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Co co nut

Jiunnfu Su

Co Co Nut

By Jiunnfu Su

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Abstract: CoCo Nut

This paper is a companion to my thesis film, ***CoCo Nut.***

Thesis film is the third animation I made at RIT. From ***Position*** (one quarter film) to ***Noble*** (two quarter film), the core focus of my story moved from individuality to family; so for my third and last film at RIT, I wanted to make my country the core essence of my story.

The idea of my thesis film is about Taiwan, where I was born and raised. It is a story on the importance of cooperation. Due to our unique historical and political background, the two ruling parties of Taiwan, Kuomintang (the National Party) and Minjintang (the Democratic Progress Party) are constantly engaging in political struggles. Mutual checks and balances are common factors in a democratic society, however if the ideological disputes are inappropriately exploited, the opposing views are taken to the extreme and people's livelihood can only be negatively impacted as a result. This is what is happening in Taiwan right now. People of the same race and culture are split into opposing groups by ideological propagandas inspired by two parties. Disunity only results in degraded quality of life.

The two characters of my story, Kuo (blue) and Min (green), are shown chased by a sea monster to an island. To quench their thirst, they cooperate to fetch the last few coconuts left on the island. When both of them wanted to possess the biggest coconut, they begin a fight that almost results in their death—completely unaware that the sea monster is still lurking in the water, waiting to swallow them. At last, they realize that the only chance of survival is through collaboration. They relinquish their dispute, team up together, defeat the sea monster, break the coconut with the monster's teeth, and share the sweet coconut juice.

Through my animation, I wish to convey to my audience the simple idea that mutual tolerance and cooperation are vital for all of us sharing this tiny planet, particularly for those of us from Taiwan. It is only through mutual tolerance and co-effort can we make our tiny home a better place to live.

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Acknowledgements

I would like to thank RIT for giving me the opportunity to fulfill my childhood dream of becoming a CG animator. I also like to thank all the SoFA faculties and my classmates for their advices and support.

My special gratitude goes to my thesis committees, particularly to Professor Duane Palyka, my thesis chair. Professor Palyka offered me numerous helpful advices on story development and the visual style of my thesis. His comments and suggestions guided me through my doubts and confusions and made my film more appealing. I would also like to express my gratitude to Professor Thomas Gasek and Ferris Webby. As my committee members, they offered many invaluable suggestions and technical tips. Without their help, I would have never been able to achieve what I have today.

Last but not least, I would like to express my heart felt gratitude to my family, their support and encouragements accompanied me through all these years of hard work and made me strong in times of loneliness. I believe that the applause I received from my audiences would be the best reward for them.

Preproduction

Storyboarding and Animatic

Storyboarding is the most important process during preproduction. It translates the imagination of an artist and the words of a script into graphical representations that are in a similar form to the final product. It also helps the animator in thinking about how the story is to be told and what kinds of cuts or dissolve effects should take place. I tried to make my storyboards simple and easy to follow. As I kept working on the storyboards, I also realized that it helped me develop the basic style of graphics and the outline of my characters.

The whole story broke down to seventy two shots. All the shots from the storyboards are put together to make an animatic. This is a good opportunity to estimate the length of each shot and to gain an idea on how the whole story would be presented. The storyboards are also critical during the process of production as it guarantees that the essence of the story will be visualized and the various shots are connected.

Graphic Style

Due to the utilization of political metaphors in my story, several factors were taken into consideration during the initial design phase to achieve this effect. First of all, the main intended target audiences for the film are the people living in Taiwan. A film with a cartoonish and simple style will appeal to all generations. Personally I also like the notion that a film expressing meaningful ideas is paired with a simple story and design style. Secondly, as various colors represent specific political groups in Taiwan, I used bright, simple, and identifying colors as my color patterns to enhance this idea. Thirdly, as I wanted to emphasize character animation in my film, and since this is a one-man production, it would be very time consuming to create complex characters and scene sets that are comprised of high polygons and convoluted designs. Considering the technical aspects and the target audiences of my film, a cartoonish and simple look is decided as the final graphical style of this film.

