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**Visual Development as a tool for storytelling in animated
feature films**

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Abstract

This dissertation aims to study and deepen the understanding of Visual Development and the way it is used towards storytelling.

In animated feature and short films every element is studied and created in order to help the viewer understand the story. We will study concepts like color and light to understand how they are used in order to create an emotional connection between the animation and the viewer.

The animated film ‘Beauty and the Beast’ (1991) from Walt Disney studios will be the test subject for this dissertation and we will analyze its visual elements to understand the way they convey emotion and how those emotions connect to the evolution of the story.

For the final project in computer animation, we propose to apply these findings towards a better understanding on the matter of Visual Development. The visual elements will be approached in the way they were idealized and studied in the pre-production stage and in the way that they were executed in the production. We will also establish their connection with the progression of storytelling.

Keywords: Visual Development, storytelling, color, light, emotion, viewer, pre-production, Animation

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1. Introduction

1.1. Introduction to the research subject

The main objective of this dissertation is to clarify how visual development, through the use of different mood settings, can work towards storytelling. For that purpose, subjects like color and lighting will be approached in such a way as they can contribute to the understanding of a given story.

In the world of animation, where, thanks to computers and technology every detail can be controlled, visual development can work towards the creation of a specific emotional setup. The knowledge of how different elements can affect mood and induce emotion are of main importance.

“Visual development artists design and develop the look and feel of feature films, animations, videos, and other types of productions. In animation, they come up with ideas for what the animated world should look like based on the story, characters, and action. Visual development artists also work with character emotions to help assist with the storytelling aspect of the animation. (...) Visual development artists work with the creative departments at any given company to develop backgrounds, colors, lighting, environments, and props for the animated piece. They use animation, illustration, drawing, and design skills to create visuals that convey ideas about how they envision the look of the film”¹

In the production of an animated film, visual development starts right from the beginning when conceptual drawings and sketches are made to give form to the idea. These studies, which are made in the search of a visual aesthetics to start with, are called concept art. During this stage, color, light and shape are used to roughly translate the general aspect of an idea. This becomes a guideline for the rest of the production pipeline². Color scripting is also used somewhere in the pipeline, where the ‘key frames’ are put together to gather the general reading of mood transition. In this study we will consider that visual development only ends in a given production at the lighting and post-production stages. This is where the final result comes out,

¹ <http://www.animationcareerreview.com/articles/visual-development-artist-career-profile>

² Production pipeline is the distribution and order in which all the components of an animated film have to go through the different animation departments.

which in productions like those created by Disney or Pixar, are mostly faithful to early concept studies.



fig.1.1. Concept art by artist Mary Blair and final result in Disney film ‘Peter Pan’, 1953

The essence of animation, whether we are talking about feature or short films, is to tell a story. All the elements in the production of such movie have to work together towards that purpose. It is all centered on the storytelling and, in order for such a story to work, it has to emotionally provoke the viewer. “The goal of filmmaking is to have the maximum impact upon the audience emotionally while challenging them intellectually. Film is about emotional truth, not logic”³.



fig.1.2. Concept art by Lighting and Color Art Director Dice Tsutsumi and final result in Pixar film ‘Toy Story 3’, 2010

This dissertation also aims to become the basis for the Visual Development of the final project in Computer Animation.

³ Glebas, F. (2009), p.314

The final project consists of a short animated film. It is about an old man who, one evening wakes up in his living room to a strange sound. As the sounds get louder and an evil presence approaches him, the man gets terrified to the point of doing something crazy.

It is a comedy/horror 3D animation lasting approximately four minutes. Since it is relatively short, we had to rely on all the elements to translate the story. My role in this project was to direct the visual development elements in order to maintain it coherent, to engage the viewer and most of all, to tell the story. This dissertation produced the support necessary for this endeavor.

1.2. Methodology used for the research

This dissertation intends to provide deeper knowledge on the problematic of Visual Development and to be the support for the understanding and execution of the Visual Development of the final project. In a way, the final project's short animation can also be seen as the outcome of these theoretical studies. The theoretical investigation was produced sometime before the production phase of the project, although some of the visual and conceptual studies were executed earlier in the pre-production stage. Some conclusions were only reached after putting some of the studies into practice on the project.

The main research elements for this study will consist of literature on the matter, such as visual development studies, production artwork records and essays on the historical progression of animated films. We will give special attention to written papers, articles by other students and researchers and also websites and blogs on concept art, color, lighting and visual directing. Lastly, and at the same time, we will produce an analysis of some animated feature and short films. This analysis will consist of the viewing of said films, while researching the art created and process used in the visual development of their production.

1.3. Organization and structure

The main subjects of our study will be introduced and explained towards the best understanding of the following chapters.

After an introduction to the subject we will advance into the chapter of Visual Development analysis. In here we will try to understand what the visual development of an animated film is. We will begin by explaining a little on the topics of color and light so that we can delve deeper into the way these are used as tools for storytelling. We will also approach some of the tools used in Visual Development, such as concept art and color scripting.

In the next chapter, regarding the topics studied, we will try to analyze an animated feature film in order to better understand the various visual elements contained in it and their development. Topics like characters, sets, color and light will be discussed to comprehend how they were used in story development.

In the following chapter we will explain and examine the visual development of the final project's animated short film. Here we will explain how the conclusions obtained in these studies were useful for the development of this animated short and how they were applied. We will provide an in-depth analysis of how all the visual elements, like sets, characters, light and color were used to guide the viewers in the development of the story.

Finally we will gather some final conclusions on the studies we made and the way these were applied to the final project.

2. Visual Development – color and light for mood setting

2.1. The importance of Visual Development for mood creation

“Visual Development is the early stage in production where all the different ways to translate a story idea into visuals are being explored.”⁴

The process of visual development during the production of a film starts at its beginning and carries through until the post-production stage. It is an effort to establish a distinctive look that works coherently with the story.

When it comes to the visual development of a given film, one of the main concerns of the artists is to create a believable world. As viewers, we willingly want to be submerged in this world, create connections with its characters and feel what they feel. The role of the visual developers is to use the tools at their disposal to guide us, the viewers, through this emotional journey.

In this sense, every detail must be planned to maintain coherence and should work together with the story being told. In the words of director John Lasseter:

“Every single element in a film must support the emotional arc of the story, which is really the emotional journey of the main character, and I’ve felt that the two things that communicate the underlying emotion of a movie better than anything else are music and color.”⁵

Establishing different moods is of primary importance in the visual storytelling of an animated film. It is possible to understand from the visual elements of an isolated scene, even disregarding the rest of the story, if we are watching a dangerous mood or a relaxing one. We can even understand, for example, if the main character is feeling gloomy just by looking at visual elements like color and light.

For example, in the following image, from *Pooh’s Grand Adventure: The Search for Christopher Robin* (1997), we can perceive from the visual elements a gloomy and sad atmosphere.

⁴ Bacher, H. (2008), p.44

⁵ Amidi, A. (2011), p.7



fig.2.1. Scene from Pooh's Grand Adventure: The Search for Christopher Robin (1997)

In the words of Jeremy Cantor and Pepe Valencia, authors of *'Inspired 3D Short Film Production'*: "(...) the look of your film will help to create a mood (...). A dark and rainy atmosphere with lots of grays and blues might make your audience feel cold, as in the opening shot of Red's Dream from Pixar. A bright, sunny landscape with plenty of soft yellows, light greens, and other earth tones will probably make your audience feel warm and comfortable. A bright red and orange sky, cracked surface texture, atmospheric haze, and perhaps one or two cacti should bring out a few portable fans. Clear blue skies, a snow-covered tundra, and a resident penguin will create the opposite effect (...)." ⁶

2.2. Color

One of the most important tools used to transmit mood or emotion is color.

"...color is so charged with feeling and provokes such a strong response in an audience, it is one of the most powerful tools at a filmmaker's disposal." ⁷

To understand color, a few ideas need to be approached. Color is not something that just is, color is something that is perceived.

⁶ Cantor, J., Valencia, P, (2004), p.98

⁷ Amidi, A. (2011), p.7

Johann Wolfgang von Goethe was one of the first researchers to pursue the studies and theorization of color in the nineteenth century. In his attempts to organize the chaotic aspects of color, this German enthusiast came up with three sensual-moral categories to organize the color wheel: “powerful”, “gentle” and “radiant”⁸. Not only do we perceive color, but we also interpret it. In this research there is already a connotation that different colors transmit different emotions. Following his studies the French Professor of chemistry Michel-Eugène Chevreul, who proceeded by reaffirming that no color exists in isolation. We can only perceive color in relation to other colors⁹. Also, the works of the German physicist Hermann von Helmholtz are of great value to the understanding of viewing colors. He claimed that our retinas interpret color sensations accounting the effects of light and neighboring colors, or as Daniel M. Mendelowitz explains:

“Color is an optical sensation produced by the various wavelengths of visible light that form a narrow band on the known spectrum of radiant energy. White (or apparently colorless) light, such as that emitted from the sun at noon, contains all the colors of the spectrum – violet, blue green, yellow, orange, red, and their innumerable intermediate gradations – so balanced and blended that they become isolated only when a beam of white light is passed through a prism (...) When light strikes an object, some of the component rays are absorbed and others reflected. The reflected rays determine the color we perceive. Thus, a lemon absorbs almost all light rays except those for yellow, which reflected to our eyes give the lemon its characteristic color. Leaves reflect mostly green rays, and therefore we say that leaves are green.”¹⁰

In this study, since it is regarding color as it is used in animated films production, we will analyze color as the way we see it on screen.

Color possesses different attributes that change the way it is perceived. We can define a color through its hue, value and intensity/saturation. Hue defines where in the color spectrum the color lies. It can go from violet to blue, green, yellow, orange and red.¹¹ White and black are not considered colors, as they are both extremes in the grey scale, which defines the value. The value demonstrates the amount of black or white being bounced off by the surface. A color will look brighter or darker depending on the

⁸ http://www.colorsystm.com/?page_id=766&lang=en (consulted at 20/01/2014)

⁹ p.14, Gurney, J. (2010)

¹⁰ Furniss, M. (1998), p.72

¹¹ *idem*

amount of light it reflects. The saturation shows the amount of brilliance emanating from a color. A color can go from pure to a tone of gray depending on its saturation.

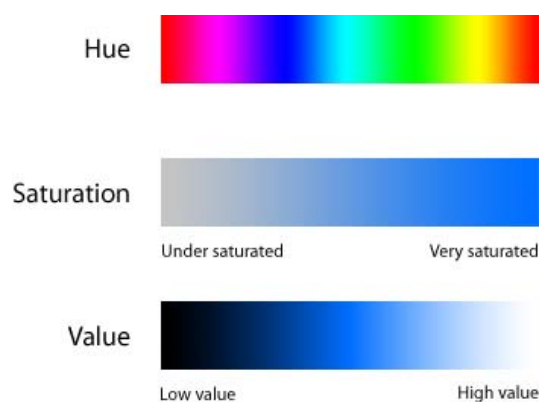


fig.2.2. Graphic representation of hue, saturation and value

The hue of colors can define the general tone of a work. These elements together can define the general tone of a scene. They can define if the colors are perceived as warm or cool. “Warm colors include yellow, orange, red and the colors in-between them, while cool colors include green, blue and violet and the colors in-between them. It is said that warm colors move forward in space and stimulate the viewer. Cool colors, on the other hand, tend to move away from a viewer and are calming in nature. (...) the effects of colors are conditioned by the environment: warm colors might subtly suggest the danger of blood and heat or fire, but cool colors are more familiar in the soothing contexts of the sky, water and plants in nature.”¹²

Color can also transmit senses of space and emotion. Among the experts in using color in this sense were the artists working at UPA studios. UPA - United Productions of America, started out as a studio for the creation of World War II training films. Soon it became one of the North America’s biggest animation producers.¹³ UPA artists were groundbreakers in the aesthetics of their animation. Because it was so stylized, the use of color in their films became of major importance.

In their short, *Gerald McBoing Boing*, directed by Robert ‘Bobe’ Cannon (1909-1964) in 1951, we can see how color was used to establish the mood of the story:

¹² Furniss, M. (1998), p.73

¹³ http://www.bcdb.com/cartoons/Columbia_Pictures/UPA/ (consulted on 12/02/2014)

“At the beginning of the film, color and design are used to create a light and simple background (fig.2.3.), but eventually they become darker and more complex. Background hues become bolder and more pervasive as the tension grows, and blackness envelopes the height of drama, as Gerald leaves home and a train enters the scene (fig.2.4.). Accordingly, Engel¹⁴ underscores his second point: that color can be used to create *any* effect, whether it be dramatic, somber, joyous or otherwise.”¹⁵

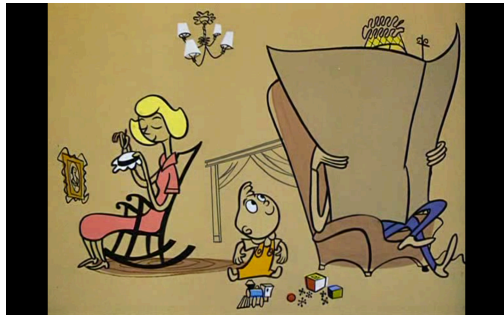


fig.2.3. Scene from Gerald McBoing Boing

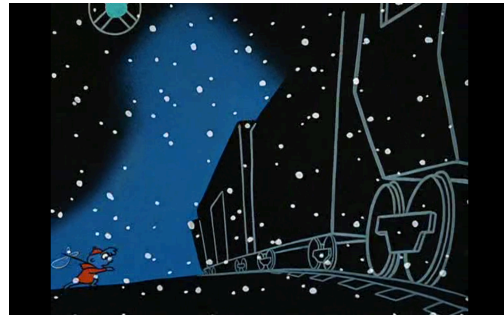


fig.2.4. Scene from Gerald McBoing Boing

The use of color (or lack of it) can dictate the emotional atmosphere of a film or scene. Because of its great mutability, we are able to explore every kind of mood possible. For example, when the mood is happy and light we are confronted by bright colors with high values¹⁶ while, when the mood is dark or gloomy, colors can be very dark and de-saturated with high contrasts.

