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The Blanket: Play for social and creative development

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Burning Bright

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Abstract

In the depths of an old mountain, the forest has long lost its vitality. A brave young boy geared with

his sword and a mysterious bag, sets out on a journey to solve the mystery about the forest and save

this dying world. "Burning Bright" is a six minute 3D animation short mixing with hand-drawn flair.

The total production time is about one year and three months. The following thesis report describes

the technical and artistic process of making the film.

Contents

Thesis report

This is a six and half minute animation project created mainly in 3D Maya. Fifty-three shots, two characters and several sets were contained in the film.

The story is a tale of a boy and a monster with a backdrop of a land which has long lost it's vitality. Here, trees don't grow, flowers don't blossom, and forests are in a state of perpetual gray and silence. On a dark and silent night, a brave boy, with his sword and a mysterious bag, encountered a frightening dark monster. The boy was scared, yet he didn't intend to kill the monster. Instead, he brought his mysterious bag to it. Contained inside, was the missing power of the monster which then revitalized the monster. The monster, an incarnation of the forest, appreciates the boy's help, and uses its power to reignite the vitality of the land and bring the forest back into bloom.

With a background in traditional painting, I wanted to put my focus on exploring the significance of color and lighting in motion pictures, and also introduce a painterly style into modern 3D animation work. The film would combine 3D characters with 2D painting style background, foreground and effects to create a new visual experience to the audience.

Pre-production:

Story concept:

Action animation has long been a new form that I've been thinking of trying. "A brave boy's adventure" was the first idea that popped out in my mind. However, in order to give the story a more dramatic and unique touch, I veered away from the traditional "hero kill villain" cliché, and made the monster a positive character instead. I imaged it as creature with a frightening appearance and enormous power, but it's also the incarnation and guardian of this old forest. The boy thus saves the world by saving the monster.

My works usually have some natural and environmental concepts in it due to my interests in hiking and photography. These properties also apply to this project. The story is set in an ancient mountain, and one of the main characters, the monster, is the guardian of this natural world. The boy starts his journey searching for the key to save the deteriorating nature.

The other concept of this story is the subjective nature of perception, depending on the observer. In other words, one cannot judge things just from their appearance. In the story, despite the frightening appearance of the monster and its ability to breathe fire, it is not evil. Further more, although fire has an ability to burn out and destroy, it also paves the way to spawn a new cycle of life.

Story development:

Storyboarding is an effective method for me to troubleshoot the timing and rhythm of the story. When I tried storyboarding my original treatment, it turned out to be too long. Although it contains all of the details of the story and the background descriptions to convey my concepts, however, the first rough storyboards based on the original storyline were over a hundred shots which would have produced a twenty-minute animation instead of five minutes. Obviously, it was not be practical to do it.

Therefore, I trimmed and re-board the story during the summer. I talked with my committee, Skip Battaglia, Ferris Webby, Johnny Robinson, and several my friends to synthesize what is most important parts of my concept. At the end of summer, I decided to eliminate all of the background description of the monster, and start telling the story right in the middle of the tale. It seemed a bold action trimming the story, but in the end it worked surprisingly well. Basically, I rewrote my script to focus on the interaction between the boy and the monster, and told the story from the boy's point of view. The story is more focused on developing the sequence of the encounters between the boy and monster.

The new shortened version of the story is about four to five minute a more appropriate size for this project. Unfortunately, the short one was missing some of my deeper concepts, especially for the monster. Nevertheless, my original script still made a big contribution to my character and animation visual design because the character of boy and monster were already well-developed.

The following are my original script and the refined version:

In the deep of the forest, a strong yet young boy gears with a huge sword, walking in the dark mountain. The boy has brown skin with a tattoo on his face. He easily weaves through the dark woods. He had a mission-- to search for a monster sleeping in the deep of the forest…..

Hundred years before, in a small mountain village, there was a fierce war between the human villagers and a monster. The monster was so powerful and strong, breathing fire from its mouth. Afraid, the humans gathered all of the strong villagers to fight with it. In the end, humans won the battle. They took out monster's eyes, the source of its power, and latched it into a stone. They sealed it in the deep of the forest where no one would visit.

Years later, the villagers noticed that there was something wrong with their land. Trees stopped growing, the flowers stopped blooming, the nature has lost its vitality. Finally, the villagers realized that the monster they sealed years ago is a god of nature. At this moment, a brave boy stepped out. He volunteered to find the god and bring it back.