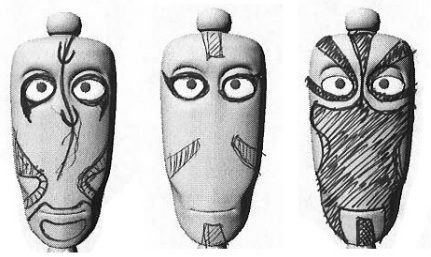
Character Design

There are three main characters in my story, two humans and one sea monster. Based on the theme of the film, in order to let the Taiwanese audience quickly and easily recognize the specific political group each character represents, the color of the characters was the first decision I had to make, being the most important metaphor in my film. For the figure designs of the characters, not only did I create different shapes for each character, but I also used drawings from Chinese opera masks as their facial features. These drawings contributed to my film in making it a more visually colorful, traditionally oriental, and expressively cultural piece.

: Kuo

Kuo is one of the two human characters who represents KMT (Kuomintang), the biggest political party in Taiwan. Because the color blue is the base color of KMT's flag, I decided to use blue as the main color for Kuo's whole body. He is a tall and thin character with big round eyes and ancient hairstyle. However, pure color without texture sometimes flattens a character making it visually dull for the audience. In this case, I decided to use the drawings of the Chinese opera mask on the faces for both characters. This not only made my characters more colorful but it also gave each character their individual personality. Through intensive research online in regards to the specific meaning of the drawings of each different mask, I made reference to some drawings that represented the characteristics of "**arrogance**" and "**leisure**", and designed a new mask with the colors of red and white for Kuo.

· Chinese Opera Mask
(Leisure)

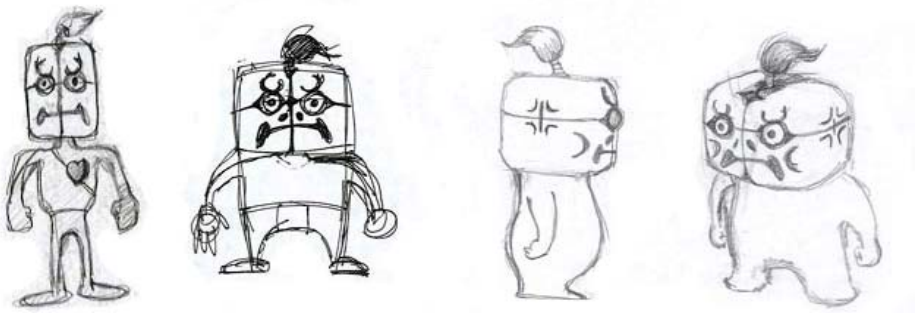


· Facial Texture Test
(Kuo)

· Sketch of Kuo

: Min

Min is the other human character in my story. He represents the second major party in Taiwan, DPP (Democratic Progressive Party). The base color of this character is green, the same as the color of DPP's flag. In order to distinguish Min from Kuo, Min is a short and chubby dwarf with a big rectangular head and a ponytail. Because Min is a bad-tempered character in the story, I made reference to some drawings of Chinese opera masks that represented the characteristics of "**loyalty**" and "**bad temper**", and designed a new mask with the colors of yellow, white, and black for Min.



· Sketch of Min

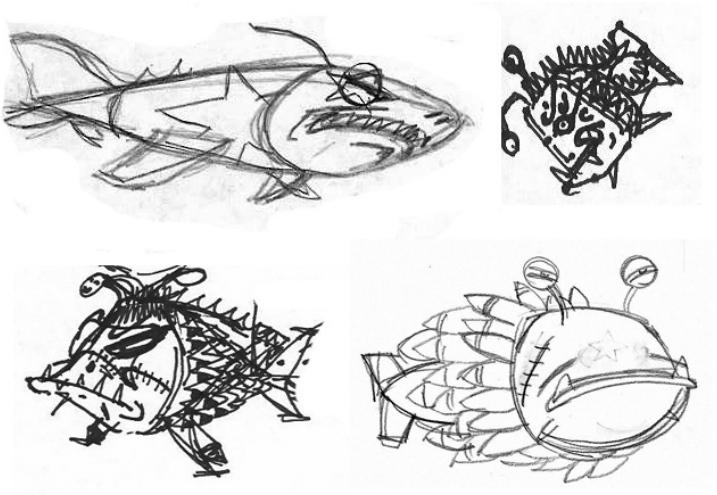
· Chinese Opera Mask
(Bad Temper)

· Facial Texture Test
(Min)