Using reds, oranges and yellows, can create the feeling of extreme heat but if the objective were the opposite, for example a cool atmosphere, then it would be appropriate to use blues, greens and whites. Warm and cool tones can also be put together to create a more dynamic feel in a specific scene.

Also, by using colors closer to pastels (pastels are pale colors, which mean they are usually high in value and low in saturation), it is possible to transmit tranquility, while using colors that are brighter and more saturated, can create a more energetic and lively atmosphere.¹⁷

¹⁴ Jules Engel, American filmmaker, painter, sculptor, graphic artist, set designer, animator, film director, and teacher (1909-2003)

¹⁵ Furniss, M. (1998), p.73

¹⁶ High values – closer to white; low values – closer to black

¹⁷ Cantor, J., Valencia, P, (2004), p.103

“The mutability of a single color, with its infinite variations of tint, shade, and tone, further, the way it is viewed in relation to its neighboring colors, makes color an effective tool for expressing a variety of mood and emotions.” – John Lasseter¹⁸

2.2.1. Color and emotion

Colors have different meanings to us. They are interpreted by our emotions and the way we feel them is not empirical. We are constantly being faced with symbolic meaning that guide us in the way we experience color. As Eva Heller, author of *The Psychology of Color* explains in her analysis of color: “colors and feelings don’t combine accidentally, (...) its associations are not a matter of taste, but a matter of universal experiences deeply rooted since the early stages of our language and our thoughts. Psychological symbolism and history tradition allow this explanation.”¹⁹

So, the process of interpreting color and giving it meaning is something that starts early in our lives. Colors are used in different ways to affect our quotidian. Bright vivid colors, like red, are used to catch our attention and to single out danger, for example, in stop signs, traffic lights, break lights, fire extinguishers, and such. So, when we face this color in another context, such as in a feature film, we may interpret it as representing danger or alarm. But the same color can transmit different emotions. Considering the example of the color red, it can also be used to represent love and passion. It is the color of the heart, the color of our faces when we blush and the color of roses. “The same color acts differently in different occasions. The same red can be erotic or brutal, inopportune or noble. The same green can appear healthy, or poisonous, or tranquilizing. A yellow that is radiating or that hurts.”²⁰

How is it possible for the same color to represent different, and sometimes opposite emotions? This happens because a color is interpreted in the chromatic context where

¹⁸ Amidi, A. (2011), p.7

¹⁹ Heller, E. (2007), p. 17 “... as cores e os sentimentos não se combinam de forma acidental, (...) as suas associações não são questões de gosto, mas sim experiências universais profundamente enraizadas desde a infância na nossa linguagem e no nosso pensamento. O simbolismo psicológico e a tradição histórica permitem explicar porque é que isto é assim.”

²⁰ Heller, E. (2007), p. 18 “Uma mesma cor actua em cada ocasião de forma diferente. O mesmo vermelho pode ser erótico ou brutal, inoportuno ou nobre. O mesmo verde pode parecer saudável, ou venenoso, ou tranquilizante. Um amarelo radiante ou que fere.”

it is manifested. The main color is affected by the colors surrounding it: “The chromatic combination determines the effect of the main color”²¹.

In her studies of how colors transmit emotions, Eva Heller created chromatic diagrams that represent which color combinations her test subjects associated to different emotions.

EFFECTOS CROMÁTICOS CONTRARIOS



fig.2.5. Color schemes and their respective emotional response

2.2.1.1. Blue

Blue is psychologically associated to the feeling of harmony and trust. As Eva Heller describes, blue is a color that is associated to reassuring feelings. She explains this connection by saying: “The sky is blue, and so, blue is the color of the divine, the

²¹ *Idem* “A combinação cromática determina o efeito da cor principal.”

color of the eternal. Experience made blue the color of everything we wish that remains, of everything that should last eternally”²²

Green can also be a transmitter of this type of comforting feelings as it is deeply associated to nature. Blue represents heaven and green represents earth, both eternal. Blue is also a means to represent great distance and infinity. Warmer brighter colors are only visible at a certain distance, because the further they are the more air molecules we have between them and us. These atmospheric molecules turn colors into a more bluish hue. Painters call this ‘atmospheric perspective’ or ‘aerial perspective’.²³ Blue can also be used to create the feeling of cold, and thus, fear. Dark blues are frequently associated to villains and evil scenarios.

In Disney’s animated feature *Sleeping Beauty* (1959), blue is used as an overall color in the scene where the three fairies put a spell on the castle and its surroundings so that everybody sleeps while Aurora, the main character, is cursed to eternal sleep. The color scheme is very indicative of the emotion in this scene (fig. 2.6.). The blue used here is very relaxing and peaceful and we, the viewers, can almost feel drowsy as if we were also affected by the spell. It also transmits a sense of eternity, which tells us that this is not a normal slumber and that this will last forever if the spell is not broken.



fig.2.6. ‘*Sleeping Beauty*’ (1959)

²² Heller, E. (2007), p. 23 “céu é azul, e por isso o azul é a cor divina, é a cor do eterno. A continua experiência tornou o azul na cor de tudo o que desejamos que permaneça, de tudo que deve durar eternamente.”

²³ Heller, E. (2007), p. 24

In the two following examples (fig. 2.7 and 2.8), the presence of blue transmits the feelings of being safe and of reliability. In figure 2.7, the scene was taken from Disney's animated film *Pocahontas* (1995). It represents the place where Pocahontas feels the safest and where her grandmother's spirit lies. Grandmother Willow is a figure of wisdom and the person who Pocahontas turns to in times of doubt and distress. The colors in this scene give us this reassuring feeling. Figure 2.8 is a scene taken from Pixar's animated feature *Monsters, Inc.* (2001). The color blue here can be understood as comforting. When it is put together with the pinks and violets, the dark blues that could be perceived as frightening are not scary at all. They transmit kindness and again, reliability. In a scene depicting a small girl in her room at night with a monster, the mood could be very frightening, but through the color arrangement, we only witness the sweet bond between girl and monster.



fig.2.7. 'Pocahontas' (1995)



fig.2.8. 'Monsters, Inc.' (2001)

2.2.1.2. Red

Red is a very interesting color as it has the ability to transmit both love and anger. The thing common in both these emotions and in the color itself is that they are vibrant. Love and anger, although very distinct are both very intense emotions and red is an equally intense hue. The combination between red and other light tones, like pink can transmit love, romance, passion and when put together with black or dark tones can transmit anger, hate, danger²⁴.

²⁴ Heller, E. (2007), p. 54

Red can also suggest life. It is the color of blood and so, the color of vitality. Together with blue, they read as body and spirit.

The examples in figures 2.9 and 2.10 show how red can convey evil and danger. In figure 2.9, we can observe a scene from the animated film *Alladin* (1992). It shows us the scene where Jafar, the villain, gets his wish from the genie and becomes an evil genie himself. The red hue, together with the dark background, is used in order to show that Jafar became more powerful, dangerous and menacing. A similar situation occurs in the scene of Disney's *Hunchback of Notre Dame* (1996), where Frollo, also the villain, is realizing his desires towards the female lead Esmeralda. In this specific scene, red means more than just danger (fig. 2.10). Although danger and menace is also implied in it, the red here can be perceived as the representation of lust and desire. Frollo sees Esmeralda as a desire of the flesh and considers her a menace to his chastity.



fig.2.9. 'Aladdin' (1992)



fig.2.10. 'Hunchback of Notre Dame' (1996)

Red is also used frequently to represent love. In the scene in figure 2.11 from Disney's animated feature *Alladin*, Alladin, the main character sees Jasmine, the female lead, for the first time. Red is used to show the intensity of love at first sight and to show Alladin's mood. In the scene from Disney's *Princess and the Frog* (2009), we can see a scene in Charlotte's bedroom (fig. 2.12). The room is all in light red and pink. It shows us the mood of a little girl's room, but it can also be interpreted as the love between father and daughter. The room is full of girly paraphernalia, given to Charlotte by her loving father, Eli La Bouff. The color helps us to perceive this mood and their loving relationship.



fig.2.11. 'Alladin' (1992)



fig.2.12. 'Princess and the frog' (2009)

2.2.1.3. Yellow

Yellow, like red and blue is one of the primary colors, which means that it can't be obtained through the mixture of other colors. It is the brightest of all the bright colors. Its radiance is attached to symbols like the sun, the most intense light known to Man. Its intensity is highly related to the emotions that it manifests, which are very intense also. Yellow is the color of optimism, disgust, lie and envy. It is also the color of light, enlightenment, contempt and of betrayal.²⁵

Yellow is not only unstable in the way we emotionally perceive it. Just a small tint of red turns yellow into orange, and a tint of blue or green can wash away its vibrancy.²⁶

The color yellow can be used to create joyous feelings like happiness, fun, kindness, optimism and richness. This happens when it is used against colors like orange and red. It can also portray darker feelings, like envy, jealousy and lie, especially when it is used together with greener tones.

In the animated film *The Road to El Dorado* (2000) by DreamWorks Animation Studios yellow is predominantly used to show the richness and ostentation of the city El Dorado (fig. 2.13). Yellow is also used with green and black to portray envy and betrayal in a scene of Disney's *The Lion King* (1994). In this scene the character Scar plots the murder of his brother the king with the hyenas (fig. 2.14).

²⁵ Heller, E. (2007), p. 85

²⁶ idem



fig.2.13. 'The Road to El Dorado' (2000)



fig.2.14. 'The Lion King' (1994)

2.2.1.4. Green

The color green is nature. Green is symbolically attached to nature because it is the color of almost all vegetation. Since nature exists on planet Earth before us humans, it is only natural that we associate this color to life and health. Green is also the color of fertility and of flourishing. We also associate green to youth “the state of immaturity is always green”.²⁷

But like other colors, green has its dark connotations. Green is also symbolically attached to poison and to fright²⁸. Forests give us the sense of life and growth but also create a certain fear of its creatures and dark corners. Serpents, alligators, lizards and a lot of other scary animals are predominantly green. We frequently observe the color green being used for depicting evil on animation feature films, for example, on villains, mythical creatures or dangerous poisons.

Green is used as a sign of hope and life in this scene (fig.2.15) from the feature film *Tarzan* (1999) from Disney. Tarzan, the main character, is rescued and brought to the gorillas by his new adoptive mother, gorilla Kala. Again using the example of *Princess and the Frog*, green is frequently used when portraying the evil character Dr. Facilier. In this scene (fig.2.16), green is both representing evil and poison, as the character is creating an evil spell to steal the prince's identity.

²⁷ Heller, E. (2007), p. 109 “o estado de imaturidade é sempre verde.”

²⁸ Heller, E. (2007), p. 114



fig.2.15. 'Tarzan' (1999)



fig.2.16. 'Princess and the Frog' (2009)

2.3. Lighting

“Lighting is directly tied to the story of a film in the sense that it defines the mood for every scene.”²⁹

Like color, lighting is an essential tool in the visual development of an animated film (or a live action film for that matter). Light is a means to point out what is important, to make it stand out in an artistic matter, while establishing a correspondent mood. It is without question tied to color as the intensity of light affects how color is displayed. It is also directly related to depth and composition, as it can contrast a single element from a scene or dilute it by lighting everything with the same intensity.³⁰

Lighting can be used to unify elements in a scene, to establish a relation between them or even to reveal the contrast between them. It also establishes the connection between the elements in various spatial planes, like foreground and background or even of the characters from the background elements. Lighting can be one of the most important tools in achieving an animated film's look and aesthetic.

The way light is used in a scene, like color, can have different mood interpretations. Like Jeremy Cantor and Pepe Valencia³¹ exemplify in their studies:

²⁹ Cantor, J., Valencia, P, (2004), p.99

³⁰ Cantor, J., Valencia, P, (2004), p.99

³¹ authors of '*Inspired 3D Short Film Production*'

- “A single overhead yellowish point or parallel light source will create a warm, outdoor, daytime feel.
- A low, blue light will create a cold, eerie, ominous tone.
- A single bright light source that creates strong white highlights and very dark shadows would be appropriate for an outer space locale.
- An otherwise dark setting with a small, weak light source coming from a candle, a flashlight, a torch, or a lantern will help create a feeling of isolation or suspense.
- Lighting a character from behind will create at least a partial silhouette or an ethereal glow, which might be helpful in mysteries or spiritual allegories.
- A multitude of different-colored lights, spinning and blinking, might imply that your action is taking place in a dance club or perhaps underneath a landing UFO.”³²

The mood of the environment is accomplished by joining the two elements, color and lighting. Of course there are a variety of other components, when it comes to the mood setting of scene, like shape, design, material, and others. For the purpose of this study, these are considered as secondary elements, as all of them are affected by light and color and cannot establish a mood setting on their own.

