Creation and composition of different narrative and graphic components of a video game

Aythami Godoy Rodríguez

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Supervised by: Miguel Chover Selles.

To my dear friends Elifaz, Bildad and Sofar

Acknowledgments

First of all, it is necessary to thank the Final Degree Project supervisor, Miguel Chover, for his attention in solving all doubts about the nature of the project. Secondly, Àlex Beltran should be thanked for allowing the use of some of the scripts that have been used to show certain functions. Finally, a special mention must be made of the Jaume I University Library, where it has been possible to consult some quite useful books during the development of this work.

Of course, thanks to Sergio Barrachina Mir and José Vte. Martí Avilés for making a bachelor's thesis structure available to their students.

Abstract

This document is the report of the project presented for the bachelor's thesis, which has been written in order to record the development process of all the parts that make up the final result, as well as to present the information that can be extracted through it. The project, as will be revealed during its reading, is focused on the creation of graphic assets (models, animations, etc.), the drafting of a valid narrative framework for a video game, the elaboration of complex scenarios in the game engine (and the resolution of all the problems involved) and the subsequent assembly of all these elements through key scripts. There will also be a small section dedicated to sound, which corresponds to the last of the groups of assets into which the document is divided.

Contents

Chapter 1
Introduction

Contents

1.1 Work Motivation

The motivation of the work was, for the most part, wanting to demonstrate what process should be followed when you want to make a series of assets for a video game. Within this process, an attempt has also been made to discuss how to bring all of these assets together in a narrative environment where it can be given a broader context. As a result of these concerns, this project emerged.

1.2 Objectives

This project has five main objectives:

1. To present the design, modeling and animation process for structures of different shapes.
2. To show the relationship between literary archetypes and video games through the structuring of a story (with its respective storyboard).
3. To build different scenarios on which to explain how to solve some of the specific problems they present depending on their structure.
4. To program basic scripts that allow displaying graphic resources.
5. To manage the extra-diegetic music of a scene.

1.3. Environment and Initial State

The project had a single person, dedicated to all the project design, programming and management tasks (as reflected in the following section). All the work has been carried out within a period of five months (of which around four months have been allocated for the project, leaving the last one for the constitution of documents, presentations, etc.).

Chapter 2
Planning and resources evaluation

Contents

2.1 Planning

The initial planning was divided according to three main groups: ***programming***, ***art*** (graphic, sound and conceptual) and tasks related to the correct ***presentation*** of the work.

TASKS	HOURS
Particle programming	**20 hours**
Implementation of movement and interaction scripts	**10 hours**
Configuration of interactive elements	**30 hours**
Programming and configuration of different materials and their shaders, and application to their respective models	**20 hours**
Programming changes between scenes	**5 hours**
Programming of the audio inside the game	**5 hours**
Creation of animator controllers	**10 hours**
Modelling of the different characters	**40 hours**
Animation of the characters	**20 hours**
Modelling and assemblage of environments	**50 hours**
Elaboration of the different stories and their respective *storyboard*.	**20 hours**
Soundtrack composition	**20 hours**
Production of the audio tracks	**10 hours**
Testing labors	**20 hours**
Creation of the final memory and presentation	**20 hours**
TOTAL:	**300 hours**

2.2 Resource evaluation

Initially, several different resources have been used. First of all, the engine that has been used during the development of the project has been *Unity 2019.26f1*. Within this, all the scenarios have been built and some of the elements have been programmed. Secondly, some scripts that have been used for some characters are owned by Àlex Beltran Belles. The tool that has been used for the longest time has been *Blender 2.82*. With Blender everything has been modeled and animated: objects, characters, etc.

In the sound section, initially there was an equipment consisting in a recorder, a guitar, a synthesizer, an equalizer and a keyboard. In addition to the Audacity audio editing program.

And finally, for the narrative part, the work of Vladimir Propp [1] and some chapters of a text by Gabriel García Márquez [2] have been consulted.

Vladimir Propp (1895-1970) was an important Russian folklorist, pioneer in the study of popular stories (that is, those children's stories intended for the learning of ethical values). For years he devoted himself to extracting the basic features that make up popular stories, both in the use of characters and in the representation of situations. Thus, in 1928 he would publish his most remembered work, *Morphology of the folktale*, an essay where he presents the 31 functions that constitute the traditional european story. For Propp, a function is an element that at a structural level is repeated in many stories and that is the easy way for the argument to advance. The information contained in the work of this author has been exposed in a practical way in this project.

On the other hand, Gabriel García Márquez (1927-2014) was a colombian author, one of the greatest exponents of 20th century hispanic literature. He is often remembered for his work as a novelist, completely forgetting that for many years he worked writing stories for television. The summary of Gabriel García Márquez's creative process is described in *How to Tell a Story*, published in 1995. This is a content that has been very useful, especially when creating the script for this work.

Chapter 3
Game Design

Contents

3.1 Introduction

Next, it is intended to show all the design facets (in which the artistic and programming tasks are involved, both mentioned in the previous section). The first part to be treated will be the narrative so that the reader can contextualize the following sections.

3.2 Narrative design

The idea was to collect three stories with different characters, which would allow, on the one hand, to create scenarios with different elements and, on the other, to unleash the technical specifications of the different designs.

3.2.1 Eva's story

In this story, the main character is Eva, a girl who lives at the entrance of a forest with her alpaca, which one day runs away, getting lost. Worried, Eva decides to enter into the forest to find her pet. Inside the forest, she discovers that a gang of frogs have kidnapped her alpaca to steal its wool. Given the inability to face so many enemies, she decides to infiltrate and take her alpaca with the help of a magic flute a dwarf gave her. Finally, Eva and her alpaca return home without problems. This tale, which is designed for an adventure video game, has a series of literary elements to highlight.

First of all, that story was made to show a possible application of the work of Vladimir Propp into the field of video games. So, if you put into practice some of the 31 functions that define folk tales according to this autor, the story can be divided into the following sequence of actions:

Absence → A loved one of the main character disappears.	Eva loses her Alpaca.
Interdiction → The protagonist have a prohibition.	Eva should not enter under normal conditions inside the forest.
Violation of interdiction.	Eva goes into the forest.

Villainy and lack → The villain causes harm to the loved one.	Frogs kidnap the alpaca.
Departure → The hero goes away from home. Meeting with the donor.	Eva follows the path through the forest and meets a dwarf who needs help.
First function of the donor → The donor receives some form of help from the hero.	Our protagonist helps the dwarf, who is stuck in spider webs.
The hero receives a magical helper item.	The dwarf gives Eva a magic flute with which to drive away her enemies.
The hero and the villain face-off.	In this case, more than a physical confrontation, what Eva does is enter the frogs' den.
Victory → The villain is defeated.	Eva manages to retrieve her pet, so she defeats the frogs.
Return → The hero returns with his family.	The couple returns home.

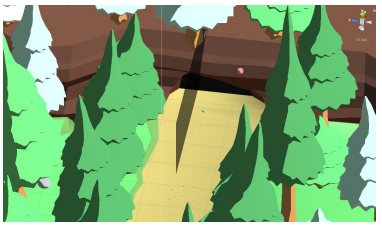
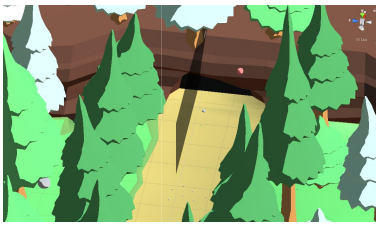
3.2.2 Violeta and Abedul against the evil dragon.

This second story that was written is developed around two cats named Violeta and Abedul. They have been sent to a mine owned by dwarves (the village of Dindøl), which has been taken by Tannløs, a huge dragon who has driven the dwarves away from their homes. The two cats will end up entering the mine and defeating the evil beast, thus saving everyone.

In this tale, the center of the action are not the events (that aspect is relegated to the previous story), but on how to present them in an audiovisual format. That is why a complete storyboard of this tale was made. The main objective was to leave a complete outline about the different events in order to facilitate the programming tasks of cameras, texts, etc.

In this document, only a small fragment of how the cinematics have been designed will be shown. The complete storyboard has a total of 18 pages and is available for consultation through its corresponding link in the annex. The scenes shown are those corresponding to the beginning of this story.