: Sea Monster

The sea monster represents the threats to Taiwan. The threat is not only representative of military forces but also the economy, culture, and political influences from abroad. To demonstrate this idea, the sea monster is weaseling and evil with a ghastly figure. To bring about these ideas visually, I referenced many monster characters from fairytales and comic books. I also used images of wild and distinguished sea creatures. In the end, I combined the different traits and features of sharks, angler fish, gorillas and Cyclops into the figure of the Sea Monster. Sharp shields and large teeth demonstrate fatalness and terror. I used the color red which represents danger and aggression as the base color of Sea Monster. At the same time, I referenced Chinese opera masks for the texture design. I chose the drawings of the masks with the meanings of **“weaseling”** and **“irritable”** and designed a new mask with the colors of yellow, black and white for the Sea Monster.

· Chinese Opera Mask
(Irritable)



· Sketch of Sea Monster

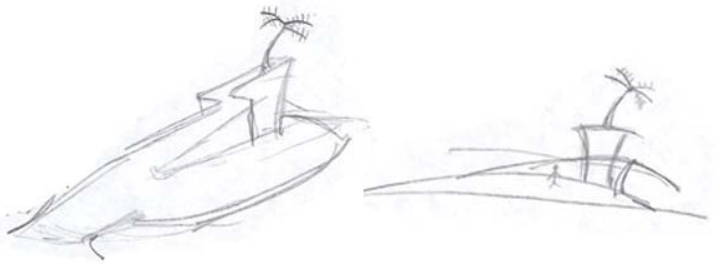
Scene Design

: Island and Ocean

My story occurs on an island in midst of vast ocean. Because the story is based on Taiwan, the shape of the island is designed to that of Taiwan. The island is made of high,

steep cliff with a flat top, and a flat beach. These two sets make up the stage for the story. I chose brown as the base color for the cliff because it is close to the natural color of rock in real life, at the same time, brown is a great color to bring out blue and green, the two colors that mark my two characters. Around the island is the calm and vast ocean. I set a simple scene better my audience in focusing on my characters and their interactions.

· Taiwan Map



· Sketch of the Island

: Palm Tree and Coconuts

I chose palm trees as the only vegetation on the island for two reasons: first, palm trees are commonly grown on tropical islands. It is tall and its fruits are difficult to reach, an idea that I wish to convey to my audience. Second, the juice of a coconut is sweet but its shell is hard to break. This helps to build up my story elements. In the scene, there are two coconut trees bearing a total of nine coconuts, one of which is bigger and brighter in color. This coconut becomes the seed that both characters struggle to possess.

: Lifeboat

The lifeboat carries the two characters to the island after ship wreckage. It is broken when the two eventually approach the beach. The broken pieces of the lifeboat and the red rope from the boat become what the two characters use to climb the cliff and eventually to catch the sea monster.

Production

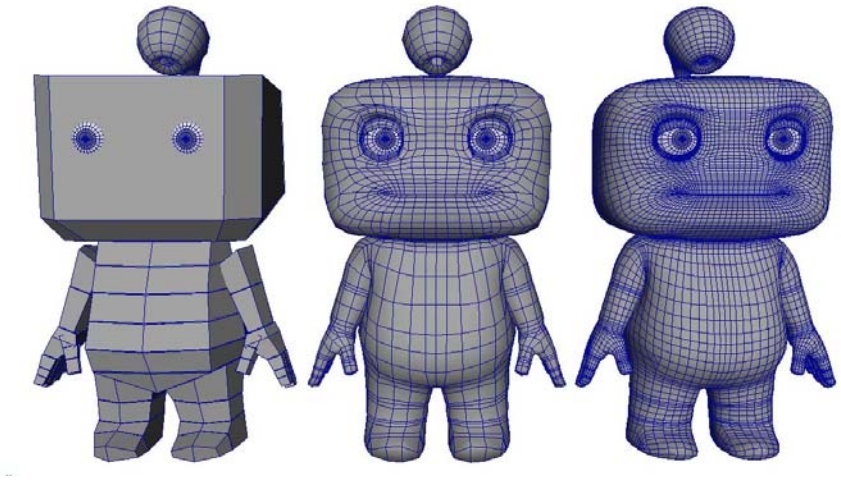
Production for *CoCo Nut* began in summer 2007 and took almost one year. This section would cover 3D modeling, texturing, rigging, the animation process, lighting and rendering. Tools that were utilized during the production period were Maya, Adobe Photoshop, and Adobe After Effects.