2.3.1. Light fundamentals in animation

Lighting has different properties that can be very valuable in the world of animation. I find that the authors Jeremy Cantor and Pepe Valencia explain very well the most important ones. They define them as: mood, depth, time, position, form/composition and economy.³³

Mood – Light can create a sense of atmosphere. It makes it possible to characterize a space with different emotional attributes. “Proper application of lighting can help to make a story or scene feel warm, comfortable, cold, or ominous”.³⁴ This allows the audience to have a more believable experience as they progress through the story.

³² Cantor, J., Valencia, P, (2004), p.99

³³ Cantor, J., Valencia, P, (2004), p.360

³⁴ *idem*



fig.2.17. Kung Fu Panda (2008) concept art by Sean Eckols – dangerous mood

Depth – Light can help to emphasize the three-dimensional look of a scene through the notion of depth. With proper lighting and shadow, even in a two-dimensional world it is possible to create spatial relationships that are credible, which otherwise could be confusing.³⁵

Time – With lighting it is also possible to insert the viewer in the proper time of day and create the feeling of progression in time. Even the time of the year is possible to be understood through the use of good lighting.³⁶



fig.2.18. Initial scene from The Lion King – dawn sunrise

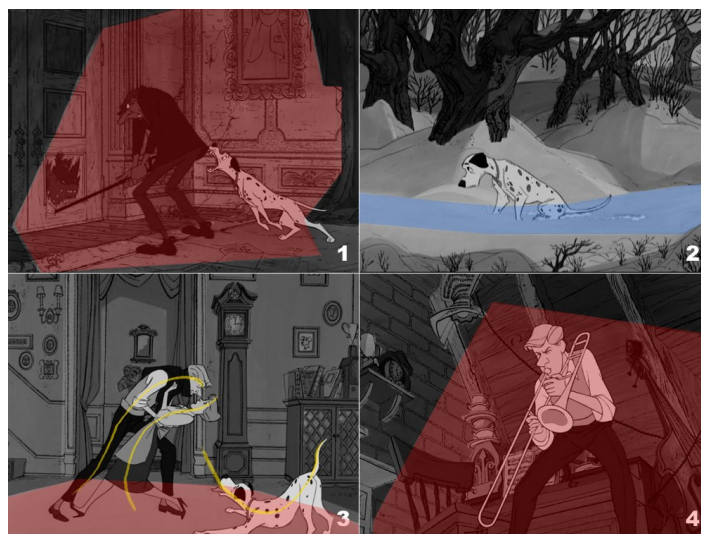
³⁵ *idem*
³⁶ *idem*

Position – The way that light is positioned is essential towards the general reading of the scene and towards the mood creation. A light with the same intensity aiming from different angles will have different attributes and create different relationships between all of the elements. “Lights from above tend to look more natural, but a light from below can be creepy”³⁷.



fig.2.19. Concept art by Paul Lasain for Prince of Egypt (1998) – light from above

Form/Composition – Lighting has the power of revealing and concealing different elements or even parts of them, hence, it has the ability to define form. It can also highlight a section in the set while concealing another, creating a sense of composition and hierarchy.³⁸



³⁷ Cantor, J., Valencia, P, (2004), p.361

³⁸ Cantor, J., Valencia, P, (2004), p.361



fig.2.20. Light used for composition³⁹ in various scenes from 101 Dalmatians (1961)

Economy – Light has to be used with care and planning because over-lighting (or the opposite) can ruin a good scene. It should be used rationally, only to highlight the essential elements and to the limit where it creates the intended atmosphere. This logic should be maintained throughout the film.

Apart from these attributes, light has more specifics that should be taken into account when it is being used, like intensity. The intensity of a light is enough to create dramatic effect. A strong key light⁴⁰ is enough to define the mood in a scene and the use of different intensities can create a more dynamic feel and make a scene more believable.

Light effects can also be applied to enhance the visual look of a film if it goes accordingly to its aesthetics “You can use effects, such as glow and lens flare, to increase the quality of an image and its cinematic feel.”⁴¹

³⁹ <http://colorfulanimationexpressions.blogspot.pt/2008/07/color-in-101-dalmatians-lengthy.html>

⁴⁰ Key light is the main light in the light setup.

⁴¹ Cantor, J., Valencia, P, (2004), p.362



fig.2.21. Scene from *Toy Story 3* (2010) – lens flare used for dramatic effect

2.4. Visual Development tools

Visual development artists do every type of artistic work in order to find character design, set design, props design and every other visual element. In their works they need to express themselves through form, color and light in order to capture the emotion intended. Within the scope of this dissertation, we will analyze some of these works organizing them in two categories: Concept Art and Color Scripts.

2.4.1. Concept Art



fig.2.22. Concept art by Paul Lasaine for Dreamworks animated feature 'Prince of Egypt' (1998)

Concept art is one of the first tools of Visual Development. It is the first visual contact with the idea. Concept art is used to produce studies using form, color and light, conveying a concept, situation and or emotion.

“Just because a film is created with computer graphics doesn’t mean that a computer produces the entire film. Artists conceive of every stage of the film long before the first mouse button is ever clicked, and they use every imaginable art material to develop their ideas: pencil, marker, acrylic, pastel, gouache, and even clay.”⁴²

In the early years of animation, concept art and all the artwork produced in an animated film were seen as a technical element of said production. There was little artistic value attributed to these works, and they were frequently destroyed or thrown away.⁴³ Fortunately the situation has changed and animation studios have started to understand the value of their artwork. Larger companies like Disney and Pixar possess big archive facilities for the single purpose of storing and preserving those priceless works.

Concept art is part of the pre-production of a film. It is the study of an environment that will later be taken into production. If we analyze all the concept art produced for one animated film, we will understand the amount of work that ends up not being used. These artworks are part of the process of trying to find the best look of portraying a given scene. In these concepts, like the name suggest, the artist conceptually transmits mood and emotion in accordance to the story. For example, in Pixar’s animated feature film *Ratatouille* (2007), visual development artists studied how to create the main character’s two distinctive worlds: “We wanted to visually reinforce the idea that the human world is more appealing to Remy, more seductive. So one of the principles we decided on was that the human world would be warm, and the rat world would be cool. The human world would be lighter in value with more local color; the rat world would be darker in value and more muted.”⁴⁴

⁴² Amidi, A. (2011), p.196

⁴³ *idem*

⁴⁴ Paik, K. (2007), p.42



fig.2.23. Concepts from artist Dominique Louise depicting different moods for the animated film 'Ratatouille'

They could have simply been faithful to reality and create these different places (the rat world and human world) from references, but what they did was create both worlds connecting them emotionally to the character and the viewer. As we see the main character in the Paris sewers, which represents the rat world, like the character, we feel cold, discomfort, and a sense of void. As Remy reaches the human world, we are filled with warmth, bright colors and overall joy. This is the main goal of visual development, and it all starts with Concept Art.



fig.2.24. Concept art by Ernesto Nemesio

A singularity about concept art is that it has the ability to give the movie a unique and rich style. The visual development of a film is inevitably dependent on the artists' style. And as each one of them as a different life experience, it is possible to get distinctive approaches to mood and emotion concepts. As the chief creative officer for DreamWorks Animation Bill Damaschke says, "From an emotional perspective, the art in each film is a direct extension of that individual filmmaker's sensibilities and

the unique story he or she wants to tell. We rely heavily on our filmmakers to push the visuals in a new direction.”⁴⁵

2.4.2. Color Script

Color is such an important element in animation that currently, one of the most important elements in the pre-production pipeline is the Color Script.

“...the color script, which allows you to see the whole arc of a film’s color mood at a single glance, is essential in planning and refining the visual and emotional rhythm of a film to support its story. As a filmmaking tool, its indispensable.” – John Lasseter⁴⁶

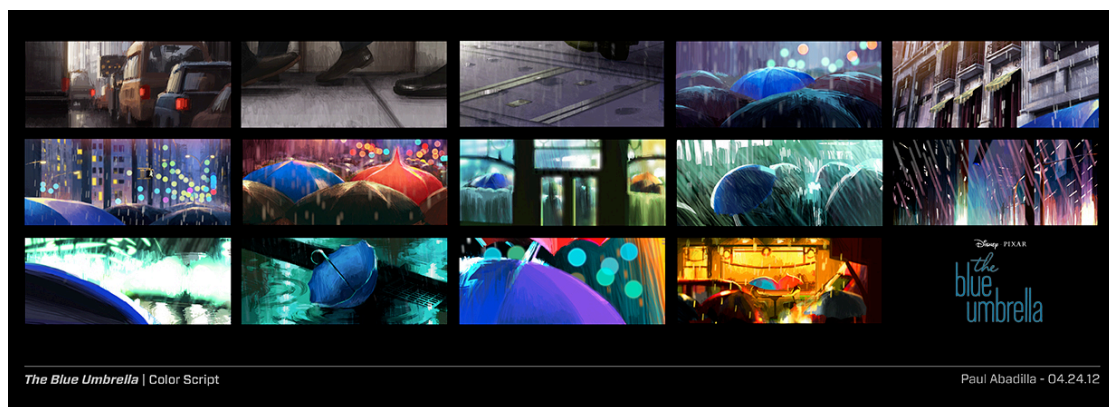


fig.2.25. Color script from the Disney Pixar short *The blue Umbrella* (2013)

The color script is created to maintain a linear logic to the film’s aesthetics. It is like a colored storyboard that instead of representing the action focuses on establishing the mood for every different scene. It is “a roadmap for the way the color (and thus emotion) would be applied throughout the film”.⁴⁷

Color-scripting has its roots in early 40s Disney animated feature films. At the time, Disney artists created conceptual sketches that included color to perceive mood progression, but it was not until Pixar that the Color Script took a solid position in the

⁴⁵ Zahed, R. (2014), p.9

⁴⁶ Amidi, A. (2011), p.7

⁴⁷ Amidi, A. (2011), p.10

preproduction pipeline.⁴⁸ Ralph Eggleston⁴⁹ was the first artist to try this new tool at Pixar in the studio's first feature film *Toy Story*, directed by John Lasseter in 1995.

“As Eggleston tells the story, Lasseter stood there in silence staring at the color script for a minute or two. Then he walked over, threw his arms around Eggleston, and gave him a hug. Eggleston, who was in his late twenties at the time, nearly a full decade younger than Lasseter, had impressed the first-time feature director by giving him a new way of seeing the film. (...) The resoundingly successful reception of Eggleston's work, which had originally been just another piece of exploratory art, cemented the color script as a cornerstone of the production design process at Pixar.”⁵⁰



fig.2.26. Color script from *Toy Story* (1995)

The most significant advantage of the color script over the usual concept sketches previously used is that it is possible to see the entire film in color on a single board. It allows us to perceive how different mood settings connect and progress. This tool evolves along with the rest of the visual development. As changes occur in the scenes or in the aesthetics of the production, it is possible to update the color script and observe if it is still consistent.⁵¹

⁴⁸ *idem*

⁴⁹ Ralph Eggleston is an American animator, art director, storyboard artist and production designer at Pixar Animation Studios

⁵⁰ Amidi, A. (2011), p.10

⁵¹ Amidi, A. (2011), p.11

Pixar has taken color-scripting to a new level as they create works of art with designs specific to their production. In the movie *The Incredibles* (directed by Brad Bird, 2004), the color script takes shapes to their bare essence and represents each and every scene in a very schematic manner.



fig.2.27. Color script from *The Incredibles*

In the animated film *Finding Nemo* (directed by Andrew Stanton, 2003), instead of searching for the different moods through *key frames*⁵², Eggleston's approach was to create continuous panels that would show the emotional progression between scenes. What started out as a tool, is becoming an art form in itself.

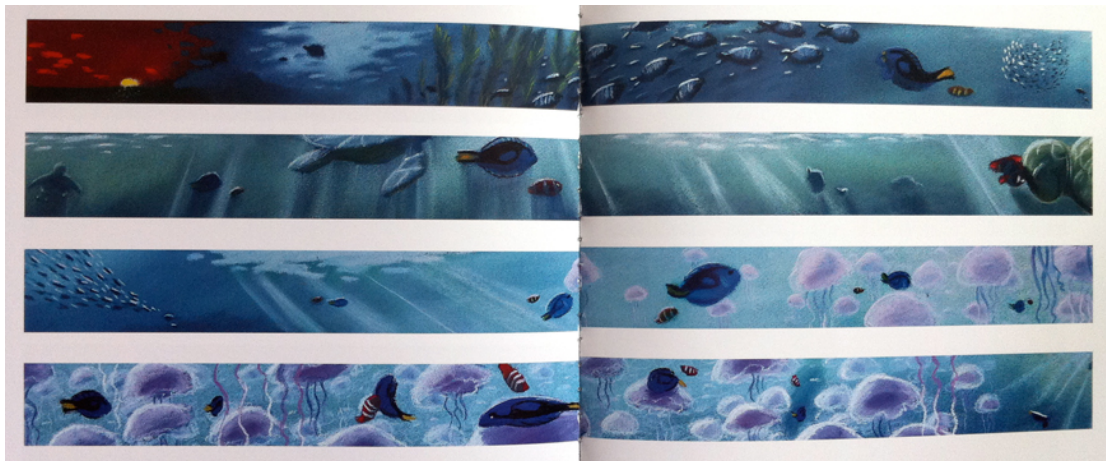


fig.2.28. Color script from *Finding Nemo*

⁵² key frames are frames that define a key action pose in a scene

3. Analyzing Color and Light – case study

3.1. Beauty and the Beast

Beauty and the Beast is one of Disney's much-acclaimed animated feature films by the directors Gary Trousdale⁵³ and Kirk Wise⁵⁴. It was released in 1991 and it was a great success as it won two Oscars for *Best Original Score* and for *Best Original Song* and a *Golden Globe Award for Best Motion Picture*.

