?	No
Please explain why you do not intend to deposit your research data on BORDaR? E.g. do you intend to deposit your research data in another data repository (discipline or funder specific)? If so, please provide details.	

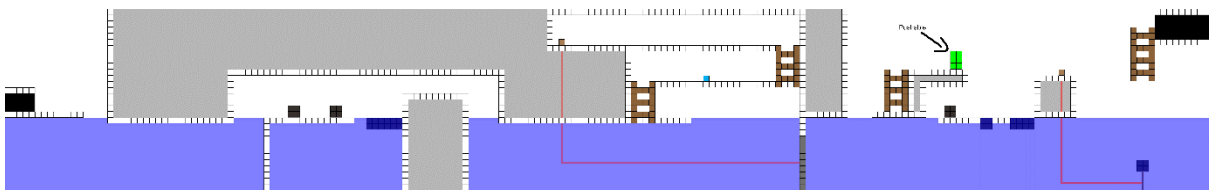
5.2.4 Puzzle 4



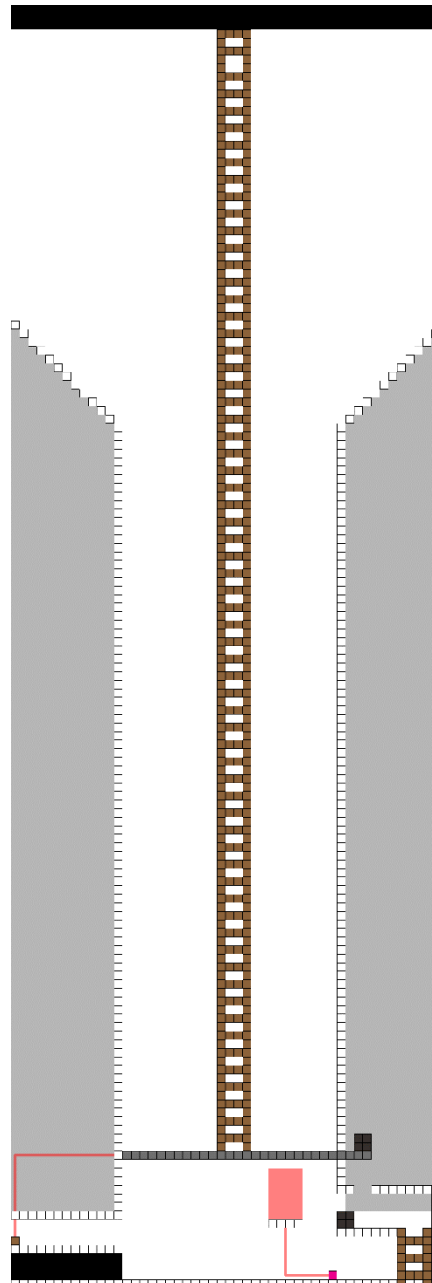
5.2.5 Puzzle 5



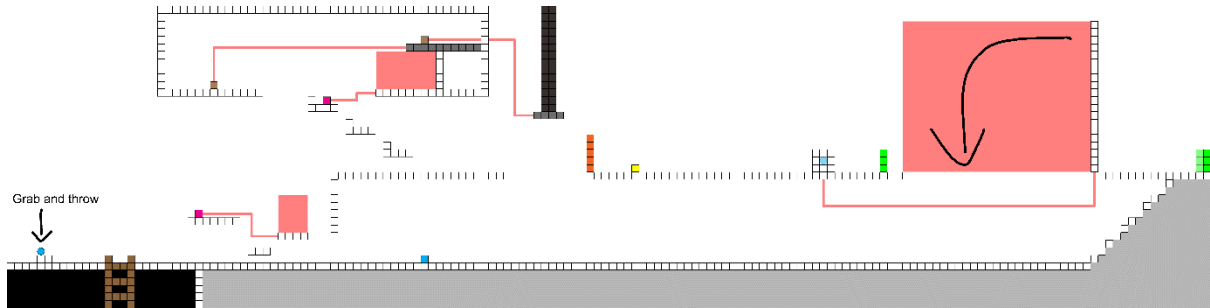
5.2.6 Puzzle 6



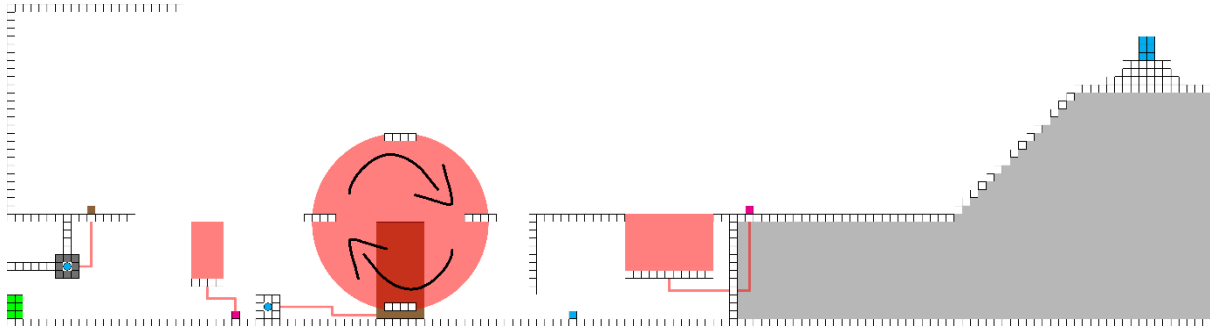
5.2.7 Puzzle 7



5.2.8 Puzzle 8



5.2.9 Puzzle 9



5.3 APPENDIX 3: THIRD PARTY ASSETS

5.3.1 Tools

<https://assetstore.unity.com/packages/tools/animation/fast-ik-139972>

<https://assetstore.unity.com/packages/tools/utilities/b-zier-path-creator-136082>

<https://assetstore.unity.com/packages/tools/particles-effects/bfw-simple-dynamic-clouds-85665>

5.3.2 3D

<https://sketchfab.com/3d-models/doggy-crystals-4332f4c510844a569e68819c0a4884b9>

<https://sketchfab.com/3d-models/glowing-crystals-cb97c1da9c284f77b1fd0842bd0b26ed>

<https://sketchfab.com/3d-models/stylized-well-d27868fe8e324434a3fd5ee3429372e1>

<https://assetstore.unity.com/packages/3d/environments/fantasy/translucent-crystals-106274>

<https://assetstore.unity.com/packages/3d/vegetation/trees/stylized-nature-bundle-135352>

<https://assetstore.unity.com/packages/3d/environments/dungeons/snaps-prototype-dungeon-155230>

<https://assetstore.unity.com/packages/3d/props/modular-wooden-set-80477>

<https://assetstore.unity.com/packages/3d/props/rock-collection-semirealistic-108994>

<https://assetstore.unity.com/packages/3d/props/runic-stones-26988>

<https://assetstore.unity.com/packages/3d/mystic-runestone-82041>

<https://assetstore.unity.com/packages/2d/textures-materials/sky/allsky-free-10-sky-skybox-set-146014>