Modeling

My modeling included scene, props, and characters. I primarily used the method of polygon modeling. Scene modeling included the island itself. I modeled the island after the shape of Taiwan. At first I attempted to model it using Photoshop and Bryce, however, I later found that the island model produced by Bryce appeared to be too realistic, and not the cartoonish style I wanted. Therefore I decided to remodel the island using Maya. I used the split polygon tool to carve out the island model out of a single polygon geometry.

Props included the lifeboat, palm trees, coconuts, and a rope. I modeled all props but the rope with polygon. Because the rope required fine curvatures, it was modeled using Nurbs. I modeled two separate lifeboats, one complete and one broken.

Kuo and Min are my two main characters. Character modeling took most of my modeling time. I modeled three separate models for each character – low poly, high poly, and block. I used the low and block polygon models during my animating process, and switched to the high poly models for final rendering. I used the same base model for both of my characters, resulting in them having more or less the same poly faces. The sea monster was modeled last and was also modeled using polygon geometry. The scales of the monster were modeled with extruded polygons, and finally I added teeth and eyes to it.



· Block Model · Low Poly Model · High Poly Model

Texture Mapping

Texture is an important aspect of character modeling, especially in my film. A simple model with sufficient textures could deliver a stronger message than a complex model with poor textures. Since each character has a different personality and represents individual political metaphors, it is crucial to find the right texture for each of them. Before texturing, UV mapping is the first task to be done for each character's model as only the right UV mapping can reveal the accurate texture. I generated the UV layout images for each of the models in Maya, and then took them into Adobe Photoshop where I hand painted these maps. This was a very time consuming process and it took me about one month to finish. While I was working on textures, I used Chinese opera mask as the facial texture reference of characters. Every mask texture was composed of different shapes and proportions of illustration and color. After I finished the facial texture and met with Professor Palyka, he studied my characters and said to me: I know that your characters are designed to have no nose, but if there are some textures in the nose area, the characters would have more vivid expressions and look more convincing to the audience. I followed his advice, and indeed the characters looked more interesting than before. And I understood that all facial parts are essential in character animation.

· Color Map for Kuo

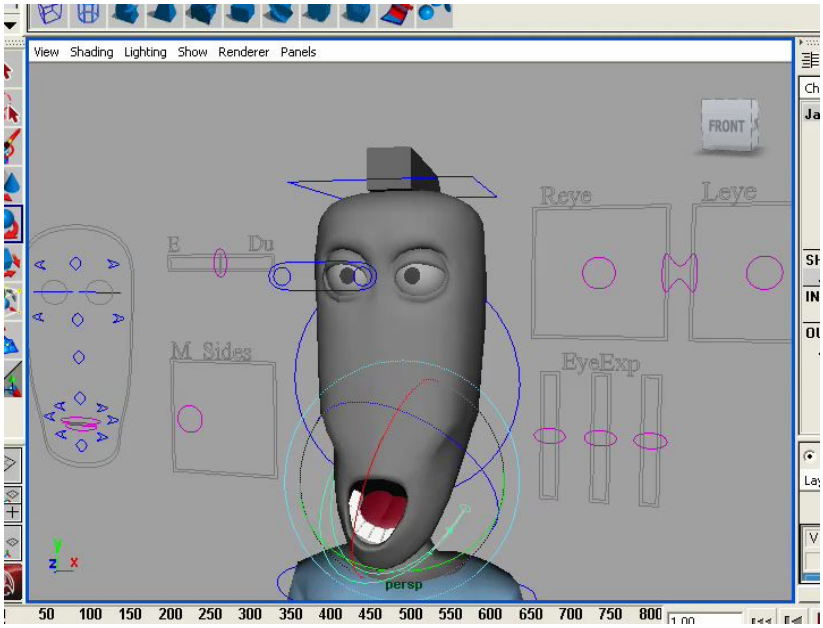
· Color Map for Min

· Color Map for Sea Monster

Rigging

The rigging process covered characters and props. Kuo, Min and Sea Monster were all rigged using a Maya plug-in called The Setup Machine (TSM). TSM binds a standard skeleton system to a character mesh. It simplifies the process of conventional skeleton setup and weight painting. It also automatically generates controllers for character animating, making it a huge time saver. After body rigging, I created facial expression controllers. I used the ***Stop Staring*** book as my reference and my controllers combined Blend Shape, Skeleton and Nonlinear methods in Maya. To achieve the cartoonish effects, I used the methods of squash and stretch functions in both body and facial controllers.