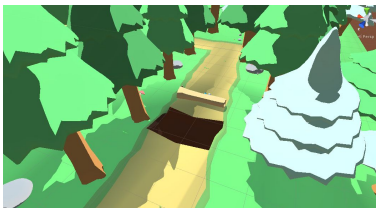
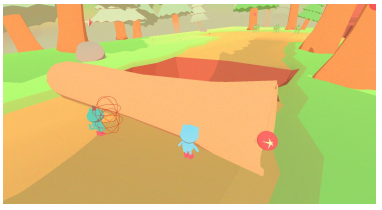
SCENE 1

CHARACTER	**DIALOGUE**	**PLANE**
Abedul	-How much is left? We could rest...	 *(It's getting closer. Duration:2 sec.)*
Violeta	- Don't complain, there is nothing left!	 *(It's getting closer. Duration:2 sec.)*
Violeta	- If we don't slow down we will arrive soon! One night more and we would already be in the Dindøl mines.	 *(Violeta appears. More or less where she is now, she turns in the direction of the cave and says her sentence. After the player clicks to continue, she turns in the direction of the mountain and leaves the frame).*
Abedul	-Uf ... we have been like this for 3 days in a row ... Hey, not so fast!	 *(Same procedure with Abedul).*

-	-	 *(The camera turns around Abedul and joins him as if it were the game camera. When he reaches the position where Violeta is, the camera stops and focuses on the mountain).*
-Violeta	-Dindøl mines! You see? Nothing remains!	
-Abedul	-Wow! The engravings they showed us when we were young!	
-	*(A scream is heard, as if someone asked for help)*	 *(Cats startle)*
-Violeta:	-What was that? Let's go see!	

END OF SCENE

SCENE 2

CHARACTER	DIALOGUE	PLANE
-Abedul:	-Hey, Is that a hole there?	 *(Si uno de los dos gatos no está cerca de este sitio, en cuanto llegue uno que el otro se acerque)*
-Abedul:	-It's too big! I don't think I can pass ...	 *(It zooms out a bit, like the close-up of the first scene, but backward).*
-Violeta:	¡Don't be silly, Abedul! With the strength you have, you can push it with [BUTTON]!	

END OF SCENE

On the other hand, this story has also worked in order to make non-linear dialogues (where the player can dialogue with the NPCs without having to follow a specific order).

Finally, it is interesting to note that in the field of anthroponymy, most of the characters in this story who belong to a certain ethnic group have a defined theme in their names. For example, all dwarfs have names derived from metamorphic rocks (alluding to their living in a mine). Another example is human soldiers, whose proper name derives from weapons of the Roman Empire.

3.2.3 Twii and the eldegram seed

In this tale, Twii is introduced. Twii is a finger-sized character in charge of collecting seeds. One day a bird takes an eldegram seed (which belongs to a plant highly appreciated by Twii) and this character decides to look for it in an apartment building where the bird resides.

This story is designed so that it is not very complex to understand: it only requires finding a way to go up the building (Corresponding to scene four of the Unity project) until reaching the top, where the seed has fallen. Actually, what is important in this story is not the events narrated, but rather the actions that the character carries out, which allows a character to be shown whose set of animations is wide and detailed, in turn requiring the supply of technical specifications in its mesh. In short, it is a story that only serves to develop another area of graphic design for this project.

3.3 Mechanics and level design

3.3.1 Mechanics

For this section, the conceptual design of the mechanics has been worked on, planning the animations used for them, programming the animator controllers and applying them to the game environment. First, the different mechanics are presented below, indicating which of the four playable characters has it and listing the total number of animations required to form the animator in each case.

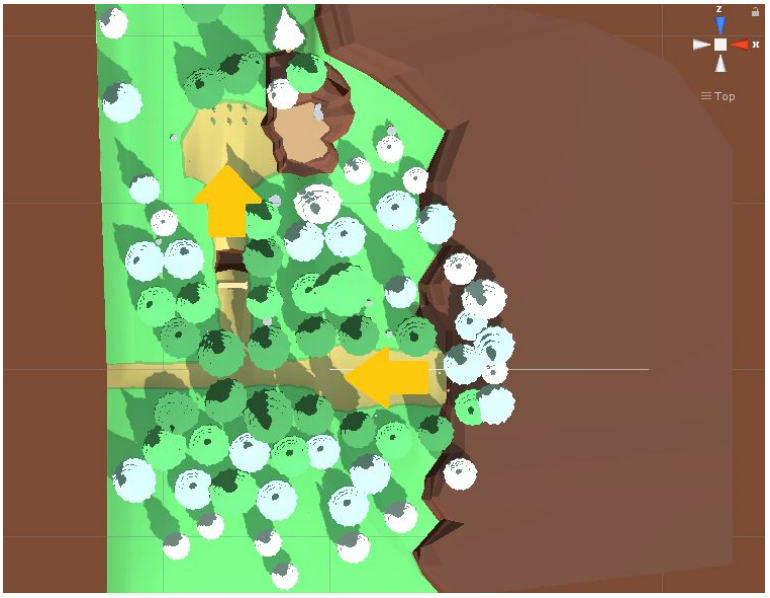
Name	**Description**	**Characters**	**Number of animations**
Move.	Displacement occurs in one direction after pressing a button.	Eva, Violeta, Abedul and Twii.	1
Jump.	The characters descend with a quick push.	Violeta, Abedul and Twii.	2
Talk.	Open a character's text box.	Violeta and Abedul.	1
Hit.	Harm an enemy.	Violeta and Abedul.	2
Press buttons.	This mechanic activates platforms.	Violeta and Abedul.	0
Push objects.	Drag some objects from their place.	Abedul.	2
Swing on a rope.	Sway in all directions. The size of the rope can be varied to adjust better the fall.	Twii.	3
Climb.	Stick to and move around an area on the wall.	Twii.	3

The animator controllers will be explained in more detail in the section corresponding to graphic design.

3.3.2 Level design

Four scenarios have been modeled and structured, of which only three are presented as levels (the rest are a set made to demonstrate how to deal with interior models). These levels correspond to the settings of the story of Violeta and Abedul and are presented as follows:

Introduction scene → The first scene serves to introduce the main mechanics of Violeta and Abedul. To do this, a completely linear structure is followed in terms of the actions to be performed, reinforced with the shape of the scenario model.



The arrows indicate the direction of the actions that allow the development of the game.

The structure leads to the first combat, with enemies somewhat weaker than those that will emerge in the future.

Transition scene → This is the scene with the most dialogues of the four proposals. It remains linear to the extent that there is only one way to facilitate progress, but this time due to the stage is open, it gives greater prominence to the exploration aspect of the player.

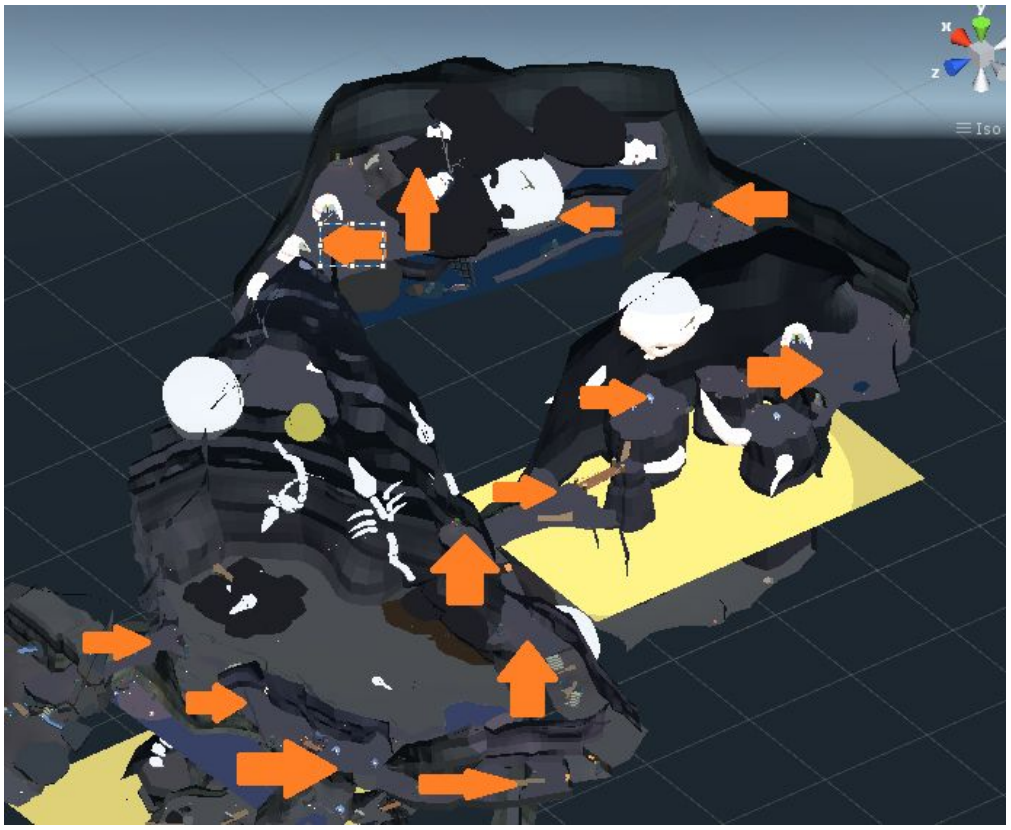
The ideal route would be to do this entire route.