In the deep of the forest, the boy stands in front of the god who has been sleeping here since the end of the war. The stone monster is about thirty feet high but it is covered by moss all over its body; Birds build their nests on its shoulder and butterfly flies around it. This is the only part of the woods that still retains its vital green and healthy nature.

When the boy places the eyeballs back into monster's eyes sockets, vivid colors returned to the monster's body. It had a bright fiery pattern, glazing and colorful. When the monster(god) awoke, it doesn't move or attack the boy, all it does is stares at the boy. At this moment, everything becomes silent, even the bird chirps and wind blow seems to disappear.

Suddenly, the monster breathes out fires toward the boy. The boy startles. However, that fire is not hot. It passes through the boy, hits the ground and spreads out the hill of the mountain. When the boy turns to look at the fire, he sees the fire go all over the hills. Then, the fire turns into beautiful orange flowers covering this land. The life of the land had been revived.

In a land has long lost its vitality, a strong yet young boy, with brown skin and a tattoo on his face, gears his sword and a mystery bag, and walks into dark of the mountain. He is searching for a monster sleeping in the deep forest…..

The monster is awakened by the sound created by the startled boy. The panicked monster is blindly attacking around and breathing out fire. Even though monster is so powerful and strong, the brave boy still rapidly weaves through the woods and uses his sword to chop down the trees around the monster. Then, he successfully traps the monster.

In this moment, the sun rises up and lights up the face of monster. The light suddenly reveals that the monster has no eye. The monster barely can move because it has been trapped. The boy opens his mystery bag and brings out two growing objects to the monster. These are the eyes of the monster, and also the source of its inner power.

When the boy returns the eyes to the monster, the mighty powers of the monster awaken. Its body color from dim gray turns into a bright fiery pattern. It breaks the trap and breathes out fire to the boy. The boy startles, but the fire doesn't hurt the boy. It spreads out the hill of the mountain, and then, turns into beautiful orange flowers and vivid green to grow up covering the hills. The life of the land had been revived.

Character design and stylization:

Monster design:

The concept of the monster is an incarnation of the god in the forests, thus it is imperative that the design of this character should not only employ elements of scary monster, but also elements of certain deities. To achieve this image, I referenced photos of various religious festival customs, from my own culture. Each custom is a representation of different deity, highly decorative while also having a slightly fearful design, which perfectly fit my need. This particular character, should not

merely be scary, but also carry a good a balance of intimidation and respect.

Due to technical restrictions, I avoided the idea of an amorphous and translucent character design, which is more abstract and might be a better presentation of an "incarnation of the nature". The next appropriate idea for monster design is a distorted composite of wild-animals images, such as s lion, tiger, and bear which have powerful, "kingly" traits. After a few sketches, I felt a lion and tiger also portrayed a feeling of violence. Instead, bear seems more humble and closer to the personality I'm looking for. Therefore, I combined element from bears and the religious festival customs for this character design.

The final design of the monster has huge body of a bear with powerful muscles and a small head with strong facial features inspired from the deities' masks. I designed the face to be perceived as more frightening because the character is misunderstood as a villain in the first half of the story, and it would be desirable for the face to convey this misunderstood fear to the audience.

As for the color design of this character, I created two versions of the color to visualize the monster with and without power. One version has a dark blue pattern, while its body looks dim and monochrome, representing the monster with its eyes and inner power lost. After monster regained its power, its body returns to its original look, bright red with a vivid fiery pattern. The fiery patterns give it a frightening appearance, while also providing a visual link between its appearance and the ability to breathe fire.

Boy design:

The concept of boy is brave, smart, and nimble. He has grown up in a small village in a mountain and got used to weaving through the forest. With those ideas, I designed the boy with elements from the Atayal (DaiYiaan) tribe, an aboriginal people living in the central mountainous regions of Taiwan. Life in this culture was hunting and foraging based. Their clothes were handmade waistcoats usually of white or red tones, while they also frequently carried a handmade dagger on their waist. Some males have square tattoos on the forehead and chin as a mark of bravery, which I also adapted to the

design of the boy's face.

Left: monster design

Center: monster color concept

Right: boy design

Set design:

The story stage is in a mountainous forest that has lost its vitality. The landscape is covered with brown dry foliage and naked trees with no leaves. In the night scenes, shinning dim lights on the curling branches creates a mysterious mood for the environment.