Prop rigging were applied to create the bending of palm trees and paddles, and also to enable the swinging of the rope. I first tried to simulate soft body effect of the rope using Maya Hair System, but the result was too realistic and a cartoonish effect was hard to achieve. I eventually used skeletons with spline IK and manual controllers to simulate the rope swinging.



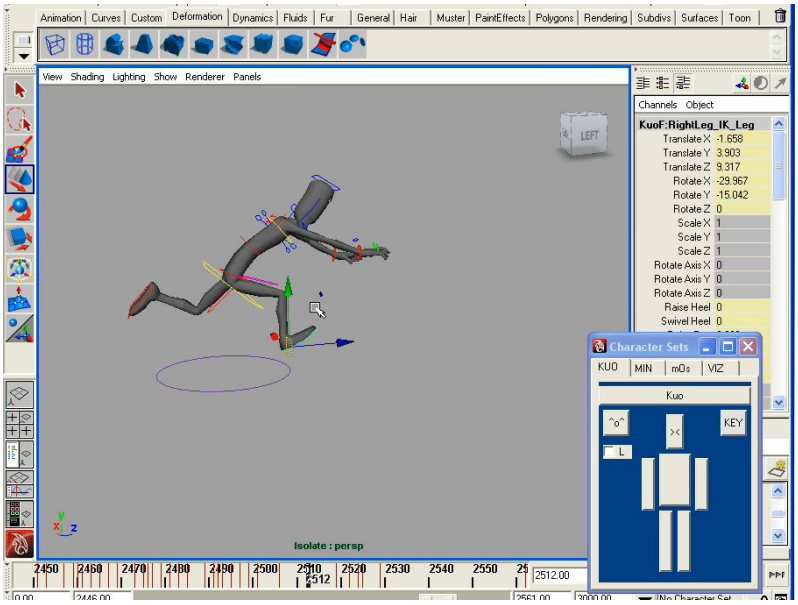
· Facial Expression Controllers

Animating

Animating took most of production time for my thesis. Only convincing animation best tells a story and lures the audience. Before I began animating, I created an empty scene file and imported my characters and props as reference. The advantage of doing so is that I can go back to the original files and make any changes to my original models and the referenced files will be updated automatically. This also reduced scene file size tremendously. After importing and resizing character proportions, I began my animating.

Since I have three characters and need to frequently switch character sets for key frames, I created a window with Mel Scripting to switch among character sets, low poly, and high poly models to speed up my animating process.

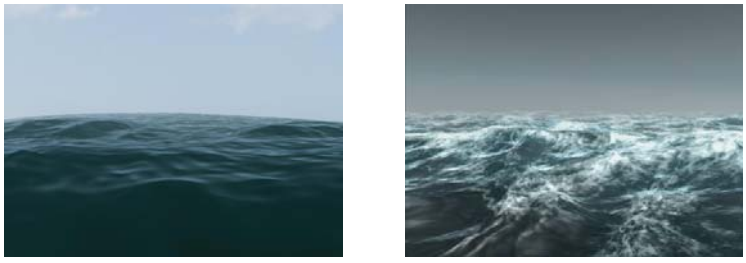
I animated with low poly models to save computer resources, and it can playback smoothly in Maya. But when it came to the final stage of my animation, each character had a numerous amount of key frames and Maya cannot playback in real time, in this case I had to use play blasts to guarantee the accuracy of my animating.



· Character Set Switch Window

Special Effects

I used Maya Ocean to simulate ocean effects. Maya Ocean is a top effect function to mimic either stormy or calm oceans. In my story, I needed a very calm blue sea. I achieved this effect through some property adjustments in Maya Ocean, such as Wave Height, Wave Peaking, Wave Speed, Ocean Color, and many more. With adjusted reflection and refraction settings, all the props in the scene are reflected on the ocean surface. I applied Ocean Surface Locators to the lifeboat and the coconut so they were going up and down with the sea waves creating a buoyant floating effect. I also applied Create Wave and Foam Emission functions to simulate the ripples and foams as the lifeboat sails across the ocean surface.