The player would go to the point marked in this image and automatically start the cinematic that gives way to the next scene.

Dungeon prototype → This scenario (in the field of level design) is the most important, as it presents a dungeon with a final boss, like in conventional adventure video games. It is divided into three parts, with a different level design.

The first part corresponds to the lower area of the model. It follows a linear structure, as was the case with the first scenario shown, and presents all possible enemies (except for the final boss).

The second part has a network design: There are different routes with completely delimited spaces and, although there is an ideal route, exploration of different nodes is possible (*node* is equivalent in this case to *room*). The main route, however, is guided by the presence of enemies.



In the third part of the design of this level, the player must find three levers to access another one with which to free the area where the dragon is. The structure that follows is of the "Hub-and-spoke" type, since the player is not asked to follow an order when finding the levers and must constantly return to the main routes to continue the search.

Finally, the fourth part is the descent to the dragon's lair. There is a certain cyclical motivation, since this final section recovers the linearity of the first. In order not to make the level too long, it was decided that the final enemy's room was at the end. This responds to the need to streamline the route, taking advantage of the physics to advance faster.

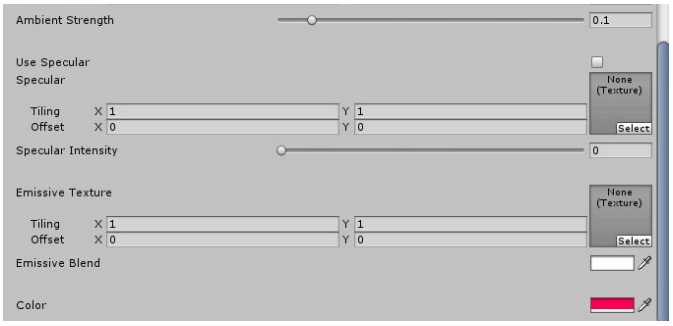
The dragon's room is prepared for possible combat: it is the largest of all, it has a limited floor and there are areas where you can temporarily take refuge.

3.4 Graphic design

3.4.1 Configuration and programming of materials, illumination and particles

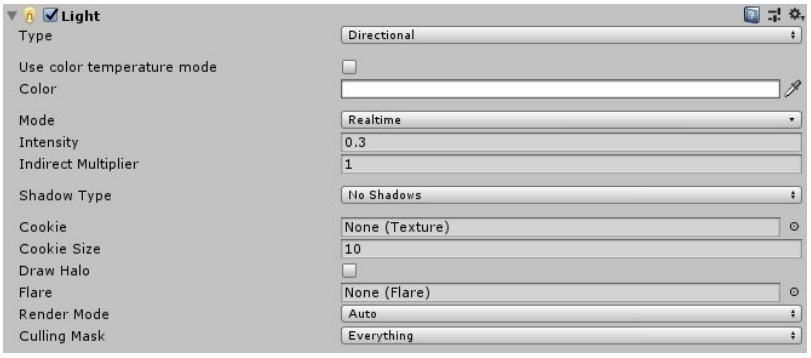
As for the materials, it should be noted that two different types have been used. The first of all deals with the programming of a *cel-shading* type shader, which tries to emulate the cartoon style of video games such as *The Legend of Zelda: the Wind Waker*. This shader is applied to the materials of objects and characters, leaving the default *Blender* material relegated to the environment.

The most important sections that had to be configured during the development of the work have been *Emissive Blend* (which is responsible for determining how the shadow of an object is affected when it is projected onto the one with this shader), *Color* (where you can touch up the color value that can be observed when applied to a material) and *Ambient Strength* (which configures some aspects related to saturation of shading).

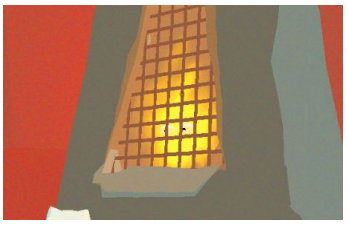


The global lighting, on the other hand, is configured through two directional lights, one in charge of visually making the shadow on the character visually beautiful (that does not cast a shadow) and another that seeks to show the projection that the object causes on the ground.

The main parameters that have been handled have been *Color* (which configures the tone emitted by the object), *Intensity* (referring to the power in which the light is displayed) and *Shadow Type* (where it has been placed in one as *No Shadow* and another as *Hard Shadows* to carry out the comments in the previous paragraph).



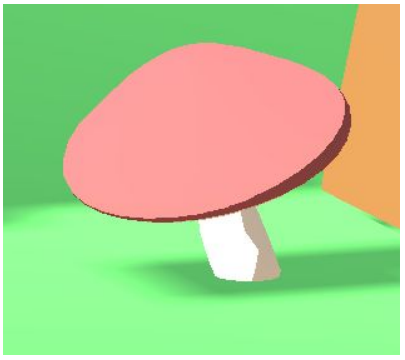
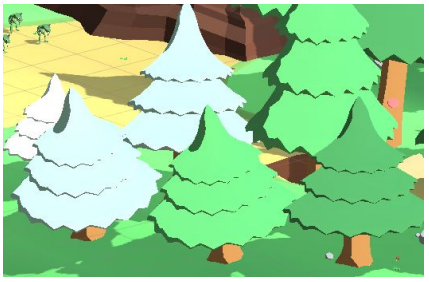
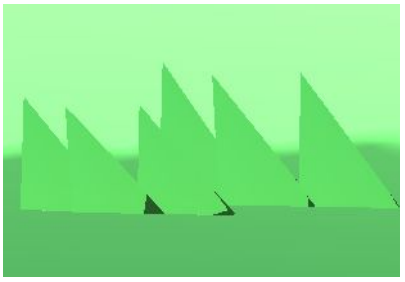
Regarding the particles, the configuration carried out has resulted in three differentiated particles, as shown in the following table:

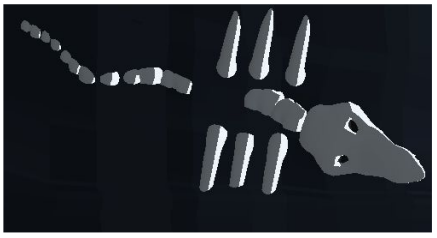
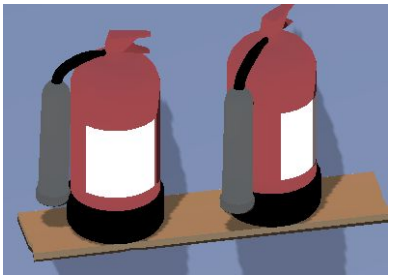
 ***Clouds***	 ***Fire***	 ***Fog***
It occupies a large dimension and its quantity is scattered around the skybox.	It is a particle system configured at a certain point, where it is emitted continuously in a loop.	It is similar to clouds, but with higher density and with the ability to disperse in case the individual approaches (and regroups when they move away).

3.4.2 Object design

This section refers to all the elements that have been designed and modeled for the project, but that are not characters, but elements of the levels. They can be divided into two main categories: those that emulate nature and those that try to represent manufactured elements. There are a total of 59 real-world objects represented on the stages, which in turn have (in some cases) variations, as in the case of stones, where there are six different types. It is also the case that an object, instead of having a variation in its mesh, what it has is a series of alternative materials. This occurs, for example, in trees, where its constant repetition arised a necessity to look for a visually correct way to be able to create distinctions between each of them. In this case, there are five different types of materials for pine leaves.

Below are some of the most widely used models:

 Mushroom.	 Mushroom.
 Mushroom.	 Mushroom.
 Four different types of trees (with a colour variation).	 Grass.

 Dwarf houses.	 Pitcher.
 Cannons.	 Streetlight.
 Bottles.	 Skulls.
 Several separately modeled bones that make up the skeleton of a dragon.	 Two fire extinguishers.

Door.

Sliding doors.

3.4.3 Character design

The development process will not be discussed in this section, it will be left for later. Now the focus of interest is on the specifications of the result obtained, both in the estimated number of polygons per model and in their characteristics for being manipulated with bones.

Violeta and Abedul

Violeta and Abedul are two characters created based on the same common structure that oscillated around 7000 faces. This number of faces is quite good considering that, as a general rule, a main character has in the PC version an estimated polycount of 12000-30000 polygons.

In addition, Violeta and Abedul require several divisions of the mesh (which implies more faces) because a good amount of extra polygons are required to make a large animation set.

The distinction that was made between the two characters had to be clear visually for the players, but at the same time relate them in some way. Thus, in addition to the morphology, Violeta and Abedul share a similar color palette in terms of layout, except that in the case of Abedul, blue color is changed to a shade closer to green and the rest of the shades are duller. This encourages Violeta to be understood as the part with the most presence in the pair, which is reinforced with her greater capacity for movement.