The film is known for its beautiful soundtrack and amazing art. The main reason for its selection as the study object in the matter of visual development is because of the astounding work that was done artistically in this movie. *Beauty and the Beast* is rich in various and astonishing environments that perfectly depict the mood of the story being told. The action and atmosphere work in unison in order to provide us, the viewers, with an unforgettable visual experience.

We will analyze this movie and its visual development, concerning the way that lighting and colors were used. The analysis will be separated in to two main topics, which are the characters and the sets. We will approach them in a perspective where we will try to unveil the connections between the story and visual mood evolution.

3.1.1. Characters

3.1.1.1. Beast

The first time the Beast is introduced to us, we have the notion that this character is very dark and evil. Throughout the film, the Beast is the character that suffers the most radical personality change. This evolution is transmitted in a more visible way through the action of the character and his attitudes towards the other characters, mainly Belle. But on a more conceptual level, we can feel that change through the evolution in lighting and coloring involving this character.

⁵³ born in June 8, 1960

⁵⁴ born in August 24, 1963

He first appears (after the introduction) in the fireplace room, where Belle's father Maurice is being taken care of by the house staff. The moment the Beast opens the door dramatically and violently, the fire burns out and the only source of light becomes the door in which he stands. This creates a great lighting contrast where we see this monstrous silhouette framed by a diffuse green light and where only the eyes are visible. At this point, we can only observe a few tints of color, given by the light coming from the adjacent room, which presumably bounces from the interior and onto the character. This immediately characterizes the Beast as someone dark and dangerous.



fig.3.1. Beast's first appearance



fig.3.2. Beast as a dark silhouette

Later in the story, Belle arrives to the castle in search of her father. Finding out that he is being held as prisoner of the Beast, she offers herself as prisoner in the place of her father. As Belle suggests the trade, she asks the Beast to step into the light (a volumetric light cascades from somewhere invisible in the scene, presumably a window or skylight placed high in the tower) so that she can see him. In this scene the light coming down on the Beast allows us to see him clearly for the first time but in a light context, which continues to show us someone scary and dark. We can identify the warm hues of reds and browns that define this character, but at this stage they are very dark and de-saturated, in coherence with the mood and psychological attributes of the Beast. Also, with this kind of lighting, we get a high contrast between light and shadow. While the top of the head, nose and eyebrows are well lit, the area around the eyes, under the nose and the chin are 'cloaked' under shadow. These lighting attributes accentuate the mystery and drama of the overall mood of the tower scene.



fig.3.3. Scene where we first see the Beast in the light. The colors used are dark and de-saturated for dramatic impact. They relate to the character's personality in this scene.

In the same scene, as the Beast offers Belle a room instead of the cold tower cell, she accuses him of not letting her bid her last farewell to her father. In his reaction there is the first sight of his humanity and kind heart. The Beast holds his hand nervously behind his neck and is portrayed for the first time without high lighting contrasts and at full visibility. This allows us to start connecting and empathizing with this character. As his personality starts getting clearer, so does his characterization.

The story unfolds as the Beast learns how to be gentler with Belle and as she starts to see him with new eyes. We, the spectators, are also led to see him with new eyes, so at this point the Beast's character is portrayed in softer colors. He appears, for the first time, in broad daylight and in different clothing. Until now, this character had only appeared in a dark red cloak and dark blue torn pants. In the snowy day scene where both main characters are together in the gardens of the castle, the Beast is shown wearing a white shirt and blue cloak. These color elements, although very subtle, communicate the personality of the character at the given time. At the beginning the Beast was an angry and tempestuous creature and had no control over his temper, so he was portrayed bare-chested, with a red cloak that symbolizes anger and danger. When he starts to become more civilized and in love with Belle, he appears always in a white shirt and dressed in colors that denote more peace and tranquility, such as blues and greens.



fig.3.4. Beast in a white shirt and blue cape



fig.3.5. Beast in a green jacket

The peak of the Beast's transformation occurs in the film's main scene, the dance between the main characters. Here, the Beast is dressed in tones of white, blue and gold, and the contrast between the colors is diluted by the yellow candlelight that takes over the whole scene. This creates a much softer character than the one we met in the beginning.



fig.3.6. In this image we can see the colors used to depict the Beast in this scene. They are of a warmer tone that relates to his warmer personality

In this character's emotional progression there is one last moment, when Belle leaves the castle with his permission. The Beast goes into a depression and again we see him in de-saturated and dark colors (fig.3.7 and 3.8). Although this time, using the same color scheme as in the beginning, we interpret it as gloomy and depressive instead of

dark and dangerous. This happens because of the great animation that we can observe in the expression of his eyes. In the scene where the servants come to warn that the castle is being invaded, the Beast is in his deepest state of depression. The lighting was used here to underline this emotion. The Beast is highlighted in the face with a very soft light coming from outside. The shadows, in opposition to figure 3.3, are not menacing and do not create mystery. They transmit a gloomy and sad state of mind, which suits the character in that specific situation.



fig.3.7. Beast in a depressive mood



fig.3.8. Scene where the Beast is dying

3.1.1.2. Belle



fig.3.9. Belle's first appearance heading to the village's bookstore

Belle is the lead character of *Beauty and the Beast*. She is the heroine who represents beauty and is known in her village for being strange. Her 'strangeness' comes from being a dreamer. Belle is always reading and dreams of a life outside of her village, a

life with magic, love and adventure. The village is always busy with the frantic ‘provincial life’ and Belle dreams of something beyond that. We, as viewers, are able to reach these conclusions about her character early on in the first scene. Throughout this scene in the village we see a great amount of the secondary characters crossing paths with Belle. All of them are represented in approximate warm hues, blending in tones with the scenery. We can interpret this as a way to show that these characters can be seen as a collective character, the village. To contrast with these characters, Belle appears to us dressed in light blue, as the opposite to the earthy and warm tones of the scenery and secondary characters. Not only does she stand out this way in the collective shots, where she appears in the middle of the village crowd, but her colors also help to define her personality. The way she stands out for wearing a different color tells us that she is different from the rest. Also, the colors blue, which represents the sky, and white, which represents clouds, can be used to tell us that she is a dreamer, who has her ‘head in the clouds’ most of the times.



fig.3.10. Scene where we can witness the contrast between Belle and the villagers

Unlike the Beast, Belle is not mysterious. She is what you see from the start. Her evolution in the story occurs through her interaction with the Beast and doesn't change her personality. She is the one who will change his. This starts when Belle has to go searching for her father leaving her village behind. In the castle we see her expressing fear for the first time when she meets the Beast. This emotion is established by the desaturation of the colors and from the use of low values. In this scene she is seen in a traveling cloak of a dark blue color, which can convey heavier emotions, like sadness and fear.



fig.3.11. Belle's first sight of the Beast



fig.3.12. Belle stays as a prisoner

In her stay in the castle as a prisoner of the Beast, Belle passes through a few emotional changes that are represented through different mood settings. When she decides to disobey the one rule that the Beast gave her and ventures off to the west wing, the Beast goes mad at her and she runs off to the forest. Here, wolves attack Belle and her horse, and we can see in the lighting the desperation of the main character. She is portrayed again in de-saturated colors and her face is lit with bounce light⁵⁵ that seems to be coming from the moonlight hitting the snow. The light project shadows in darker tones, which ends up adding to the dramatic tone of the scene. The tones around her are more saturated and with dark blue and violet hues, which, through their contrast with the character, convey danger and panic.



fig.3.13/3.14. In this scene we can see the presence of highly saturated blues contrasting with the de-saturated skin tones. The colors are of dark values, to create more dramatic effect.

At this point, the Beast commits his first selfless act by saving Belle, and seeing that he has good in him, she starts to fall in love with him.

Later, when the Beast offers the library to Belle, she no longer feels fear or like a prisoner. She is starting to feel safer and at peace. We can establish that connection to

⁵⁵ light casted indirectly from the reflection of surfaces or objects.

her clothes in this scene (fig. 3.15). The predominant color is green, which in this case transmits a sense of calm and tranquility. Also, in the next scene where both characters interact in the gardens in a playful mood, Belle starts to realize that she likes the Beast. She is portrayed in light warm colors in contrast with the very dark tree in the background (fig. 3.16). The hues are predominantly reddish and pink, which symbolize love and passion. Even the small details, like her lips or blush color, give her tones of pink. Efforts were made in this scene to make it obvious her growing infatuation towards the Beast.



fig.3.15. Belle in green dress (calm)



fig.3.16. Belle in pink dress (love)

In the ballroom scene, Belle's character is seen glowing with happiness. She has found love in the Beast through adventure and magic. Her happiness is demonstrated by the radiant color gold of the dress she wears in this scene. With the yellow light coming from the candles, she displays warm colors in tones that transmit happiness and joy. These colors are highlighted by the contrasting dark blue background.



fig.3.17. To the right of this image we can see the warm and bright colors chosen to depict the happiness of the character. These colors are highlighted by the deep blue curtain in the back

Like the Beast, in the final scene, when the action reaches its peak, Belle is again represented in desaturated tones (fig. 3.18). In the final sequence she is worried about losing the Beast, and again this is reflected in the way she is characterized. She is wearing the dark blue cloak once more, which establishes a connection to the gloomy background and the overall seriousness of the environment. The Beast is tragically stabbed by Gaston, and ends up drawing its last breath as Belle proclaims her love to him. The two characters are shrouded in a bluish atmosphere as this represents the saddest moment in the development of the action. Finally, with the curse broken by Belle's love, all the dark tones are washed away as the two characters start their lives together joined with their loved ones (fig. 3.19).



fig.3.18. Belle confesses her love



fig.3.19. Ending scene – happy ending

3.1.2. Sets

Another visual element of major importance on visual storytelling is the setting. We could almost understand the emotions in the story just viewing the diverse sets used in this animated film. The color progression of the sets in this specific film is in perfect accordance with the action. When the story is livelier, the sets are full of bright warm colors and when the mood is scary or menacing, the sets are filled with cool and dark colors.

We are presented in the beginning with a scene with Belle's house at dawn. This is where we are first introduced to the main character and her village. Here the colors are predominantly warm and vibrant. In a certain way, they infuse the viewer with feelings of happiness and safeness.



fig.3.20. The warm range of colors chosen for this scene represent the village and its villagers

These colors symbolize the village and its villagers. As said before, in *Beauty and the Beast*, the villagers can be seen as a collective character and the same goes for the setting in which they live.

We are first introduced to the Beast's dark surroundings in a very subtle way. As Belle's father Maurice travels to a nearby village, to enter an inventions competition, he loses his way and gets lost. He ends up entering the forest where the Beast's castle lies. The color mood change between the village and the castle is done very progressively, giving the knowledge to the viewer that we are entering a dangerous place. It goes from warm earthy and pastel tones to dark blue tones.

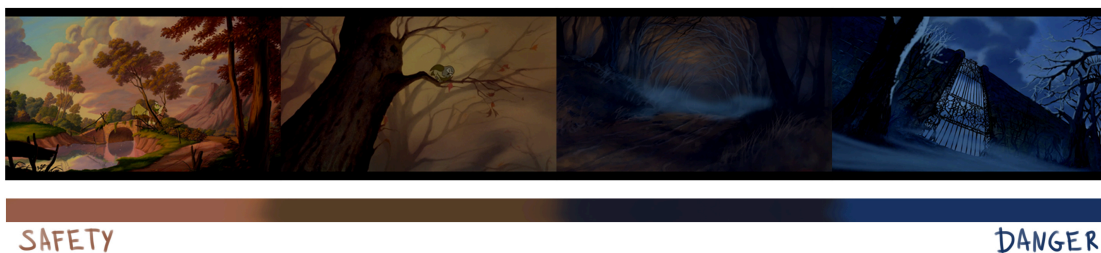


fig.3.21. Scheme of color progression of the father's journey to the Beast's castle

In the interior of the castle we face very dim lighting with dark blue colors. It shows a dangerous place with dark history but the blue gloomy tones make us also understand that there is some sadness there. The scale of the castle shows Maurice very small and the sounds of his echo help to enhance that feeling.



fig.3.22. Maurice entering the Beast's castle

When we return to the village, where Belle is, she sings of how she would like to live an adventure and get to know more outside the 'provincial life'. The set of the hill where she is, translates through its light and colors signs of hope and dream. The scale of it also depicts a vast world contrasting with her small size, symbolizing a vast world outside of the village.



fig.3.23. Scene where Belle sings about wanting more than the 'provincial life'

When Belle learns about her father's disappearance, she tries to find him. She ends up in the castle replacing her father as the Beast's prisoner. We see an effort of the Beast to try and make her feel at home but he sets just one rule, to never step into the West wing of the castle. Of course, being a courageous and adventurous character, Belle immediately disobeys and she goes in the West wing. This part of the castle is the part that physically represents the Beast. There is a deep symbolic meaning to all of its visual elements. The corridor leading to the room is very dark and with scary sculptures. The interior of the room is equally scary, with destroyed furniture, torn out paintings and curtains and other shattered and old objects that show us that who lives there is a troubled individual. But deep inside the room, at its center, lies a flower inside a glass radiating a light pink color. This is the flower that represents the curse of the Beast, and symbolically represents his life and interior. Very much like the room, the Beast looks scary and menacing in the outside but deep inside he has a warm and kind personality.