· Examples of Maya Ocean

Lighting

I applied a new feature in Maya 2008 called mental ray Physical Sun Sky shaders as my lighting design in the film. The mental ray Physical Sun Sky shaders are designed to enable physically plausible daylight simulations and accurate renderings of daylight scenarios.

Since my story occurs at noon, I set the light origin to around three o'clock in the evening. This setting created a strong sunlight. The angled shadows also brought out the characters and props. This new feature can simulate real sunlight and global illumination, generating real shadows. Only a few fill lights need to be added under this function and a lot of time was saved compared with the conventional lighting set-ups used to simulate sunlight.

Rendering

My film was rendered using Maya mental ray. Maya mental ray offers all the traditional features for photorealistic rendering. It applies a new technology called Global Illumination and Final Gather, which simulates real light source and calculates direct and indirect lights and light bounces between objects. This rendering method produces high quality and realistic images. With the old version of Maya mental ray, this function was both time consuming and resource intensive making it only applicable with high-end workstations. With Maya 2008, this function has been greatly improved. Physical Sun Sky shaders' function has also been optimized for regular workstations. With the render farm resource at school, all my images could be rendered quickly and this saved me lot of time for final editing. I chose Maya render layer as my file output format, which enabled me to render out individual layers of images to finally composite them together in After Effects.

· Ocean rendered with Physical Sun Sky shaders
(Mental Ray)

Post Production

Music

CoCo Nut is meant to be whimsical and cartoonish. Since my characters have Chinese opera faces, I wished to have a piece of joyful, oriental music to match the visuals. My film music was composed by Robert Summers Potterton, a student from School of Music at Houghton College. Robert created the music according to a rough cut version of my film I sent to him. I'd also like to take this opportunity to thank him for his wonderful job. His music definitely added much charm to my film.

Compositing and Editing

For the compositing stage of post-production, I used mainly Adobe After Effects. I did all the compositing on a shot by shot basis, including different layers of images rendered in Maya.

When well planned, many special effects and modifications can be done in 2D using After Effects. A large amount of time can be saved while achieving the same effects of 3D rendering. Take motion blur as an example, I used a plug-in called Magic Bullet in After Effects, which was much faster than using Maya's 3D blur. Of course, the 2D effects are still not as accurate as 3D, thus it is commonly only applied to fast motion sequences and camera cuts. After the compositing was completed, I exported each shot sequence as QuickTime clips for final editing.

Editing was done primarily using Adobe Premiere Pro. Since I had a well-planned out animatic during my pre-production stage, I simply substituted the rough cuts with my completed clips. Fine cutting and dissolve effects were added, and each cut and transition was made intentionally to give meaning and to maintain coherence of the entire story. The final stage was to synchronize music and sound effects with each specific camera shot.

· Compositing at After Effects

· Editing at Premiere Pro

Conclusion

Thesis production is the last and the most important phase of my three year study here in America. This is the opportunity to demonstrate my mastering of film theory and practical techniques in the past years. The one and two-quarter films were a warm up for my final thesis production. They also gave me a chance for self-assessments, to ponder on my proper position in this industry.

I had a six months internship at Fisher–Price, and this experience lead me to my final determination to become a CG animator in the field of animation. Therefore character animation was my main focus in thesis production.

I graduated from college with a Bachelor of Science in Architecture. As an outsider of CG animation, I flew halfway across the globe to America to pursue my dream. In the past three years, I have been constantly challenged by confusion, bewilderment, and loneliness, during many times of which I had the thought of giving up. Again, encouragements and support from my family, advisors, and friends helped me to overcome these difficulties and accomplished what I have been dreaming of. This experience is to become my life's long treasure. It will definitely benefit me in my future career.

The biggest challenge I encountered during production was schedule planning. One year seemed long enough at first, however unexpected challenges arose in all production phases including conceptual standstill and technical limits. All of these could result in the general delay of the production. Efficient management of time and the proper balance of quality control become extremely important factors during the process.

As I watch my thesis, I realize that there are many parts of it I could have done better. For instance, I could have added some clouds in the sky to avoid monotony; character animation could have been more exaggerated and dramatic; slate and credit parts could have been better designed. All of these I have learned will better benefit me in my future productions into making my works more alluring and enchanting.