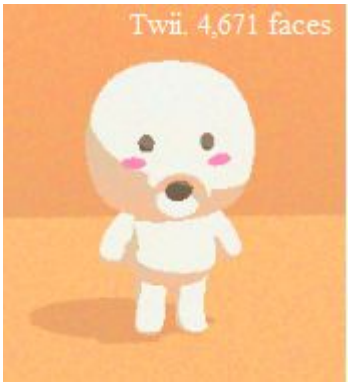
Eva

Eva, for her part, is the simplest of all main characters. Her hair modeling is interesting, because it is an element that has been made from cutting directly with the *Blender knife* function. This causes the result of the face to be irregular, giving more visual sense to the figure. Now, in terms of its volume, an extrusion has been made that through the sculpture function of the modeling tool has managed to emulate the collected hair of a girl.

Unlike the other characters, Eva has her arms inside her coat, which turns her skeleton's approach to being animated, focusing the animation's attention on the legs.

Twii

Twii is by far the most complex character in the set of character models. The reason is simple: there is a serious difficulty in reconciling the shape of the design (with a big head and a chubby little body) with the animations it requires (doing all kinds of actions that require complexity in the structure used). The way in which all the problems derived from the latter have been solved has been by doing a thorough job in the polygons that join the head with the body, the weight allocation that these faces have with the bones makes it easier to separate the head in animations where the posture is complex (for example, when Twii rises).



Rats

It is an NPC. There are three different types of rats, made with a base of around 4000 faces. One of them is shown here, as this is a good example of reusing work already done to create a new element (as mentioned earlier with stones and trees).

The rat with the most polygons is this. It is a rat with a cane, with 5195 faces (this increase is due to the fact that it has an added item and because the around of the arms has been subdivided so that it can be easily animated).

Parlatore

This character was created to fill in the fourth scene.

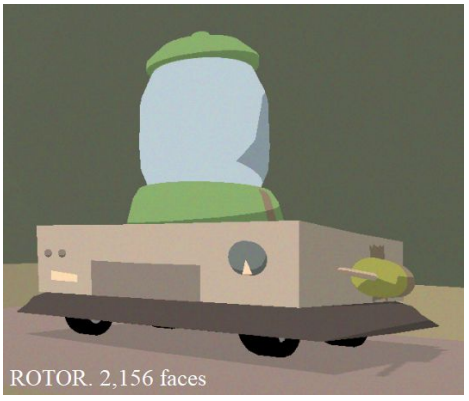
In particular, the way animation is integrated into its environment stands out. This implies that, while other characters may have a more generic idle (as is the case with playable characters, since the integration of their idle cannot be contemplated in all situations they may be in) Parlatore has one arm supported against the wall and an orientation towards where you look that already places you at a specific point in the scene.

Teterabot

Teterabot is part of a small group of characters that do not want to represent organic figures but despite this, they have movement. The important thing about this character is the animation, which requires that most of this character's bones remain static, leaving only the limbs in motion (thus distancing himself from the other animated characters that make up my work).

ROTOR

It is a character that goes beyond what was discussed with the previous character. Furthermore, the fact that it comes from the small group of non-anthropomorphic models has been added. His interest lies in seeing the different parts that make up the character, since it is a composition of different designs that, together, form a recognizable figure (similar to some of Giuseppe Arcimboldo's paintings, but much more simplified).



Corneano

This character, like almost all the dwarfs that appear in the story, is taken from a modeled base with approximately 7000 faces (that is why all dwarfs have, to a lesser or greater extent, that number of polygons that structure their mesh).

Moyka

Moyka was a challenge, since it involved making a longer model (it should be remembered that the more difference there is between length and width, the greater the number of mesh divisions) than the average of the other models, but keeping the number of polygons stable. This was achieved thanks to the use of the *decimate* tool (widely used during this work) in several iterations, thus keeping the polygons that make up the body and hair (where the greatest number of faces are concentrated) in an acceptable number.

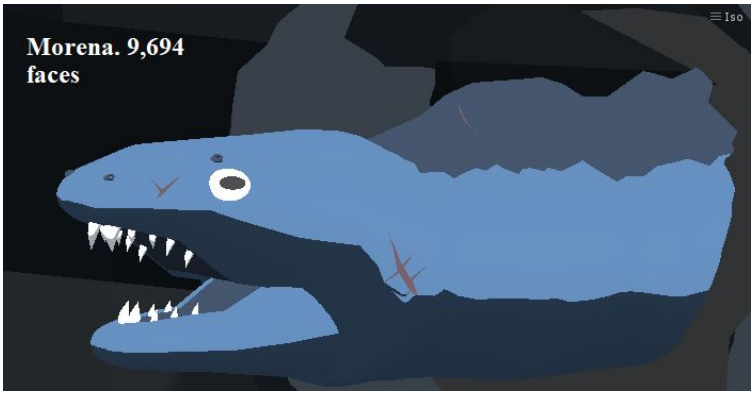
There are many more characters (to be exact, there are a total of 47 models, not counting the possible variations in color and scale that have been made in the scenes), but to avoid lengthening this section further, it is time to show the enemies.

Esmoche

Esmoches are the simplest enemies of all. They are spherical shaped enemies that adhere to the player's body.

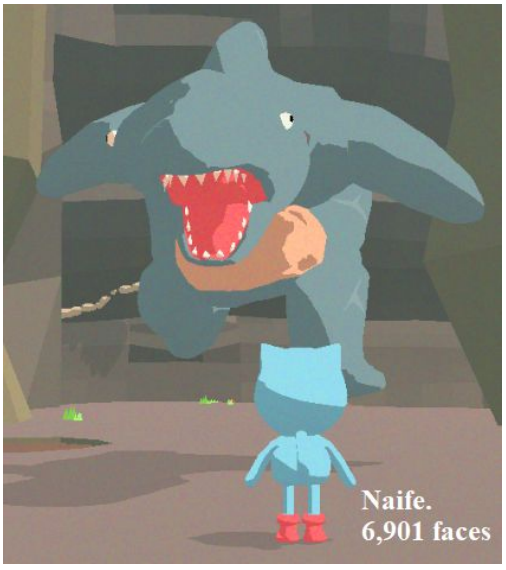
Morena

This model has a mesh in the shape of a snake, according to its way of attacking (leaving a hole and returning to it). It only has a single animation, but the movement itself in and out of its hole (these holes are, in addition, another model) already makes it easier to understand on a visual level.



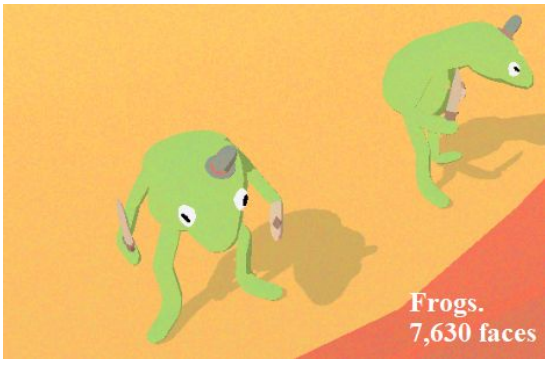
Naife

This enemy is, by its structure, the most complex (although not in terms of its animations and way of attacking, since the frogs have a more developed procedure). It is also interesting how this model has been used to cut it into several parts and, through some adjustments in the coloring, to leave pieces of the mesh as corpses during the third scenario. Like other models already mentioned, this character has polygons made by direct cut in the mesh to emulate wounds, scars, etc. Changing the different wounds and the general color of the model enriches the visual experience.



Frog

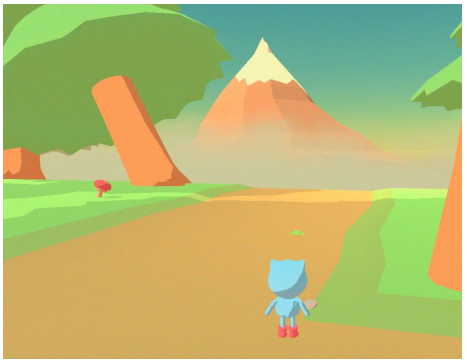
Frogs have a rather unremarkable complexity in their mesh. This complexity is given more by its set of animations, which supports a much more developed AI visually than the rest of the enemies.