The withering land was designed on mainly in grey and pale blue. For a visually dramatic change, from dead to new bloom, I colored the revived world in vivid green and covered it with the orange flowers, creating an antithetical image of the gray-lifeless land.

The fire and flowers in the ending scene was inspired from a type of the tiger lily in Taiwan. This flower has a bright and vivid orange-red color which looks like burning fire. Every July, mountain farms on the east coast of Taiwan are covered with this type of flowers, which also becomes a popular seasonal tourist attraction every year. I was very impressed by the view of it and decided to design a similar scene.

Ending Scene in the film

A flower farm in Taiwan

Stylization:

To give the film a painterly look, I designed the film in a more stylized form. I applied some painting textures and brushes into the animation pictures to make it feel like entire story was drawn in an old book. This style gives the audience a feeling of reading a story from a thousand-year-old book made of rice paper, on which an illustrator used a brush to record an old folk tale. With a BFA in Ink

Painting, I was excited to put my techniques into this film. My plan is to create character models in 3D, then layering them with hand-drawn textures in the style of ink paint.

There were also some 2D backgrounds that would be created with the same method. To enrich the quality of the images, I combined various strokes and paper textures together to emulate the look of an old book illustration. I chose ink and a thin rice paper, instead of watercolor and the regular paper, because the ink's variation is more apparent than watercolor, while the rice paper creates an aged-look to the images. I think this nostalgic Asian touch would make the overall appearance of the production more interesting and refreshing than a seriously photo-real form

Storyboard:

Designing a fight sequence was more difficult then originally thought, since there are various types of fighting. I did some research for the fighting between the small character and the strong creature, and collected a few action chasing sequences. Based on my research, I also realized that rhythm and timing of the sequences are the most important keys to building up tension.

The storyboard screening in the end of October helped my storyboard development significantly. From the screening, I received feedback about the confusion that occurred from the monster's actions. Many people did not understand that the monster was blind from its actions, so it cased confusion when the audience saw the boy return the eyeballs to the monster. Thus, that feedback led me to add some actions to show the monster couldn't see the boy to attack him. Also, to make the story more clear, I also added some shots to strengthen the connection between the boy's mysterious bag (with the eyeballs inside) and the monster's face.

Technical Production plan

In order to combine 3D characters with the 2D backgrounds, my work flow was: I first drew a black-and-white detailed storyboard with simple lighting applied as a first rough guide. With this as a reference, I carefully planned out which elements I would create in 3D and which one would be

composited with flat images. After everything was planned out, I went on to 3D to create a layout (3D animatic) of the entire film. This layout served as a blueprint for the entire production process, as it contained all the details of timing, camera movement and, the final composition.

For the color schemes, I did lots of color and lighting tests before I started my CG production. I decided upon light sources during the early storyboarding process and I also drew the color concept boards for each shot for my CG lighting guides. Those boards helped me maintain the consistency of lighting as well as a good rhythm for the changing moods.

CG Production Process:

Most of the project was created in Maya, while some specialized software, such as Zbrush and HaedusUV, were also used for speeding up the production process. Sets and characters and other 3D elements were animated, shaded, and rendered in Maya. After all the images had been rendered, backgrounds and special effects were added on top of the rendered images in After Effects, a post-production and 2D animation editing software, to create my final film.

Modeling :

From the storyboards, I perceived that my characters' midground would be changing from shot to shot. Therefore, instead of modeling a huge 3D forest environment to cover every shot, I only created several trees and stones, and arranged them in the scene depending on the camera angle and the need for the composition. Then I left the background areas empty to be dealt with in the post-production.

I created the character models in Zbrush rather than Maya because Zbrush is a program that allowed me to create models similar to how I sculpt clay. Coming from a fine-arts background with sculpting experience, I felt more comfortable working within this interface. Zbrush is especially good for modeling organic elements. The Zsphere tool gave me a great ability to build irregularly shaped trees very quickly. The program also has many brushes that are useful for creating exquisite details such as tree bark and the monster's muscles. After I finished sculpting, I exported the clean, beautiful

retopologized models and their bump maps. Then, I imported them into Maya for further production processes.

Animation :

I distorted the bear's movements for my monster's animation because the monster shape was mostly inspired from bears. I did some planning sketches from the bears' reference video to examine how they attack, be startled, and threaten etc, before I moved to 3D animating.