fig.3.24. Belle entering the West wing



fig.3.25. Interior of the forbidden room

When Belle is caught, the Beast reacts in such a way that she runs into the forest. She is attacked by wolves and saved by the Beast who gets hurt in the process. The following scene is the first one where there is some complicity between both characters, as Belle tries to clean the Beast's wounds. Here we see warm colors inside the castle for the first time, which are caused by the orange warm light coming from the fireplace. Fireplaces are visually attached to the thought of romance and we can get the same emotion from the deep red coming from the carpet.



fig.3.26. The vibrant red and yellow we see in the color choice for this scene represents imminent passion

As the Beast starts to fall in love with Belle, the castle starts getting more colorful and less dark. One of the most marking moments in which we can witness this is when he decides to surprise Belle and offers her the castle's library. The library is full of color in opposition to the other rooms that we have seen in the castle. There are no scary statues or destroyed objects. This room is the first evidence that the Beast is changing and it symbolizes his growing affection towards Belle.



fig.3.27. Interior of the library

As the story progresses and their love unfolds, the sets start getting brighter and livelier. The peak of their relationship is seen in the ball scene. In this scene the Beast prepares a romantic evening for Belle, which ends with a dance between both in the big ballroom. This ballroom represents the solidification of their love. We witnessed the colors surrounding these characters gradually getting warmer as they are getting to know each other but in the ball scene, the colors reach their peak of warmth and intensity. Everything is of a bright gold, from the set to Belle's dress and the Beast's vest. All the visual elements are giving evidence of their love and happiness at that moment. Even the sky, which is dark blue, is highly saturated and full of stars, symbolizing romance.



fig.3.28. Interior of the ballroom

After this scene Belle finds out her father is not well and the Beast frees her so that she can go to him. Belle is ambushed and Gaston along with the angry villagers attack the castle, trying to kill the Beast. When Belle finally gets to the castle she tries to help her former captive but Gaston manages to stab him in the back before falling to his death. As the Beast lies on the floor dying, Belle says that she loves him and the spell starts to break. As the spell is breaking there is a transition in the sets and general mood of the scene (fig. 3.29). The outside of the castle, that was of a dark blue full of gargoyles and dried up vines, suddenly starts to gain bright colors,

the gargoyles turn to beautiful statues and the vines become alive and full of flowers. These visual elements show us that the Beast's curse is broken. The colors in the new sets depict happiness, life and love. In the next and final scene, all the characters appear in the ballroom. This time, the set appears full of warm bright colors, representing emotions like love, peace and happiness (fig. 3.30).



fig.3.29. Scene of the curse breaking



fig.3.30. Final scene of the happy ending

As it was possible to observe, color and lighting play a major role in the visual storytelling of *Beauty and the Beast*. Throughout the movie, depending on the mood of the scene, we are confronted with different colors and different types of lighting that immediately evoke different ranges of emotions. This chapter was also important to solidify the study on color and emotion we did previously. Red was used to represent love and passion, yellow to represent joy and happiness and green for reliability. We also realized that concepts like color contrast can be used to enhance the properties of a certain color. For example, a bright yellow will produce more effect if it is shown against a deep blue background. This also shows us that the same color put together with other colors in different contexts will have different effects.

These conclusions were of great importance as we approached the stage of pre-production of our final project.

4. Project

For the final project in Computer Animation Masters degree, I was joined by my colleague Simão Carneiro, to bring an animated short story to life. We decided to join our strengths in this project so that each one of us could develop our separate skills. Simão was responsible for the animation while I was responsible for the visual development. Although each one of us was responsible of a different aspect of the project, we both ended up helping and intervening in each other's work.

Our short animation film is called 'Night Fright' and tells the story of an old man that wakes up one evening to a mysterious sound, which triggers a series of scary events. Although the story seems quite simple, it is the result of several attempts, brainstorming, trials and errors. This animation is the result of one year of hard work and we believe that if it had been half a year or even two years, the outcome would have been completely different.

4.1. Story

It is important to explain a little of how the story evolved throughout this last year in order to understand the evolution of all the visual development elements.

We began brainstorming for a story in the beginning of the summer. A lot of ideas were pitched but we seemed to favor the ones where one of the main character was a young boy. Since we both have a very active inner child, this seemed as a logic element in our story.

After some time we settled that we would like to create a short story about a boy and his grandfather. With that premise, we developed several stories, trying to find the right characters and right action for them.

We could almost separate the evolution of the animation into three categories. First we attempted a lighter and more comedic approach, second we tried something more in the dramatic area, and finally, we decided to try something with horror/comedy.

One of the first ideas was one where the grandfather was a man suffering from post-traumatic stress disorder.

The story focused on the day the grandfather had to babysit his grandson, fighting against his condition. Although we didn't develop it very deeply, this story became the foundation for a series of different ideas. We started going deeper into the characters, which consequently reshaped the story repeatedly.

We then decided to try a more dramatic approach and developed a little story where the grandfather was a very frail old man. He would try to play with his very active and innocent grandson in order to keep him happy and eventually die in the process. We gave up on this idea because we weren't connecting with the story and characters. We wanted something less dramatic and with some more humor.

The next idea was one where a boy dressed up as a vampire would try to scare his insane grandfather and provoke unexpected and funny reactions from him. We spent some time developing this idea, but it was in this process that we realized what was one of our major problems. We were trying to create a very short animation with a complex relationship between characters. We couldn't focus solely on the action because we were too worried about explaining the characters relationship to one another.

This is when we decided to strip everything down to its bare minimum. We took the insanity motif from the last idea, and we decided to make the grandfather the main character. This next story would be about an insane old man waking up to a mysterious sound in his living room. He would have a series of terrified reactions to this 'thing' that was approaching him that that ultimately would turn out to be his naughty grandson. This gave us the chance to work with horror and suspense, while getting some comedic reactions from the old man and from his fatalistic end.

This idea was the one that we followed through with the small addition of a twist in the end where we would hint that the crazy one might have been the child all along.

4.2. Visual Development

As the story evolved, so did the visual elements. We were constantly in the process of producing and designing visual concepts to fit the stories we were creating. From mood to the sets and characters, we were constantly redesigning them in order to fit their context. All the visual elements should be created in order to guide the viewer and tell him the story. We wanted the acting of the characters to be stripped down to the bare essentials and leave the rest of the storytelling to the visual elements.

The process in our own short animation was not a perfect one, but it was the best we could do with the knowledge that we had at the time. Ideas for the story were coming back and forth and so were the visual studies. It is hard to talk about the look development of a finalized animation without showing the studies that came before. Visual development starts in the very beginning of the pre-production and affects all the visual elements in the animation, from character and set design to mood setting.

For the sake of this study, we will separate each visual development topic into two different stages: pre-production and production.

The pre-production will be about all the studies and intentions made to reach the final outcome and the production phase will be about the process of bringing that final outcome to life.

4.2.1. Characters

Although this dissertation focuses mainly on the importance of color and light in the process of visual development, character design is also a very important element of this process. Character design is more than drawing anatomy. It is the art of drawing a subject with a certain mood and personality into a given reality. Unlike in live action films that aim towards realism, in animation, character design is about the creation of characters that match the reality that is being created.

In our project we wanted the design of the characters to also be a part of the storytelling. We wanted the viewer to look at the character and immediately

understand some of its characteristics and personality and also to almost predict their actions.

Our two characters were from the start an old man and a little boy. At first, we started to think of the boy as the main character but as time passed, the grandfather started to slowly take charge of that position. Although they have different levels of participation in the story, we wanted to develop them as equally as possible. Since they are grandfather and grandson, we also designed them in a way that it would be possible to recognize some common features between them.

- Old man

Pre-production

As we started thinking of the grandfather in the pre-production stage, we started looking for a general shape that would identify with the character we had in mind. By this time, we were searching for a grandfather that would fit the description of an old man suffering from PTSD. We used all kinds of shapes to understand which ones would be more identifiable with our character.

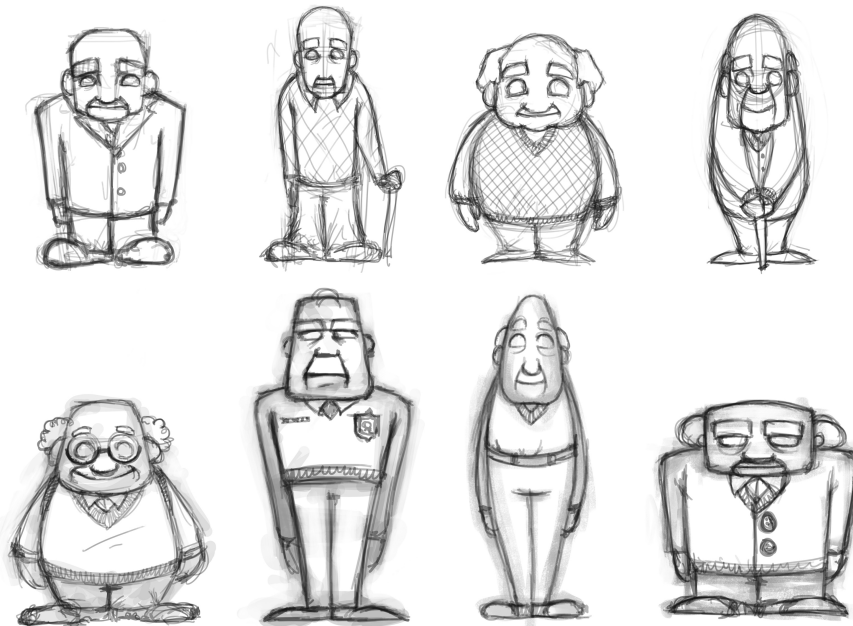


fig.4.1. First studies of the general design for the old man

Since we wanted him to look kind and sweet at first glance, we decided to develop one of the designs a little further into one showing those characteristics. The old man had roundish features that portrayed his sweet side and big eyes that showed kindness. His clothes were designed to show him as a neat and conservative man, while the colors light blue and pastel brown were to relate to his soft personality.

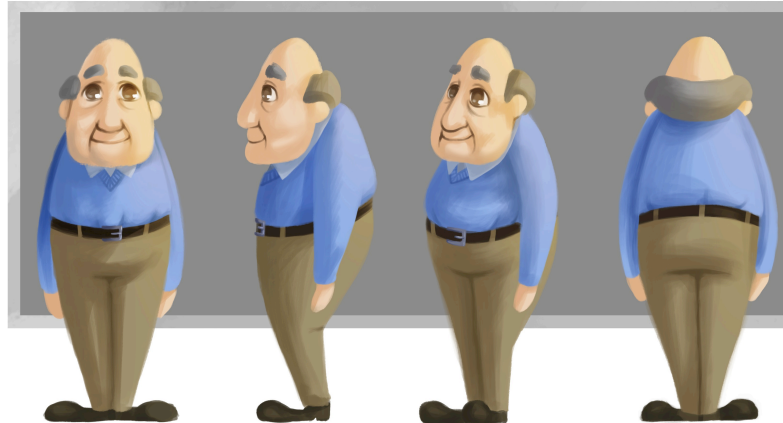


fig.4.2. Turnaround of one of the selected designs

After these first tests we decided to go in another direction with the character. Since the animation was evolving into something more dramatic, we decided to test other designs that would show a more frail side to the old man. We wanted him to look older but still maintain a playful look in his eyes and expressions.

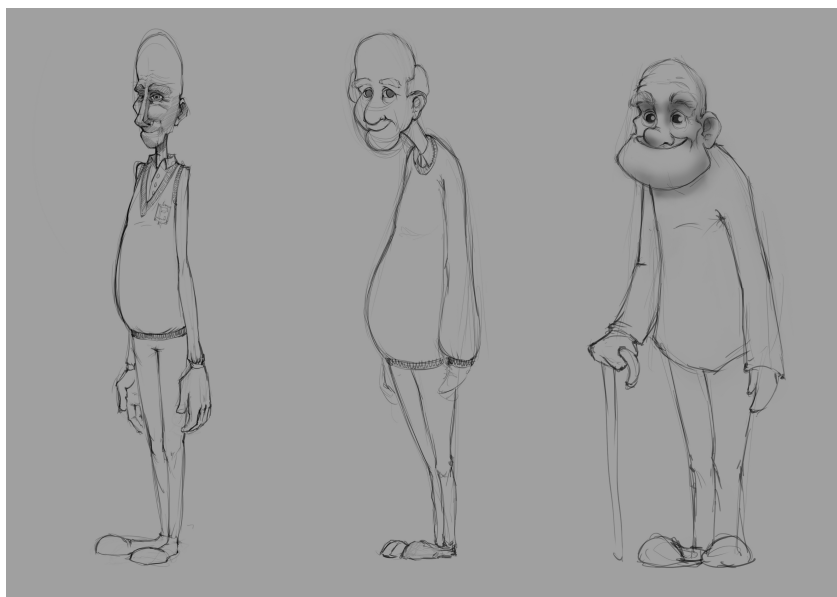


fig.4.3. Studies for the old man character

We started working more and more on the personality of the character and soon he started evolving into an insane old man with double personality: a sweet one and a crazy one. So we started searching for a design suited for this complex old man. It was not very easy because it was the same as finding two characters that would fit into one.