3.4.5 Stage design

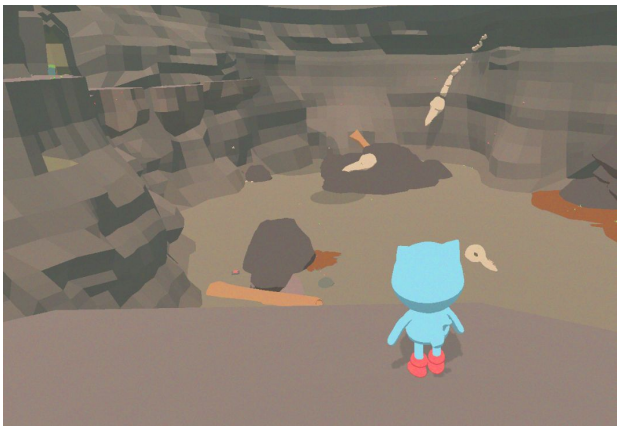
Four scenarios have been designed, attending to four specific needs (as noted above, in the level design). Next, some game captures will be shown so that the result can be observed.

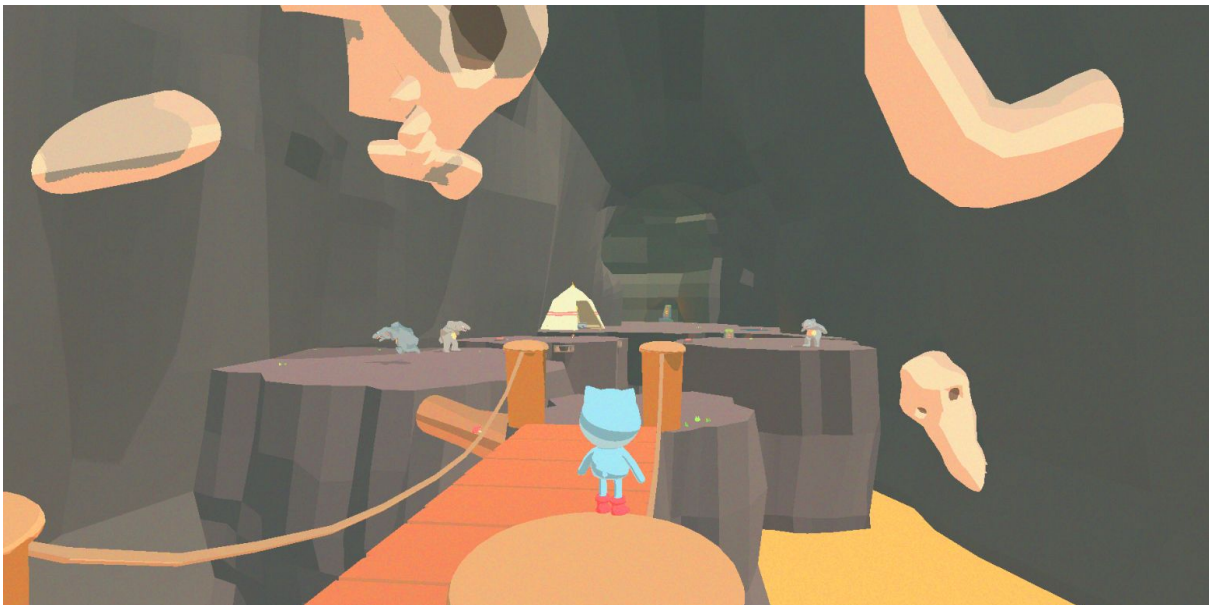
First stage



Second stage

Third stage





Fourth stage

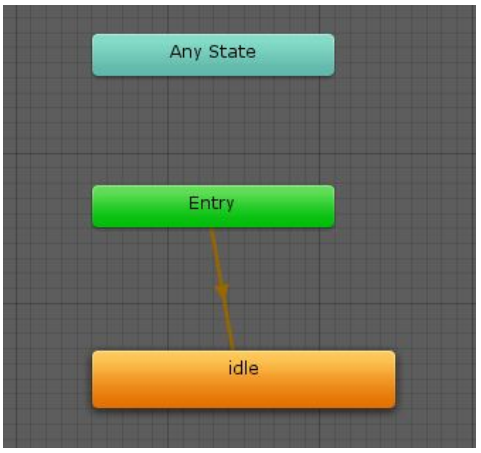
It has been important to take into account the different shades used in the floor so as not to produce an overlap between the different planes.

Furthermore, each element in the scenarios has its respective collider. This is something very important, as it defines the player's framework for action. Beyond mesh colliders and colliders based on geometric figures, in this game colliders made from un-rendered 3D models have also been made (this is especially useful when it comes to easily closing the environment).

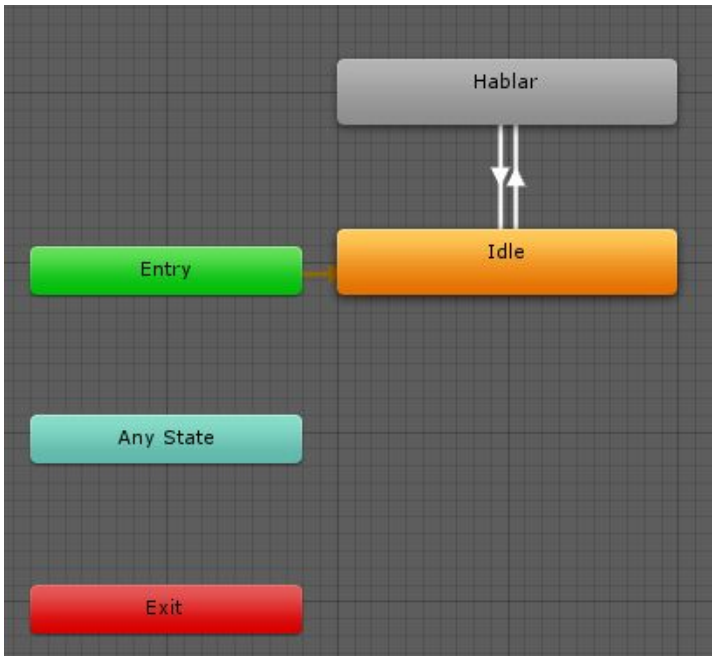
3.4.6 animations and animator controllers

This section can be divided into 3 subsections, both for animation and for animator controllers.

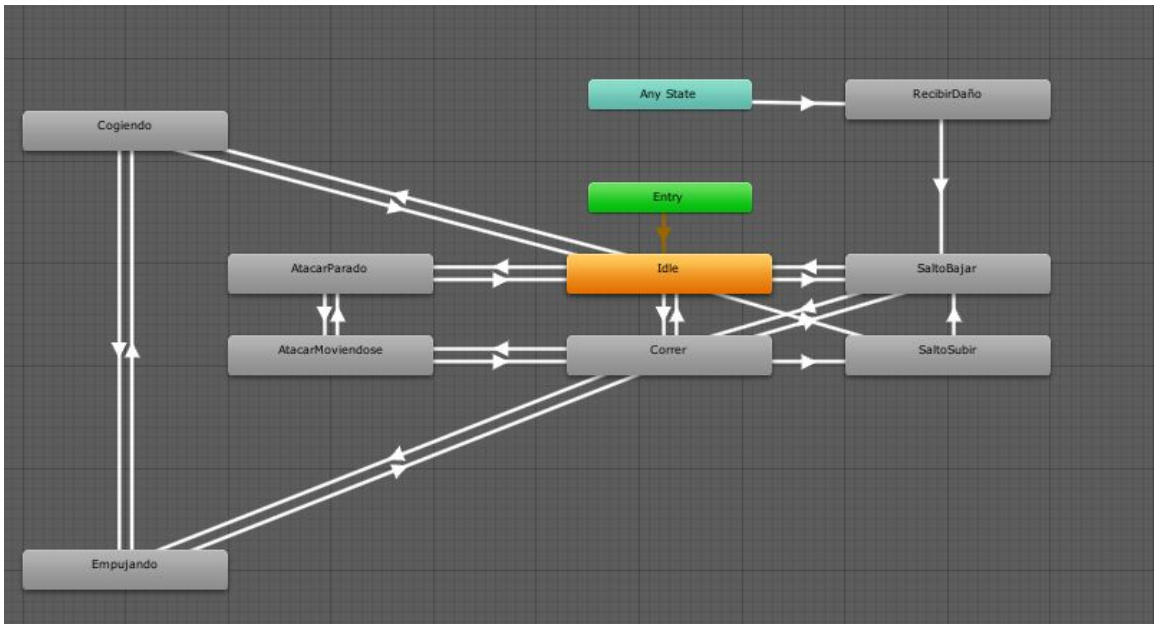
1. **Objects that only have an animation**
   They are those elements whose operation is based on an indefinite loop of the same animation. This occurs in my work with elements of nature: grass, mushrooms, etc. The animator is extremely simple.