The boy was more complicated than the monster. I imaged the boy's movement like a ninja: fast, lithe and nimble. Lots of unique running, jumping, and fighting movements are involved in the boy's animation. I searched for some films that showed superhuman like motions, but it was difficult to find clear references. With limited references, I animated the boy.

For the technical side of the process, I used a TSM auto-rig, a Maya plug-in, to rig my two main characters. In addition to the TSM rig, the boy's vest is controlled by extra joints I added on the top of it, so that I can animate the vest's movement and create the secondary motion for the character. I added several simple Blendshapes (a device to allow one to edit the deformation of the models) for the character's expression and hair. I chose not to use the nCloth (a tool to simulate the physics of clothes) as it was difficult to control the object and hence complicated.

The sword and tress are the physical objects in real world. However, in the cartoon world, these objects would deform and stretch when they are affected by the character's actions. I created a skeleton for the sword and the trees, so that I was able to animate them when they interacted with the subject.

After all the sequences were animated, the timing for the entire film was spot on; which allowed me to pass it to my composer to create the musical score. At the same time, I moved on to creating the color and art for my scenes.

Texturing :

To achieve my painterly style, most of my textures were hand-drawn. I used HeadousUV, which

is a program specially designed to unwrap the UVs of the models, to layout my characters' UVs. Then, I printed them out on large paper so that I could use them as a guide and drew on the top. I painted the textures in ink which is my Bachelor concentration. Instead of using color, I drew all of the textures in black-and-white because it's easier for me to scan, color and layer them in Photoshop. Once I finished, I applied those textures to my 3D models.

UV →   *Scan images*   *→ layer together*   *→ color in PS*   *→ final 3D models*
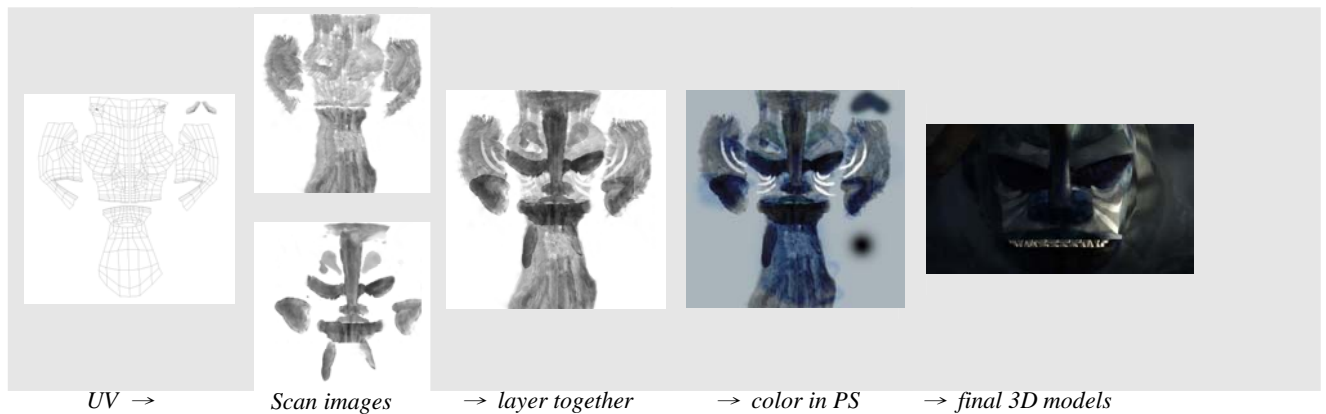
I used a sub surface scattering material, which is a skin material used to simulate the way light passes through skin, to create my monster and boy's shading. Although this material is more complicated to control, I decided to use it because I found that if I used the basic Maya Material, the skin color of the characters were inconsistent during the rendering, which created unwanted visual artifacts with in the characters. Although the texturing process was quiet time consuming, it stylized the film quite well and definitely became one of the outstanding points of this film.

Lighting :

The lighting not only adds illumination to the image, but also adds narrative. In this project, lights play a key role to guide the mood of the story. I manually set up the lights and animated each shot to ensure that they achieved the right atmosphere in the scenes

I painted lots of lighting concept art for atmosphere reference. I rendered the scene with flat material, no lighting, and painted over it in Photoshop to test the mood of the shots. I used those photoshop-images as guides when I was lighting my scenes in 3D Maya.