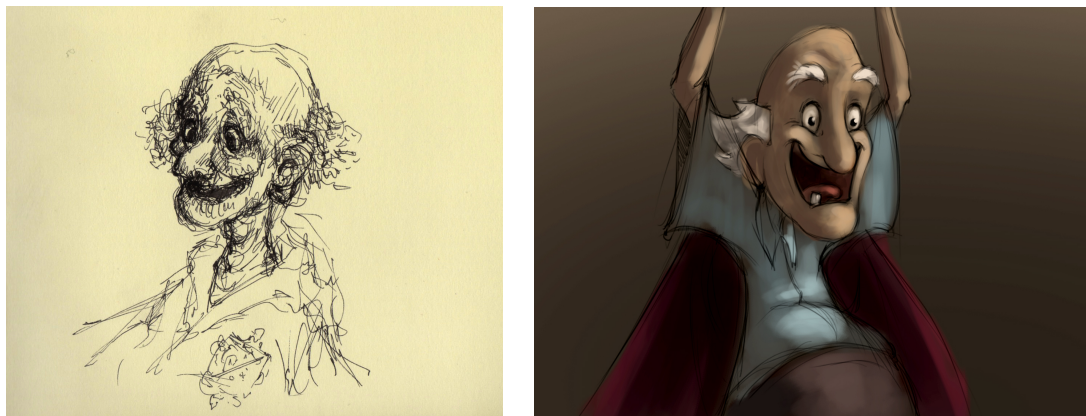
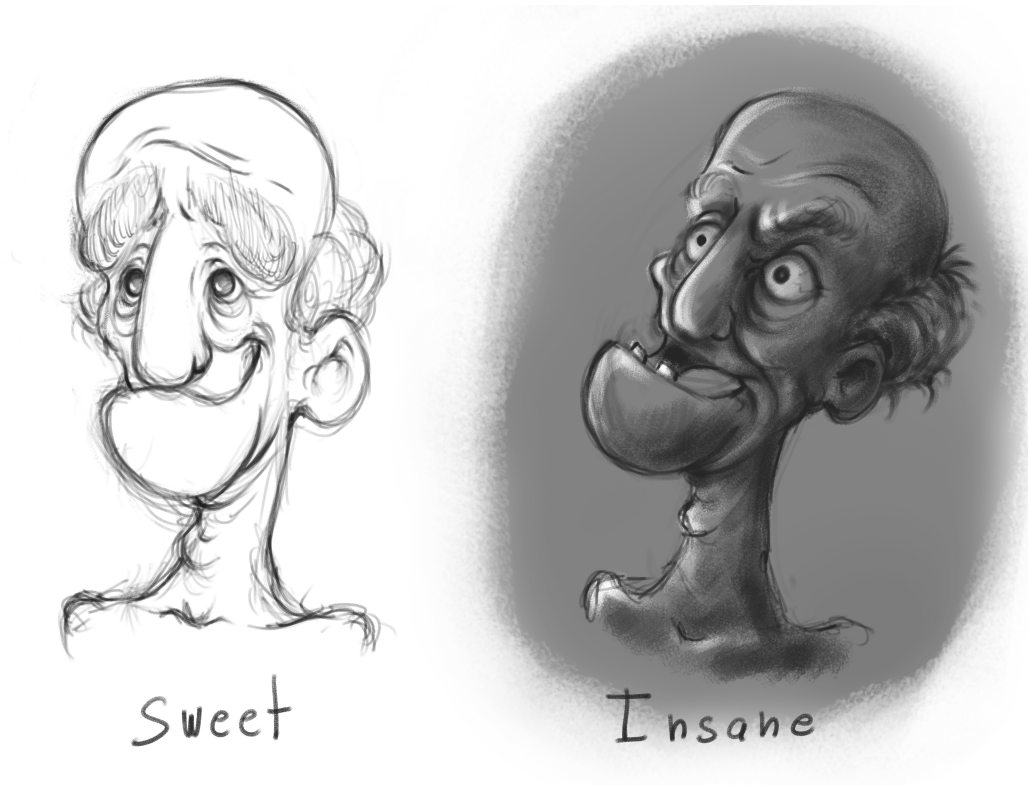


fig.4.4. Multiple sketches for the crazy version of the old man

We felt that we were getting nearer to our desired character but we still were not there. The crazy grandfather was a little too overpowering for the story and quite complicated in regard to the animation. We then simplified the concept of the story

and of the grandfather to a scared old man. This was the ideal for our character because we could maintain his sweetness and still have add some crazy characteristics to him.

We started adapting the design of the character we had and ended up with a final design, which we used to take into production (modeling, texturing and rigging).



fig.4.5. Final design for the old man's character

Production

We modeled the character altering some minor details, adjusting it more accordingly to its personality. He is an old man with a sweet personality, and that is noticeable through his features. His head, nose and chin are designed with circular shapes and so is his belly. The overall roundness evokes someone who is soft and sweet, or as Tom Bancroft, renowned character artist and author puts it: “Circles evoke appealing, good characters and are typically used to connote cute, cuddly, friendly types. Consider Santa Claus, or endearing, fuzzy animals.”⁵⁶



fig.4.6. 3D model of the old man's character

⁵⁶ Bancroft, T. (2006), p. 33

This old man is a person that enjoys to read for long hours and that is easily scared. His wrinkles and facial texture were studied and designed in order to give him a tired and scared look that would blend with the suspense environment that we were going for.

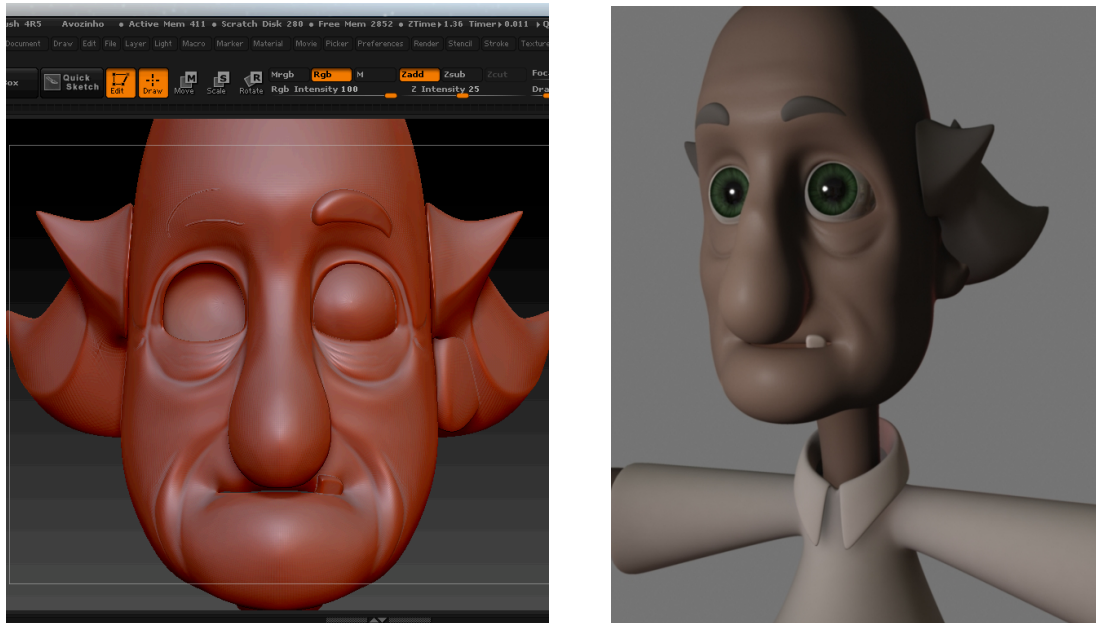


fig.4.7. Wrinkles studies for the old man

For the textures of his clothes we tried to use colors and materials that were somehow related to the background. For his pants we used the colors brown and beige. These colors are presented throughout the whole scenery (floor, table, old closets, couch, etc). The squared pattern selected for his pants is also a motif found in some visual elements of the set, like the chandelier and the blanket lying on the arm of the armchair. The texture and color of his pants represent his old age and the warmth of his personality.

For his shirt we selected a bluish white. This color makes the character stand out from all the background elements while providing him with a somewhat innocent look. Like we have seen in the color analyses of the Beauty and the Beast character Belle, white was used to make her stand out from all the villagers and background. The same was intended for our character of the old man.

The eyes of the character were designed to be big and bulgy. We wanted him to convey innocence and fear at the same time and the big eyes enhance these emotions. Again we wanted to stand out this element from the rest, so we decided to make his

eyes green. As we saw before, green relates to youth, and applied to the old man, it shows innocence. It is also a color that is barely present in the background and that made a nice contrast with the brown and blue tones.

For the hair and skin we created individual textures that would show the grandfather's advanced age. For the facial skin we made a texture to pronounce the wrinkles and deep bags beneath the eyes. We used colors not very high in saturation and value because we wanted the old man to look pale and tired. For the hair we adapted the image of a fiber texture with grey and white colors to resemble the hair of an old man.



fig.4.8. Image of the final result of the old man's face



fig.4.9. Face texture of the 3D model

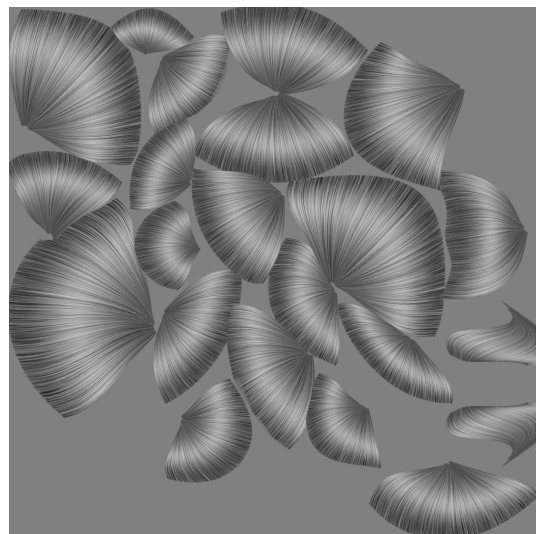


fig.4.10. Hair texture of the 3D model

- Little boy

Pre-production

Like the character of the old man, the boy's character also suffered some changes in the pre-production phase. As we began thinking about this character, he was supposed to be the main character but some circumstances made it happen differently. Unlike the grandfather, this character did not oscillate so much regarding his personality. We started out by thinking of a playful and sweet boy and only towards the very end did that change.

In the beginning the boy was supposed to be very young and he would try to play with his grandfathers war memorabilia, triggering his PTSD. We designed him with circular shapes and vibrant colors, corresponding to his personality.



fig.4.11. Initial design study of the boy's character



fig.4.12. Turnaround study of the boy

When the story evolved into a more dramatic approach this character did not change much its personality. He was still supposed to be a very active young boy, always trying to play with his grandfather. Regardless, we decided to try some more studies of this type of character with a similar design.



fig.4.13. Studies of the boy's character

After this attempt, we tried to create a young boy to contrast with the crazy grandfather. He had to be innocent and he had to look very scared of his grandfather's insane faces. Since we wanted the house to look big and old, we decided that it would make sense for the child to be dressed as a small rich kid, from a wealthy family. We came up with a few designs exploring these possibilities.



fig.4.14. Several studies for a new approach of the grandson's character

We proceeded with the development of one of the characters and we produced some studies of his expressions. We wanted to create a range of emotions in one character that would contain fear, scare, suspicion, happiness and sadness.

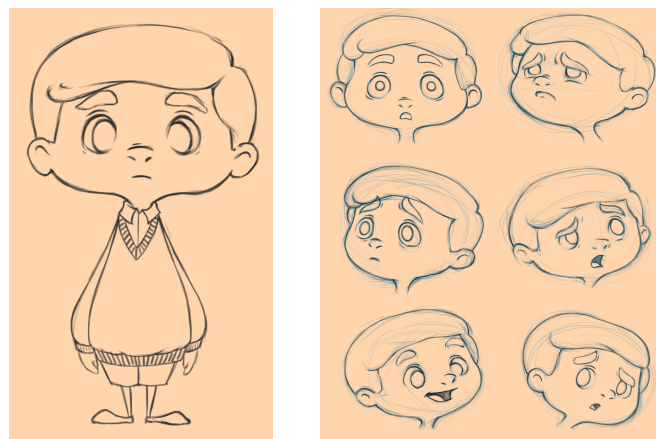


fig.4.15. Studies for the expressions of one of the designs

At last, when we decided for the scarier/horror approach, we tried to develop a boy that loved to scare. He would be someone that loves to see other people getting scared by his shenanigans but that nonetheless has some good within. After some studies, this was the character that we selected and that we used in the production phase. He possesses the same roundish features than his grandfather but he has spiky shaggy hair to show his mischievous and provocative side.

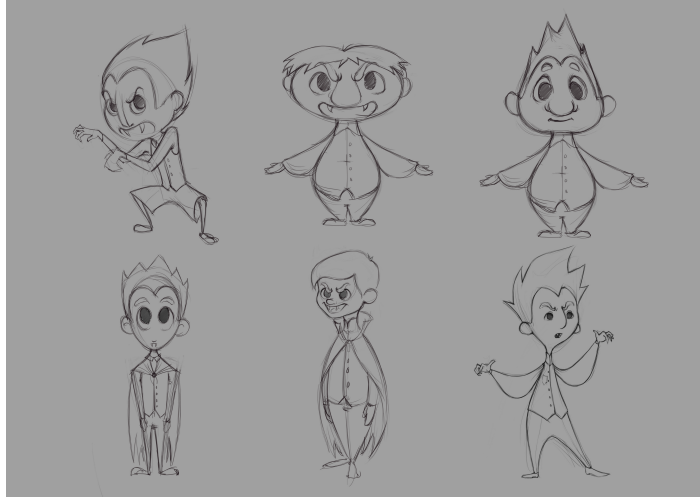


fig.4.16. Some more studies of the boy's character



fig.4.17. Final design of the boy's character

Production

A similar process occurred as when we modeled the grandfather. As we started modeling this character, we decided to make a few changes, like some corrections in his anatomy and trying to make him a little younger than in the drawings. We achieved this by making his head bigger, his body a little smaller and by rounding of his cheeks and eyes.



fig.4.18. 3D model of the boy's character

It was not necessary to create volumetric textures for the young boy's face (in the old man we created wrinkles and crevices) since the smoothed look suited him. This character only appeared at the very end of the short animation so we decided not to invest in too complex textures for his face or clothes. We made his eyes the same way as his grandfathers to show some more common features between both.