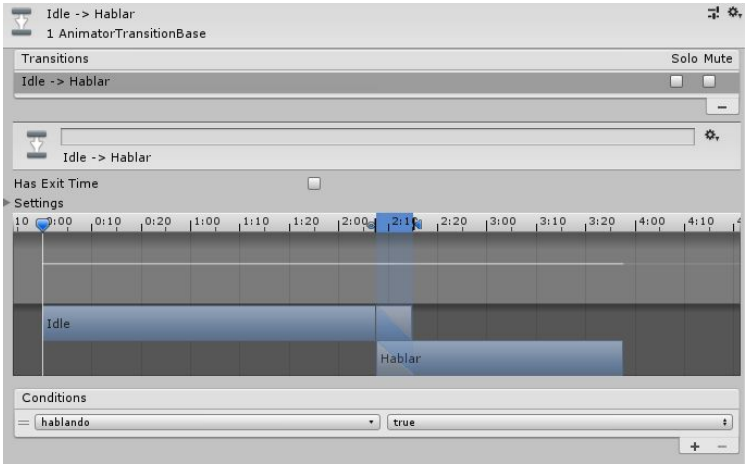
2. **Objects that require minimal interaction**
   These elements take the previous state one step further. This group only has two states: the idle that the other elements already have, plus an animation expressly made for when the player focuses his attention on them.



3. **Objects with complex interaction with their environment**
   Here are grouped the main characters (who react to different states with different animation) and, on the other hand, their enemies (in this case only the last two mentioned in the previous section).

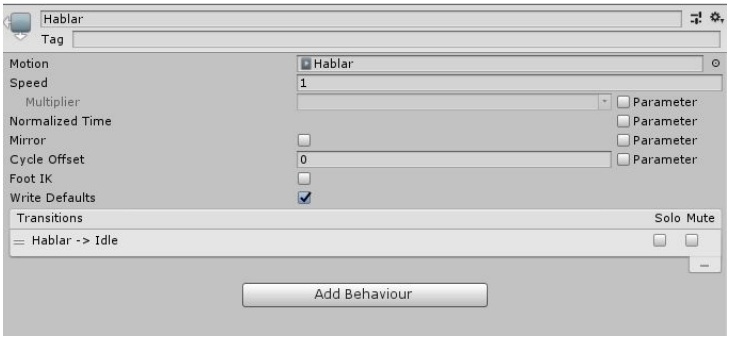


The three types of animator controllers are made up of two parts: on the one hand the **states box** (where you can choose the speed at which the animation should be played and the clip that has been placed from among all the animations of each character) and on the other the **arrow**, which is where the transition is managed, creating a condition with a specific parameter that must then be programmed in the corresponding script.



This image corresponds to the configuration of the arrows. The most important things here are the conditions (in this case, as you can see, it is a Boolean) and deactivating the "Has exit time" option, which usually causes problems with the quick change between states.

On the other hand, this is the inspector of the state boxes. Really the only important thing here is the parameter *motion*, where the animation in question that interests us should be dragged. Of course, that animation, in case you need to loop for an indefinite time, will need a little change in its parameters. This implies activating the *loop* option and saving the changes to the clip in question.



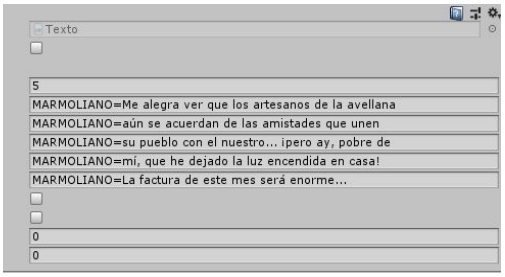
3.5 script programming

The programming closely linked to the graphic section (shaders, particles, etc.) has already been shown. This section is related to scripts, responsible for carrying out certain functions within the project.

3.5.1 *Texto* script

To manage the dialog boxes, a script called ***Texto*** has been used. What this script does is show the canvas on the screen with a box to display the text. In this box there is a specific line for the character's name and another for the dialogue itself. At the programming level, the differentiation between the two is managed by the = symbol. Entries were made publicly to fill them more efficiently and allowing reusability. Each character that can be interacted with has a collider configured so that, if the player is inside it, it is allowed (thanks to the trigger that it works) to activate the text. On the other hand, when activating the event the camera and the NPC are squared in such a way that what is happening can be understood visually.

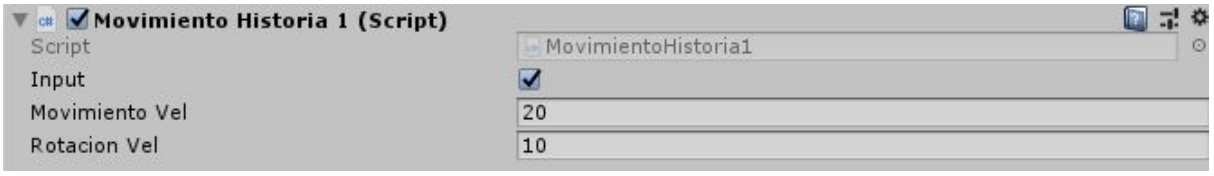
This is an example of all that has been said:

DIALOGUE	**CONFIGURATION**	**RESULTS**
MARMOLIANO *"mí, que he dejado la luz encendida en casa"*		

3.5.2 *MovimientoHistoria1* script

This script manages movement within basic standards. It makes use of the animator of the character in question (whose configuration must be taken into account for it to work correctly), in addition to its character controller. Movement is performed based on the value of the *MovementVel* parameter (which is managed directly by the inspector). Its counterpart is *RotacionVel*, in charge of storing the model's turning speed.

It also takes into account gravity, which is a relevant aspect in case of unevenness (as occurs with the scenarios of this project).



3.5.3 *Fundido* script

This script is in charge of managing the changes between the four scenes in an orderly way, allowing you to present the elements that make up the project without having to manually change the scene. It is programmed in such a way that it interrupts when it notices that the P or O buttons have been pressed. This automatically causes the alpha to rise to a black background to give the feeling of smoothly switching to another scene. The transition is repeated by lowering the alpha to present the new scene as soon as it has been fully loaded. Regarding the P and O buttons, the first is used to advance to the next scene and the second is used to return to the previous one.

You really should not take this script as something that should be in a video game to use. It is rather a tool that as a developer is very useful when it comes to testing.

3.6 Sounds

In the final result, only one composition can be heard, configured in the first scene of the project.

The song (as a *demo*) followed the same procedure that would have been done if all the means had been nearby: after composing the song with the instruments, it was recorded separately with an audio recorder, and then put together harmoniously in Audacity.

Chapter 4
Work Development and Results

Contents

4.1 Work Development

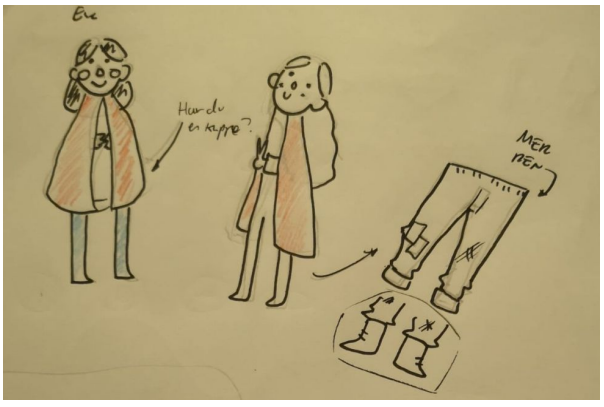
The development of this project can be explained by dividing it into three sections, attending to three different work dynamics.

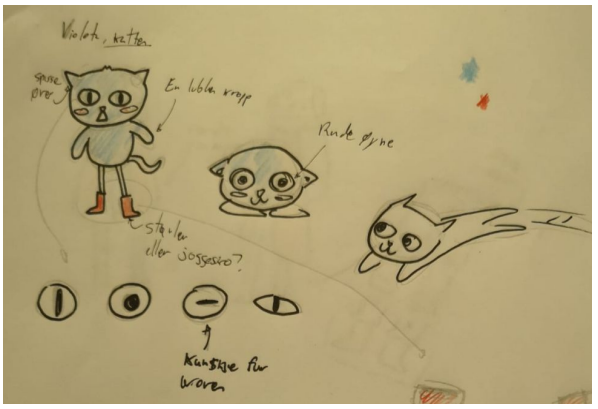
4.1.1 Approach phase

This phase corresponds to almost all of the first month of work. In it, all the key elements of the project were defined: the number of scenarios to be carried out, the structure of three stories that would serve as a vehicle to show different facets of conceptual and graphic design, the mechanics, etc.

Although the substantial elements were defined, it is important to make clear that nothing was closed at that time and that therefore work began on a very generic basis, making an approximation on the number of models necessary for the project.