Once again, I would like to thank my advisors and my family for their support and encouragements. They gave me an opportunity to realize my dream and I feel very fortunate to be offered something that may never be possible to others.

My life long goal is to create meaningful works that would be both impressive and entertaining; that would convey meaning across all ages, cultures, and all walks of life without a single spoken word.

Lastly, I wish to dedicate this film to my homeland and country folks, wishing that all people living there would reach an agreement - we have a common home, and it is the only one we share, it is only through unity and co-effort can we make it a better place to live for all.

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// Chinese Opera Mask //

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// Autodesk Maya //

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http://www.3dtotal.com/

Appendix A

Original Thesis Proposal

Synopsis

Working Title: Survival
Producer: Jiunnfu Su
Budget: $ 38633 (Estimate)
$ 2325 (Actual)

Start Date: March 2006
End Date: May 2007
Running Time: 4 minutes
Release Format: DV NTSC

This project is a 3D animated cartoon and the story is about two people that escape to an island. But they have conflict over the distribution of coconuts. Finally, they realize the only way that they can survive is to work together. This concept comes from my country, Taiwan, where there are two political parties that are in conflict at all times that ignore the threat from China

Treatment

Two people fall overboard during a shipwreck and swim away while being chased by a huge sea creature. Both of them escape to the same small island. This island, with a higher elevation on one side, has nothing but a few trees growing on it. The tall and skinny person is called Kuo. The other fellow, who is short and strong, is named Min. Both of them hide under a tree to get some shade from the bright sun. After a while, they begin to feel very thirsty. Kuo looks up the tree and sees many large coconuts, but he does not know how to climb. Min can climb, so he climbs up the tree and starts throwing coconuts down to Kuo. After awhile, Min happily climbs down the tree reflecting on the delicious coconut juice waiting for him-- only to see that Kuo has already separated all the coconuts into two unequal piles.

There are nine coconuts in all; Min’s pile has four coconuts and Kuo’s has five. That makes Min really angry! After all, Min is the one who risked his neck to climb up the

tree to pick the coconuts! So he figures that he should have more coconuts than Kuo. However, that's not what Kuo thinks. Kuo feels that since he is the one who discovered the coconuts first, he deserves to have more of them. The two start fighting over the extra coconut. They both pull on it and it flies out of their hands into the water. Both of them see the sea creature in the water near the coconut and are afraid to try to retrieve it.

Each thinks it is the other guy's fault the coconut is lost, so they both sit alone with their pile of coconuts and refuse to talk to each other. When Min tries to open a coconut; he can't since the coconut's shell is too thick and hard. He cannot crack it open no matter how hard he tries. There are no tools around. He peeks over at Kuo and sees that Kuo has the same problem. There is nothing either one can do by themselves…so after trying they both got tired and fall asleep.

The sea creature sees Kuo and Min fighting and a weird smile appears on its face. Kuo, in deep sleep, feels something dropped next to him. It is the coconut that flew into the ocean earlier. Kuo looks around, but there is no one else besides Min, who is still sleeping. Kuo thinks that maybe the coconut is the gift to him from God, so he happily holds the coconut in his arms. At the same time, Min in his sleep feels some little rocks hitting him. He also looks around after he wakes up, but he sees nobody around but Kuo hugging the extra coconut. Min starts to get really angry. Min assumes that not only does Kuo take the coconut that should belong to him, but also throws little rocks at him too--parading in front of him. Min gets angry and goes over to fight for the coconut. The two start fighting again.

Soon Kuo realizes that he cannot win the fight with Min, so he just holds onto the coconut real tight. Min cannot loosen Kuo's grip on the coconut and he gets angrier. He picks up Kuo with the coconut and walks over to the edge of the cliff. Just when Min is about to throw Kuo into the ocean, he sees that the sea creature is already waiting there with its mouth wide open. Min feels bad for what he is about to do and hesitates. Kuo sees this opportunity and hits Min on the head with the coconut really hard. They both fall down to the ground.