Regarding the colors, once again we chose them considering the set and also his opposing character. We wanted him to be a bit of the opposite of his grandfather's personality, so instead of worn out textures and colors, we decided to give him a red vest and a cape with a vivid purple interior. These vibrant colors contrast a lot with the overall color scheme in the rest of the film. Also, like we have seen previously in the color and emotion analyses, the color red can be the symbol for evil and danger, and that is one of the sides of the young boy's personality.



fig.4.19. Image of the final result of the boy's character

4.2.2. Sets

‘The setting is an important storytelling element. Setting and props can influence a character’s actions or support a story point.’⁵⁷

From the beginning of the project, we decided that we wanted the story to take place in an old living room. This would be the grandfather’s place, so we wanted this space to characterize the old man and to tell the viewer things about him and his background.

Pre-production

We first started developing the living room as a dusty old place, characterized by its infinity of old and dusty objects. There would be only one big window, marking the old man’s favorite resting area. This area would have a single old armchair and a little table with an old lamp that meant to show the viewer that this was where he rested alone and read his books. The old man’s character was a lonely secluded individual that loved his privacy and solitude, so the room was designed to show that.

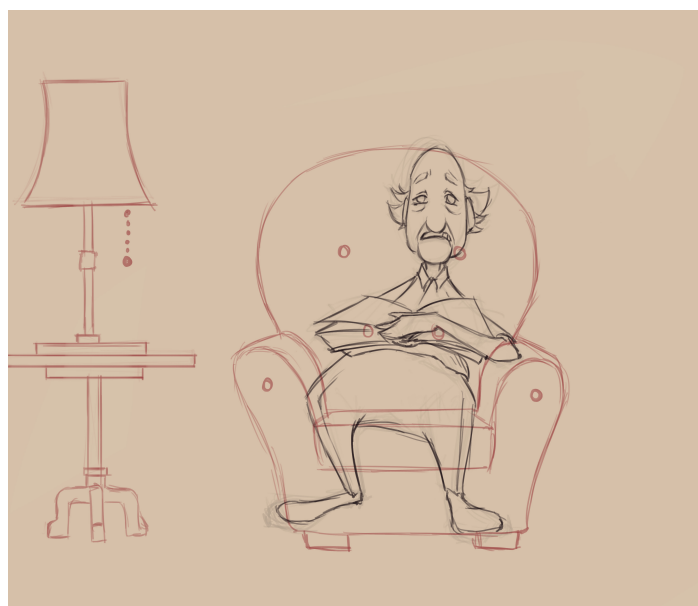


fig.4.20. Sketch of the old man sitting in his chair

⁵⁷ Beiman, N, (2007), p.103

As the story became darker and more about the terror, we decided to turn this room more into a place of suspense and mystery. We reviewed the scale turning the room much bigger, the window much higher, and enlarging the furniture. This would enhance the feeling that the old man is alone and small in the middle of a very big and scary room.



fig.4.21. Early study of the interior of the living room

The studies for the design of the elements in the set were produced in the concept art so we passed to the production phase as soon as possible.

Production

We started to block in all of the 3D elements and displaying them in the living room. At first we only used simplified objects and compare them with the scale of the characters to get a feel of the general reading of the room. After that we began by detailing some of the more important elements of the set, like the window and the chair.



fig.4.22. 3D layout of the interior of the room



fig.4.23. 3D model of the armchair

We then modeled and detailed the rest of the elements and tried out several textures in order to maintain the visual look we were aiming for. As we were texturing and choosing the colors for every element, we put them together with the characters to see if it was working all together.



fig.4.24. Comparison of the proportions between furniture and characters

We paid close attention to the closets because we wanted them to have an old look but still in an animation style. We didn't want them to be too realistic. The final result was a stylized digital painted texture that resembled real furniture.



fig.4.25. 3D layout of the textured closets

Some other smaller elements were added to the set to give hints about the personality of the old man. We created a great variety of books that would show the grandfather's taste for horror stories and a tea set on which there could be seen an image of

Frankenstein. These elements were also made to give the room a messy look belonging to someone who is always inside reading. All of the objects in this room had a role in the storytelling.



fig.4.26. Final result of some of the textured books

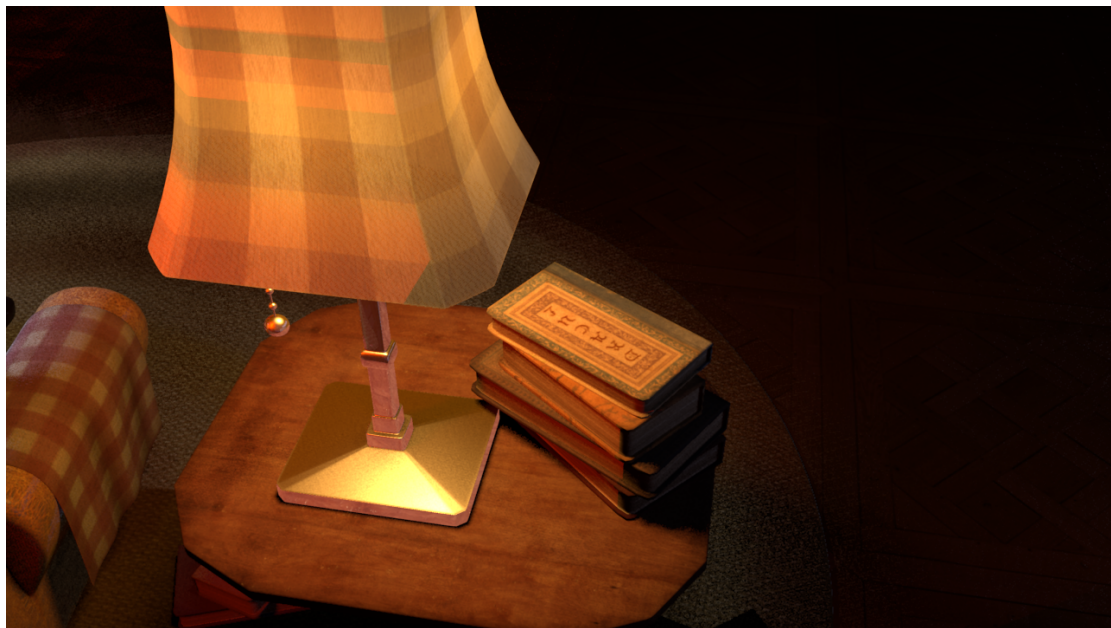


fig.4.27. Image test for the lamp and books on the table



fig.4.28. Final result of the old man in the middle of the cluttered living room

4.2.3. Mood/Environment

Mood achievement is something that we get from the gather of all the visual elements. It is the way that these are put together that will translate into one or more emotions. The mood of a scene is one of the most important visual elements in the way the viewer is guided through storytelling. Concept art is the most common exercise for producing mood studies.

Pre-production

The visual development of our short animated movie was in a constant process of change and evolution. At first, while the story was heading towards a more comic approach, our choice of style, environment and color was of a warmer, lighter tone. When the story started to evolve into something scarier, we started to approach cooler and darker colors.

“Mystery, suspense, and horror films work well with dark and dull colors, high

contrast long and dark shadows, mood lighting, fairly realistic characters, and perhaps a bit of inclement weather (...)"⁵⁸

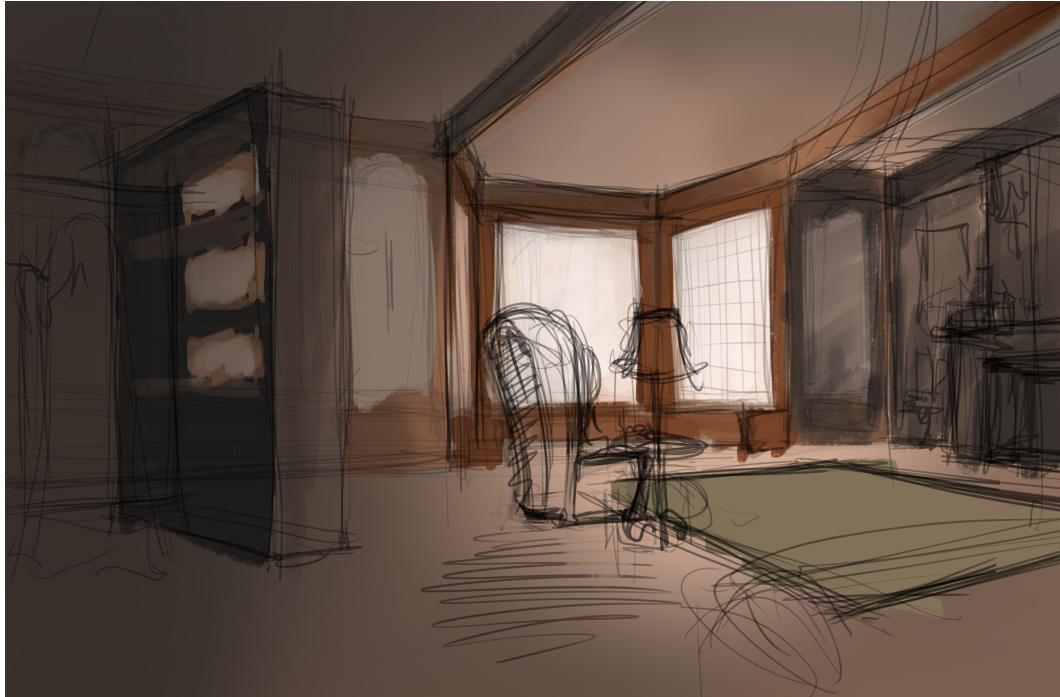


fig.4.29. Early mood concept study



fig.4.30. One of the final concept studies

The environment selected for the stage of our story was a dusty and mysterious old room with very dim light. From the beginning we had the idea of a very big window

⁵⁸ Cantor, J., Valencia, P, (2004), p.98

being the only light source for this space. This would create a lighter area where the main action would occur, leaving the rest of the room dark and obscure.

We started with small black and white sketches trying to define what kind of lighting and general mood we would like to create.

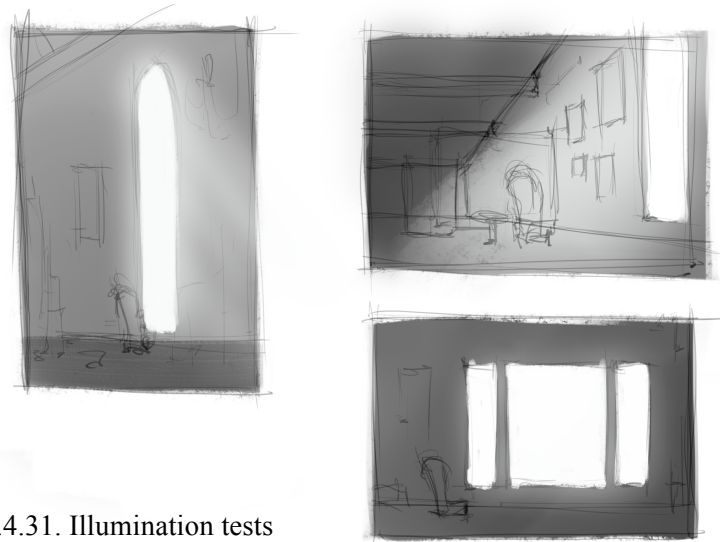


fig.4.31. Illumination tests

The lighting from the window would mark the main action space. At first, based on the analysis we made in the chapter of lighting regarding form/composition, we wanted this area to frame the spot where grandson and grandfather would meet. At this stage, the grandfather would be mysterious and crazy, so we wanted the general environment to reflect that. The armchair in which he would be sitting would stay in the dark, keeping the mystery and suspense until the moment they would confront each other.



fig.4.32. Dark/suspense mood concept study



fig.4.33. Another dark/suspense mood concept study

When the story became a more comedic approach about the little boy trying to scare his grandfather, we produced some studies of him coming out from the shadows into the light, trying to scare the old man. In these attempts, we tried to maintain the suspense atmosphere but with a softer approach. We experimented with volumetric light coming in from the window. This would add to the suspense feeling and would create cutout shadows, adding to the dramatic feeling.

In this concept we wanted the grandfather to be seen from the beginning, so that we could observe his reactions while the grandson would be the mysterious one coming from the shadows.



fig.4.34. Concept study of the first encounter of the characters

Finally, when we decided to go with the short version of the grandfather getting scared we tried to develop a sequence of environment studies of the boy approaching him. In these we pondered about having another light source coming from the door, where the boy would come from.