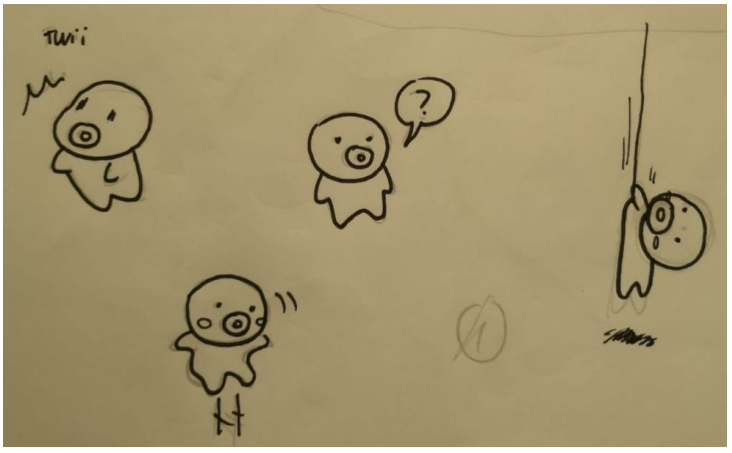
Here are some examples of initial main character sketches. As can be seen from the images, the design methodology is based on treating each component of the future model independently (body, eyes, etc.) in order to have a clear idea about how to transfer it to the 3D tool.





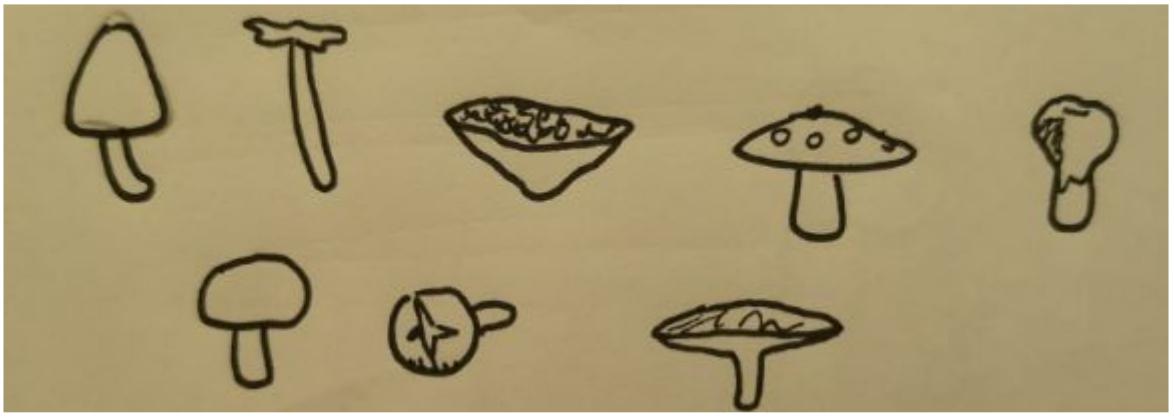
Eva, Violeta and Abedul had a very similar initial conception. That is because the three designs have a very similar structure.

However, Twii was different. It is a very old design that was recycled for this project, since it required a character with which to focus on his movements instead of his design. That is the reason why the various pages that make up his sketches are, for the most part, like this:



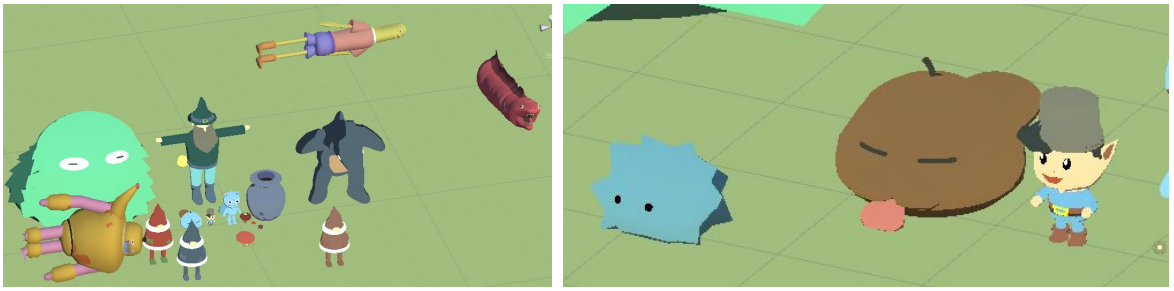
Furthermore, the enemies and NPCs were devised with their skills in mind, not their designs. That is why, when it came to modeling, the previous designs were so schematic. Here are the sketches of the frogs and Faisano:

As for certain objects with variations, encyclopedias and the Internet were useful to see different variations of the same element (like mushrooms) to have visual references. Finally, the number of sketches was reduced until, in this case, there were 5 final designs.



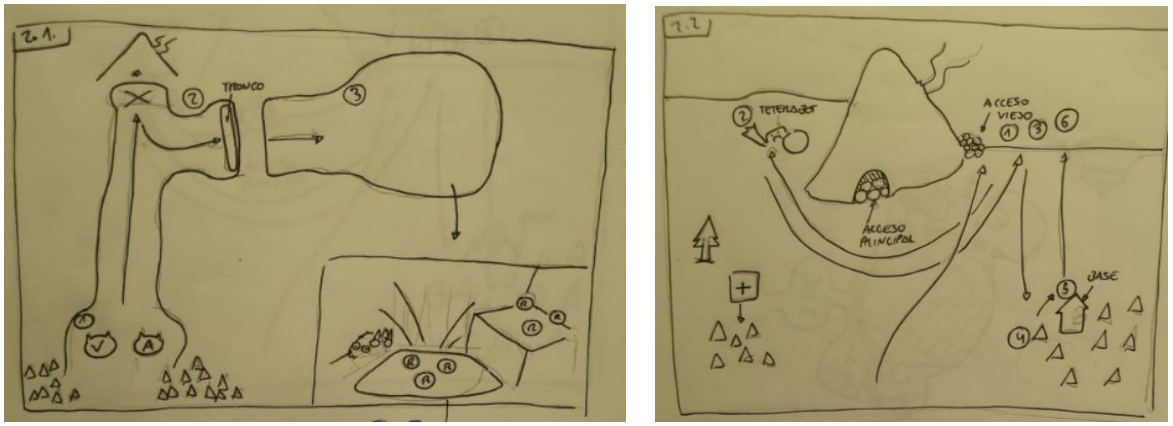
Having the defined mechanics and the number of characters that would appear in the project as a minimum, these designs were modeled in a test scene to define aspects related to color, lighting and

basic movement. This scene was used repeatedly, especially when you did not want to overwrite certain project data in official scenes.



As you can see, in this scene there are not only characters that appear in the final cut, but there are also those whose implementation was not possible, or size variations to know how much each thing measures. It also seems interesting that the image on the left shows the original materials (those exported from Blender) of some characters. It is possible to get an idea, in this way, of how part of the work carried out was destined to make the models made visually attractive.

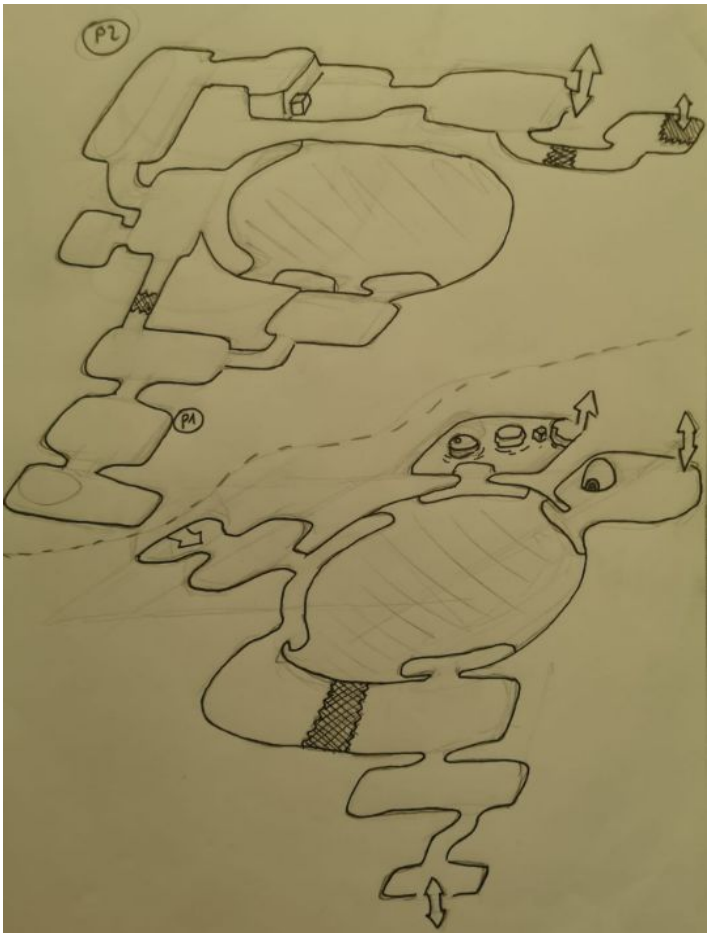
In parallel, the levels were being done. Below you can see some of the schemes in their earliest phase. In this case the images correspond to the second scene of the second story.