Scene with flat material   *mood test in Photoshop*   *final image in the film*

The story takes place from midnight to dawn. It follows the rising of the sun, gradually uncovering the truth, and then finally reaching a climax when the fire burns the land. With this idea in mind, I designed my color keys to gradually transition from dark blue to bright yellow-orange. The story begins on a shadowy, mysterious night. The color is blueish, with low saturation, high contrast, and the details are hidden by dark shadows. In this sequence, the boy is sneaking toward the monster and trying to trap it. To represent this tense and mysterious atmosphere, I created the light source from the full moon in the sky and mostly used rim lights to illustrate the characters. I left the characters' face and expression in low illumination so that I was able to hide the monster's face without showing that it has no eyes.

The sun rises in the middle of story. It fills the environment with a pale yellow and light purple-blue for an early morning color scheme. It lights up the mountain, expelling dark shadows, and it also reveals the fact that the monster has lost its eyes.

Usually a sunrise is associated with hope and joy, but not in this scene. The challenge here was to create a scene with a sunrise that shows nature is still and not vibrant with life. After some thought, I gave them the warmer lights compared to the bluish night sequence, but I kept the colors less saturated. To emphasize the sun light, I applied a "glow" effect to the specular highlights.

When the monster's fire burns life into the mountain, I changed the lighting to reflect the important of the scenes. Basically, I increased the saturation and added some vivid orange-yellow into the light colors to enhance the feeling of revival. I made the key lights bright orange to represent the sun and made the fill purplish blue to resemble the sky.


Color keys in the film: gradually transition from dark blue to bright yellow-orange.

Post- Production :

<u>Rendering & Compositing :</u>

In order to have more flexibility in the compositing stage, I rendered my scenes from Maya in separate passes. My idea was to output each element to different layers, so that I could modify the color, depth, exposure of each object individually. I also rendered the ambient occlusion passes which could be used for adding better detail to characters; the depth passes for creating depth of field in camera, the specular passes to emphasize the highlights in scenes…etc

With all of the passes ready, I imported them into After Effects for further compositing and matte painting. At the same time, I also finished drawing my backgrounds and effects elements. In this case, the tree in the background, the mountain, clouds, mist, and fire were created, animated, and composed into images during this stage.

3D passes render from Maya   *2D background & smoke*   *Final image*
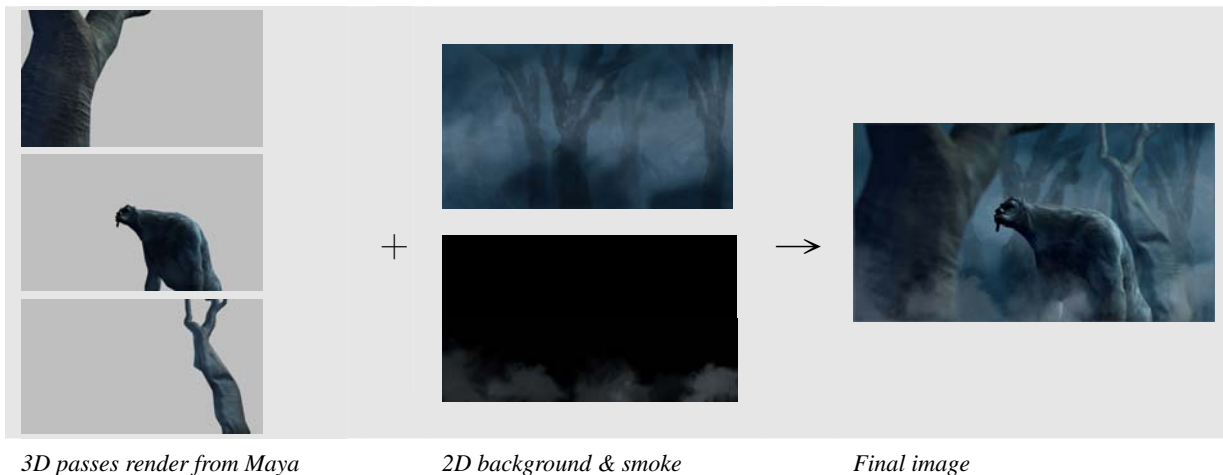
Camera depth-of-field and Motion blur were also added in this stage to reduce the render time. It was quiet easy to create the depth-of-field in After Effects because I already separated everything in different layers. I had the ability to control the focus for each element and achieve the depth effects I wanted.