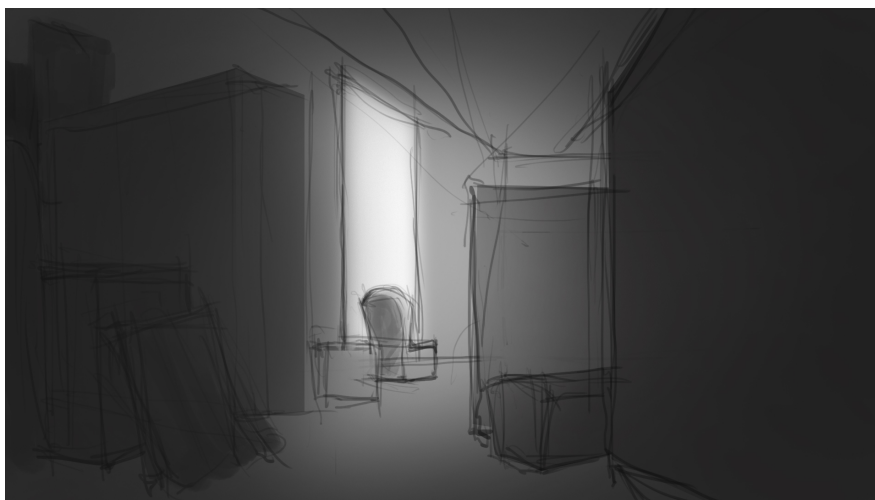


fig.4.35. Several value studies for a suspense mood

Later we decided not to show the sequence of the boy approaching and making it more mysterious until the very end.

We made a few more digital studies where we pondered about the use of color in this environment. Based on the color studies from the previous chapters, we were deciding if we wanted to try to create a deep dark red, symbolizing danger and panic, or a dark blue, showing stillness and fear. Since it was already past the appropriate time to begin the production phase, we decided to proceed with the last concept created (blue) into production. We would then try to find a way of visually inserting the element of danger (red) into the film.

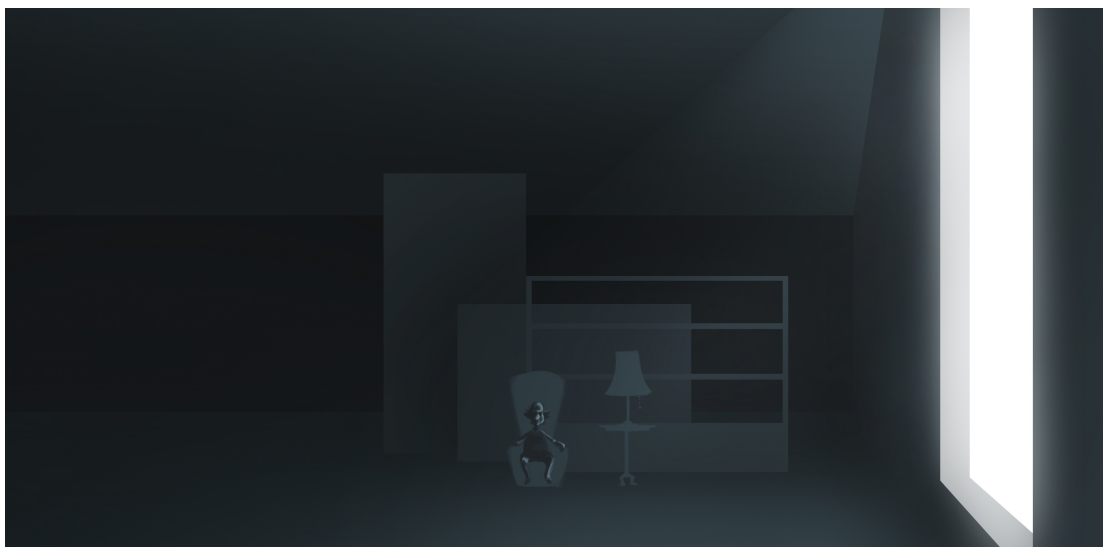
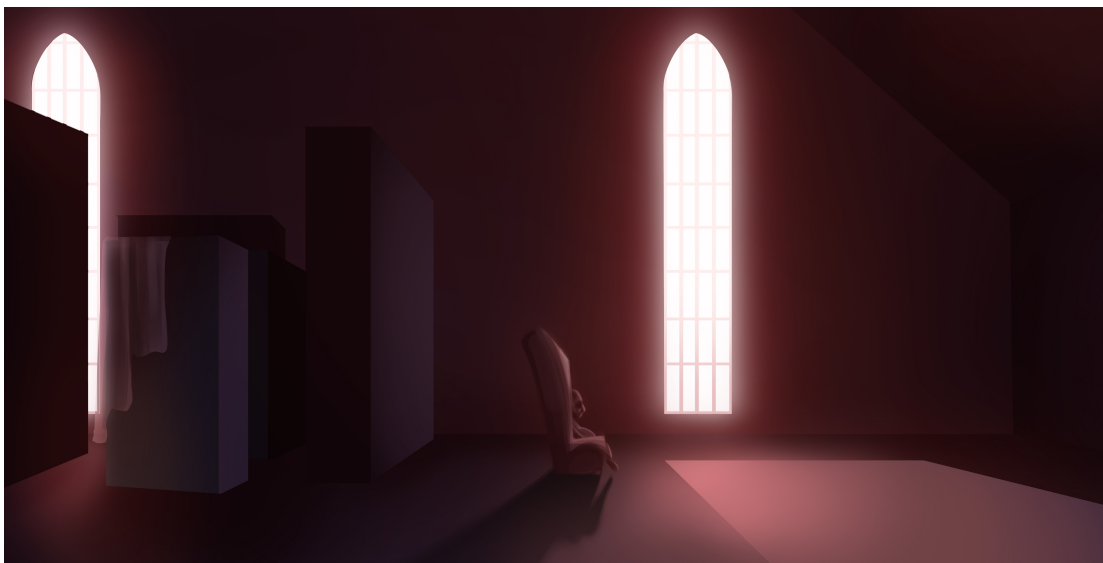


fig.4.36. Final concept studies

Production

In the production phase, after we had roughed out the modeling of the physical elements, we started to try and reproduce the lighting setup we had created in the digital studies. We began by reproducing daylight and a hint of volumetric light entering the room, showing that this was a dusty space. Although we really appreciated the effect that the volumetric light gave to the illumination, it was an element that would take a lot of time to produce in the 3D software we were using, so we had to give it up.



fig.4.37. Early layout and illumination of the set

After we defined some of the main textures for the set, we decided to develop the lighting of the scenery a little further. We tried to compare what would be more beneficial to the general mood of the animation, late afternoon sunlight or night moonlight. After testing out both ideas, moonlight seemed to be the best choice to create the atmosphere we were aiming for.



fig.4.38. Daylight illumination test



fig.4.39. Moonlight illumination test

When the general lighting and textures were settled, we went on to create the rest of the visual elements that would provoke mood changes throughout the scenes.

At the beginning of the animation we wanted to show an old man sleeping peacefully in his old armchair. This was supposed to give a false sense of stillness and tranquility, so we decided to keep everything as if it was lit only by the moonlight, resulting in general tones of blue. Remembering our analysis of color, blue can transmit a sense of quietness and peacefulness, while it can at the same time, hint at fear.



fig.4.40. Initial scene of the short animation

Since this is a story with a horror twist, we wanted early on to convey the idea of imminent danger. Based on the analysis of color and emotion we did previously, we decided to do that by inserting the presence of the color red. Throughout all of the animation this color symbolized the supposed evil approaching. We also used it as a means to frame the evil presence (at this stage nobody knew it was a boy) while it was approaching the old man. In this sense the viewer immediately understands that this light is intricately related to this ‘evil’ character.

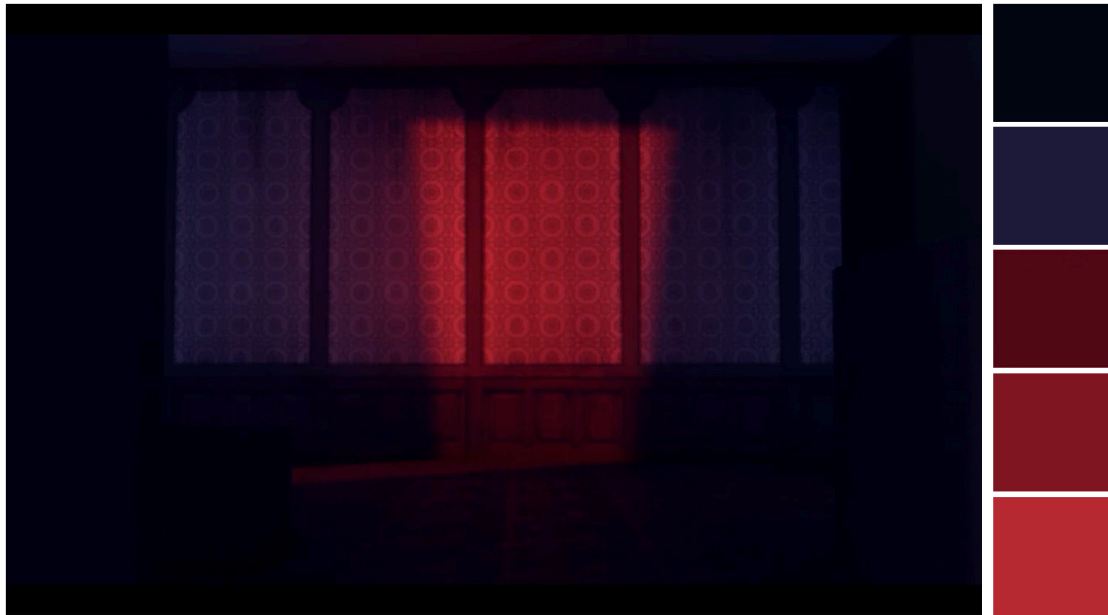


fig.4.41. Animation scene where we first see the red light coming from the door



fig.4.42. Animation scene where we can see the 'evil' presence framed by the red light

Another element that we wanted to take on a symbolic meaning in the visual storytelling was the light from the lamp. As the old man hears the presence in the room his reaction is to stretch out his arm and turn on the lamp. This lamp gives out a yellow light that illuminates the place where area where he is standing. It creates the feeling of a visually safe area. As we already saw, yellow can be interpreted as the

color for light and optimism, and the sudden presence of this light gives the viewer some comfort and a fleeting sense of safety regarding the character.



fig.4.43. Animation scene where the old man turns on the lamp

This light was also used for composition setup. The area that the yellow light reached reads as the area of the grandfather. It has a very powerful feel when it is put against the rest of the room. This light creates a great contrast between the bright yellow and the very dark blues around it. Only when it is seen from that perspective, does the viewer understand how unsafe the old man really is. A tiny yellow light represents him in a vastness of dark blues.



fig.4.44. Animation scene where the old man looks back

At a certain point in the animation, this false sense of security that the yellow light is suggesting is broken when the old man flips the table and the lamp falls. At this time the light, although having the same color and value as before, is now coming from the floor. This produces sinister looking shadows on the man's face, similar to the ones we saw on the Beast in fig.3.3. These shadows help to convey his fear and panic.



fig.4.45. Animation scene showing the frightened old man

Another visual element that was used with an intentionally symbolic meaning was the lightning. The lightning, which in reality is made using white lights that flood the room, has two purposes in the animation. One is to give out the sense of panic, as it makes everything more intense in aspects like color and emotion and the other is to frame the evil silhouette that approaches. As we wanted to hint at the possibility of the grandfather being crazy we decided that the boy's shadow would take it's own form as an evil distorted figure. This figure only appeared with the thunder, suggesting that it was the shadow of an evil monster. These shadows would be projected on the furniture as if they were framed.



fig.4.46. Animation scene with the thunder blast



fig.4.47. Animation scene where we can see the evil shadow projected on the closet

At the end of the animation, we created another visual element to help understand the final twist in the story. As the camera approaches the boy (and we understand that he is the old man that we heard in a therapy session in the beginning), the doctor says: “You must have felt terrible.”, to which the boy replies: “That’s the problem, I

didn't.”, implying his evilness. This part of the dialogue is actually not necessary, because in this scene we use the boy's expression and the change in the lighting to show that he is in fact evil. At the last moment we suddenly used the color red more intensely and we made use of the shadows coming from the light in the floor to give him a more obscure and sinister look.



fig.4.48. Animation scene where the boy changes from innocent to evil

5. Final Conclusions

As we began the research for this dissertation, the knowledge of Visual Development, its process and execution was very little. It was only possible to imagine the work that lay behind an animated film in order to obtain its visual aesthetics.

It is possible to affirm that after this study, there is a much better understanding of the subject. In every scene of a film there is complex work that has to be done to provide appeal to every single frame. From the study of form, to the use of color and light attributes, every element has to be thought out in order to obtain the final result.

There was a deepening of the knowledge on Visual Development, and at the same time, from constantly observing pre-production art, it was also possible to obtain some notions of how to apply these theories. We had the pleasure of analyzing the art behind various animated films, and to delve deeper into one of the most acclaimed films produced by the Disney Studios, *Beauty and the Beast*. It was possible to learn a lot from these films.

Finally, it was possible to apply this knowledge to the final project in Computer Animation. In the short animated film that was done with my colleague Simão Carneiro, we had the opportunity to explore a lot of the aspects of Visual Development. For our film, 'Night Fright', we had the chance to be able to study every single element, like characters, sets, props, color and lighting, since the phase of pre-production until the phase of its production. It was a very enriching experience. One of the biggest lessons learned during this process was the realization that every single element, like the tiniest prop, is there for a reason and it was studied and designed to appear as it does to the viewer. In animation every single detail is thought out and calculated in order to tell the story. Every aspect works in communion with the storytelling.

On a more critical note, there remains the wish that it would have been possible to have had more time in the pre-production phase. Some of the knowledge acquired in this dissertation came after the pre-production of the final project was already finished. In a way it would have been productive to spend more time trying to study each visual element more exhaustively.

This dissertation and the final project made it possible to understand, at a more personal level, that Visual Development is the field of animation which I am most passionate about. Regarding my professional future, I deeply hope to have the chance to work in this area again and to broaden my skills and knowledge on the subject.

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