5.3.3 VFX

<https://assetstore.unity.com/packages/vfx/shaders/toony-colors-free-3926>

<https://assetstore.unity.com/packages/vfx/shaders/volumetric-clouds-25527>

<https://assetstore.unity.com/packages/vfx/particles/cartoon-fx-free-109565>

<https://roystan.net/articles/toon-water.html>

5.3.4 Sounds

<https://www.zapsplat.com/music/dungeon-ambience-cold-dark-and-erie-droning-tone-could-also-be-cave/>

<https://www.zapsplat.com/music/cave-ambience-stream-flow-trickle-echoey/>

<https://www.zapsplat.com/music/loop-unsteady-engine-sound-of-a-small-tank-damaged-2/>

<https://www.zapsplat.com/music/fantasy-game-spell-01/>

<https://www.zapsplat.com/music/glass-bottle-break-smash-long-messy-bright/>

<https://www.zapsplat.com/music/big-junk-impact-smash-crash-mostly-metal-plastic-glass-and-wood-version-2/>

<https://freesound.org/people/zippi1/sounds/18264/>

<https://freesound.org/people/Dr.%20Macak/sounds/544889/>

<https://freesound.org/people/haniebal/sounds/423314/>

<https://freesound.org/people/P%C3%B3l/sounds/385938/>

<https://freesound.org/people/nsstudios/sounds/479192/>

<https://freesound.org/people/fredzed/sounds/416385/>

<https://freesound.org/people/InspectorJ/sounds/429104/>

<https://freesound.org/people/GaryQ/sounds/135435/>

https://freesound.org/people/foochie_foochie/sounds/331047/

<https://freesound.org/people/NeoSpica/sounds/512243/>

<https://freesound.org/people/SieuAmThanh/sounds/530812/>

<https://freesound.org/people/qubodup/sounds/212143/>

<https://freesound.org/people/lwdickens/sounds/269003/>

<https://freesound.org/people/oscillator/sounds/65144/>

<https://freesound.org/people/spanrucker/sounds/272242/>

<https://freesound.org/people/Bertsz/sounds/500910/>