These are the first versions of scenes 1 and 2 of the cat's tale. Despite being quite primitive versions, the key areas for the development of the video game were already defined. However, the same cannot be said for the mine scenario.

The mine scene required all the mechanics to be programmed, not only those related to this project, but also those that were not its competence (which were taken as assets). However, these assets were developed so slowly that most of the models were already made when the use of those assets could be closed. That is why a lot of work had to be done in adapting the model to the specifications of the external assets, causing several changes.

These images correspond to the second version of the scenario. It is very similar to the first except for some arrangements in the communication between the upper and lower floors.

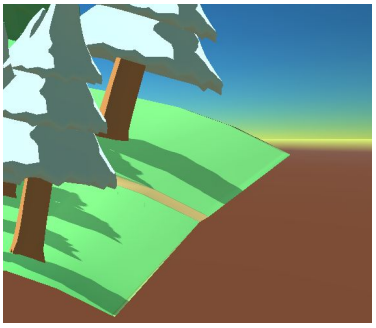


To come up with a version good enough to start modeling, 4 or 5 more versions had to be made, adjusting some aspects each time, in order to refine the design logic.

With all these sketches well planned and some already modeled, the scenarios were assembled.

4.1.2 First phase of development

This phase (characterized by being the one that had hours to cement the work methodology that would be perfected later) began with the creation of the first official scene. Its development was quite short, since there was no NPCs, the main characters were already modeled and animated and the original scheme was very well defined.



The main problem encountered was how to delimit the space without realizing the end of the model. For this it was decided to use a particle system to emulate a fog that encapsulated the area. But it was not totally infallible, since the limit given by the model of the mountain that is in the background continued to look bad. Then a visual trick had to be used, which consisted of folding the model to give a sense of continuity, as shown in the photo.

On the other hand, it was at this moment that another big problem appeared that caused a break of a few days: lighting. A few issues have already been fixed, but at that time none of the lighting parameters had been configured. It took a while, but it was all finally understood (thanks to the *Unity* documentation) and the issues resolved.

The next scene was the most complex in terms of the number of characters and elements it required. It took around 3 weeks to get it well enough to move on to slightly more generic models, coming back to this scene some time later to cover the model's boundaries (Something much easier in this case, not just thanks to the use of particles but also due to the possibility of lengthening the model limits indefinitely without the need to add polygons). The last thing added to this scene was the black plane (especially needed to fill in the hole space), dialogues, and the teapot model on a table.

During that time, the sound began to be composed, focusing on extra-diegetic compositions and then making the internal sounds of each scene. However, due to certain complications, this section was reduced to a single audio track.

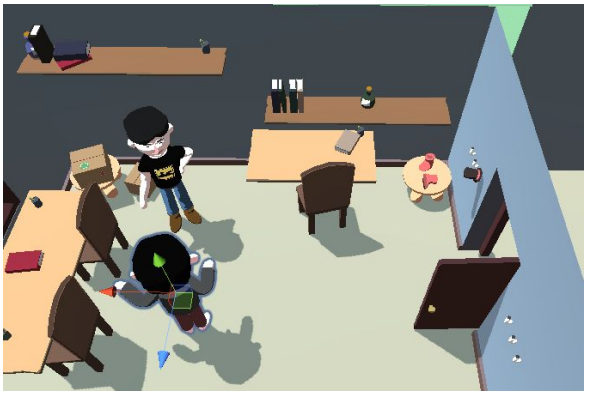
4.1.3 Second phase of development

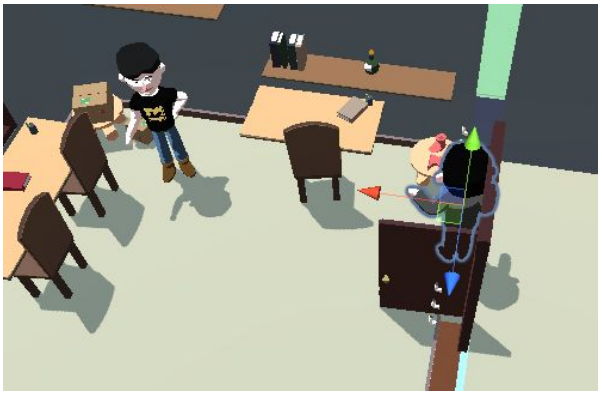
At that time (where the process was streamlined as the planning was quite well defined), the largest stage of all was performed, Twii and Eva were modeled and the house was designed for the fourth scene. The most notable thing about this phase, undoubtedly, was the creation of the mine. As mentioned above, the mine had gone through an iterative process so that the different levels made sense of each other. The big difference in the 3D version is that an underground area and some hallways were added. When the complete model was finished, the work was done on the coloration, since the planes of the different areas had to look good when they overlapped in space. On the other hand, a very subtle gradient was also made (basically it consists of making a gradient from a dark reddish tone at the bottom of mine to a grayish blue at the top).

At one point, scene 2 and scene 3 began to finish almost evenly, especially when the mine was practically finished (at that time only the top soldiers needed to be placed in the third scene).

As soon as the little details in scenes 2 and 3 were finished, scene 4 was the next to be worked on, as all you had to do was fill the stage. That took a few days, finally leaving the inclusion of two models, which completely closed the scene..

The last thing that was interesting to show, because perhaps it was the last lesson that could be drawn from this work in the visual field, is that many times the logical solution is not the most appropriate. In this case, it is intended to show a detail that is only perceptible outside the camera and that without it the view of the room where these two characters are located does not work well.





Indeed, the interior of the rooms is scaled to a greater extent than the building itself. This precisely seeks to magnify the models with respect to the size of Twii, in addition to giving a feeling of shortening of each room.

To finish, since the sounds could not be done in the correct way, it was interesting to at least program and modify some audio track, so some audios from a year ago (used for the Engines project) were taken and placed in the first scene. The first thing that was done was to transcribe the tablature (only the interesting part was removed, which was the body, with the guitar) and then the tracks were retouched in Audacity. Finally, the result was put on an empty object in the scene in question.

4.2 Results

As a result, a project has been carried out consisting of around 100 models (not counting, of course, the possible variations in color and size in the scenes), basic scripts to show the work, four scenarios with totally different specifications for each one. another, an exemplification of classic narrative applied to a playable context, and an approach to using audios in a game.

The result is practically what you were looking for if you use the task table shown at the beginning of the document as the basis of what was expected from the project. The only variation has been in the tasks related to sound, where there has been a limitation outside the development of the work.

Chapter 5
Conclusions and Future Work

Contents

5.1 Conclusions

The conclusions that can be drawn are several of different types. Probably the most interesting are the following:

First, the relationship between the evolution of the story and the video game. There is still a lot to contribute so that the majority public can take the video game as the logical development of the field of narrative. It is interesting to analyze, beyond this work, that fact. For millennia, two of the greatest fundamental pillars in the growth of the human species have been stories and games. That for a few decades they have found a point of confluence is something completely historical. This project, through the small section analyzing Eva's story, has tried to show this event, as a small step that is taken to better understand the phenomenon that has been described before.

On the other hand, there is another valid conclusion about the project: the fundamentals of graphic design stated by Wucius Wong [3] (which has been worked on internally to make the characters, objects and settings) are equally valid in 2D section (for where they were conceived) as for a three-dimensional format such as this work. This is something very important that was not fully included, however, when analyzing each problem related to the visual aspect, it turned out that it had to do with these fundamentals (for example, the initial complications about how to differentiate the heights of the stage of the mine were solved using the principles of overlap and union [4]).

In short, the conclusions that have been drawn have to do with an area not yet fully explored and that will be very important in the future, especially for those low-budget games that want to exploit all the possibilities of their designs.

5.2 Future Works

The results in a practical sense of this project have not been proposed for the purpose of continuation. However, the conclusions about the treatment of graphics in the video game sector and the management of projects of considerable size will be used in future works.

Bibliography

- [1] *Morphology of the Folktale* (Propp, Vladimir. 1928)
- [2] *How to Tell a Story* (García Márquez, Gabriel. 1995)
- [3] *Principles of Color Design* (Wong, Wucius. 1992)
- [4] *Principles of Two-Dimensional Design* (Wong, Wucius. 1972)

Annex

- **Storyboard of all the cinematics of the second story.**
- **Github repository where the project is located.**
- **A brief gameplay of the project.**