Motion Blur is an effect that enhances the motion of the characters. Unfortunately, AE was only able to create a fake direction blur for the characters, without adding a sense of depth to it. Rendering characters with motion blur in 3D gives a more realistic effect, but unfortunately, that would have consumed too much time from my schedule. *:*

Because there was a technical challenge in making "the fire turn into flowers" in 3D, I decided to fake the shot as "the fire burning out flowers" in compositing. I used After Effects particle system with ink-brush texture applied for the fire. I duplicated and offset the timing for the flame to create lots of fires covering the field. I animated each of "flames" frame by frame to create 2D fire burning over the 3D hills. I also used the same technique for creating the rest of the fire in my film, but this is the most complex and critical shot in the film.

This ending shot is six hundred and twenty frames, about twenty-five seconds- a long camera take. The camera follows the fire as it burns and the flowers spring up in its path. Fields of flowers and flourishing grass caused serious technical issues. Two Maya fur systems(for the grasses) and three particle systems(for the flowers) were too heavy for the computers to render. Even when I greatly reduced the amount of flowers and grass, it still took Renderfarm a week to finish rendering those frames.

The lighting and composting process was more complicated than I thought. For example, on an average, one shot took me about one day to light, and another an entire day for compositing. I began my rendering process in early March, but this film still took me more than three months to finish. Afterwards, I was glad to see the all pieces come together. The 3D and 2D elements blended together perfectly, and it definitely enhanced the aesthetic of the film.

<u>Music and sound effects</u>

I don't have vast experience in sound design, so to collaborate with my music composer, Nickolas Kelly, and sound professor, Dave Sluberski for this project was a delight. They helped me to improve the quality of the audio and I also learned a lot about the power of sound design from them.

Nickolas Kelly was the composer for my Two Quarter project. Since I had good experience working with him, I decided to collaborate with him again. Now, he is a Masters student in Music composition at the University of British Columbia in Vancouver, Canada. Initially, I was worried about his music style because his previous piece was somber and slow. However, the score in this film

needed to be in the opposite style - strong, powerful and with lots of impact. When I received his first sample, my worries went away. He created a perfect score for the images, especially the transition during the fire turning into flowers. I felt I could sense the imagery just from hearing the score. His works really push the film to the next level.

My sound effects are from two free sound source web sites, Soundsnaps.com and Freesounds.org. After I collected the sound tracks, Heran Hao, a live-action student, helped me to modify the sound effects to match the characters and environment better. My advisor, Skip Battaglia, also advised me to use soft wind and paper-cracking sounds for the fire burning. He also suggested the bell sounds for the explosion. Those ideas were beyond my initial thoughts, but they worked well in the end.

I layered the sounds together and created the first rough cut of the sound effects. After that, sound Professor, Dave Sluberski, offered me a help on the audio post-production and lots of sound mixing. With everyone's assistances, the score and the sound effects came out very well.

Screening

Before the screening, I was worried about the reaction to my story because I cut lots of description and details from my original story during the pre-production process. However, the audience's reaction really surprised me. Several people thought that it was a well-developed, 'simple story'. Very few people noticed the missing details from the story. Overall I received very positive feedback for the film.

The aesthetic approach of the film seemed to be very successful. Ink paint created a very unique texture and style for the pictures. This probably is my most successful aspect of the film. The problems with the character model did not seem to bother the audiences. There were a few comments about the monster's animation. One particular feedback was that the monster's movements didn't have enough 'weight' to show his magnitude; and the monster's expression could have had more variation and improvement.

Conclusion:

Coming from a painting background, I'm thrilled to have had a chance to create this film and put my painting skills into a 3D animated world. I learned a lot from the entire process, not only the 3D technical skills, but also how to apply my hand-draw techniques to a digital creation.

I have worked on this project for about a year and three months. I spent most of the time developing visual forms and working on color and lighting in the film. I learned a lot form the production process about how to make texture, lighting and supplement each other to deliver quality results, and create the dramatic atmosphere to enhance the story. Then, most importantly, I had significant experience combining 3D characters with 2D elements and I enjoyed it very much. I'm satisfied with the final film, and appreciate everyone who helped me with this film. This experience gave me a new opportunity to exhibit my ideas, and also made me a better artist.

Appendix A--- Proposal

Appendix B--- Storyboard

Appendix C--- Color Stills