When they get up and about to fight again, they both see that the coconut on the ground has split open. Min and Kuo look at each other and both let out an embarrassing laugh. Kuo suddenly has an idea, which he whispers into Min's ear. (The camera turns to

the sea creature.) The sea creature is annoyed because it lost the fresh meat. It swims over to the other side of the island and peeks over at Kuo and Min. Kuo uses the ropes to tie up Min and holds the tied-up Min high over his head. Kuo carries Min and walks step by step towards the cliff. The sea creature sees what they're doing and swims back under the cliff, cheerfully waiting with its mouth wide open. As the sea creature expects, Kuo laughs evilly and throws Min down the cliff. Min is about to fall into the sea creature's mouth and the sea creature bites down hard with much excitement. All of a sudden, the sea creature feels something stuck in his mouth that prevents him from getting his meal. The truth is that Min was only pretending to be tied-up. He was really hiding a stick behind himself that he used to prop open the sea creature's mouth. The other end of the rope is actually tied to the coconut tree. In addition, the coconut tree is bent and tied down on the ground. So, right after Min props the sea creature's mouth open with the stick, Kuo loosens the coconut tree. The coconut tree flies back and throws Min and the sea creature high into the air. Min lands safely but the creature is long gone! It lands on a passing ship with an American flag painted on its side. Min now holds a complete set of the sea creature's teeth in his hands. Kuo and Min high-five each other and celebrate the success of their working together.

In the end, they sit around a campfire, happily using the sea creature's teeth as an opener for the coconuts and drinking coconut juice. Relaxing, they watch the American ship wobble towards the horizon with the creature's tail sticking up in the air.

Thesis Budget

Working Title: Survival
Producer: Jiunnfu Su
Budget: $ 38633 (Estimate)
$ 2325 (Actual)

Start Date: March 2006
End Date: May 2007
Running Time: 4 ~5 minutes
Release Format: DV NTSC

ITEMS	CONENT	ESTIMATE	IN KIND	ACTUAL
Preproduction				
Research	40 hours x $15	$600	$600	$0
Script	80 hours x $15	$1200	$1200	$0
Storyboard	80 hours x $15	$1200	$1200	$0
Character Design	40 hours x $15	$600	$600	$0
Background Design	40 hours x $15	$600	$600	$0
Animatic	20 hours x $15	$300	$300	$0
Hardware	Computer	$2000	$0	$2000
Software	After Effects	$999	$999	$0
	Photoshop	$649	$649	$0
Production				
Software	MAYA	$6999	$6999	$0
Modeling	500 hours x $15	$7500	$7500	$0
Animation	500 hours x $15	$7500	$7500	$0
Rendering	120 hours x $15	$1800	$1800	$0
Postproduction				
Software	Sound Forge	$400	$400	$0
	Foundry Vegas	$560	$560	$0
Soundtrack	60 hours x $15	$900	$900	$0
Composition	80 hours x $15	$1200	$1200	$0
CD-ROM	50 pack	$25	$0	$25
DVD-ROM	15 pack	$30	$0	$30
Videotapes	12 pack	$13	$0	$13
DV tapes	3 pack	$20	$0	$20
Envelopes (10”x13”)	20 pack	$20	$0	$20
Print papers	500 sheets	$6	$0	$6

TOTAL	**$35121**	**$33007**	**$2114**
GRAND TOTAL (TOTAL x 1.1 %)	**$38633**		**$2325**

Thesis Timeline

Preproduction

2005_3 Spring	Week1	Concept Development
	Week2	Research
	Week3	Script Draft
	Week4	Script Draft
	Week5	Script Draft
	Week6	Script Draft
	Week7	Thesis Proposal
	Week8	Thesis Proposal Revise
	Week9	Thesis Proposal
	Week10	Character Design
	Week11	Scene Design Refine
	Week12	Storyboard
	Week13	Storyboard

Production

	Week1	Animatic
	Week2	Modeling: Main Character I
	Week3	Modeling: Main Character I
	Week4	Modeling: Main Character II
	Week5	Modeling: Main Character II
	Week6	Modeling: subject character
	Week7	Modeling: subject character
	Week8	UVmap
	Week9	Blendshape (Main Character I)
	Week10	Blendshape (Main Character II)

	Week11	Blendshape (subject character)、Texturing
	Week12	Texturing
	Week13	Texturing
2006_1 Fall	Week1	Rigging
	Week2	Rigging
	Week3	Character Modeling Check
	Week4	Modeling: Scene

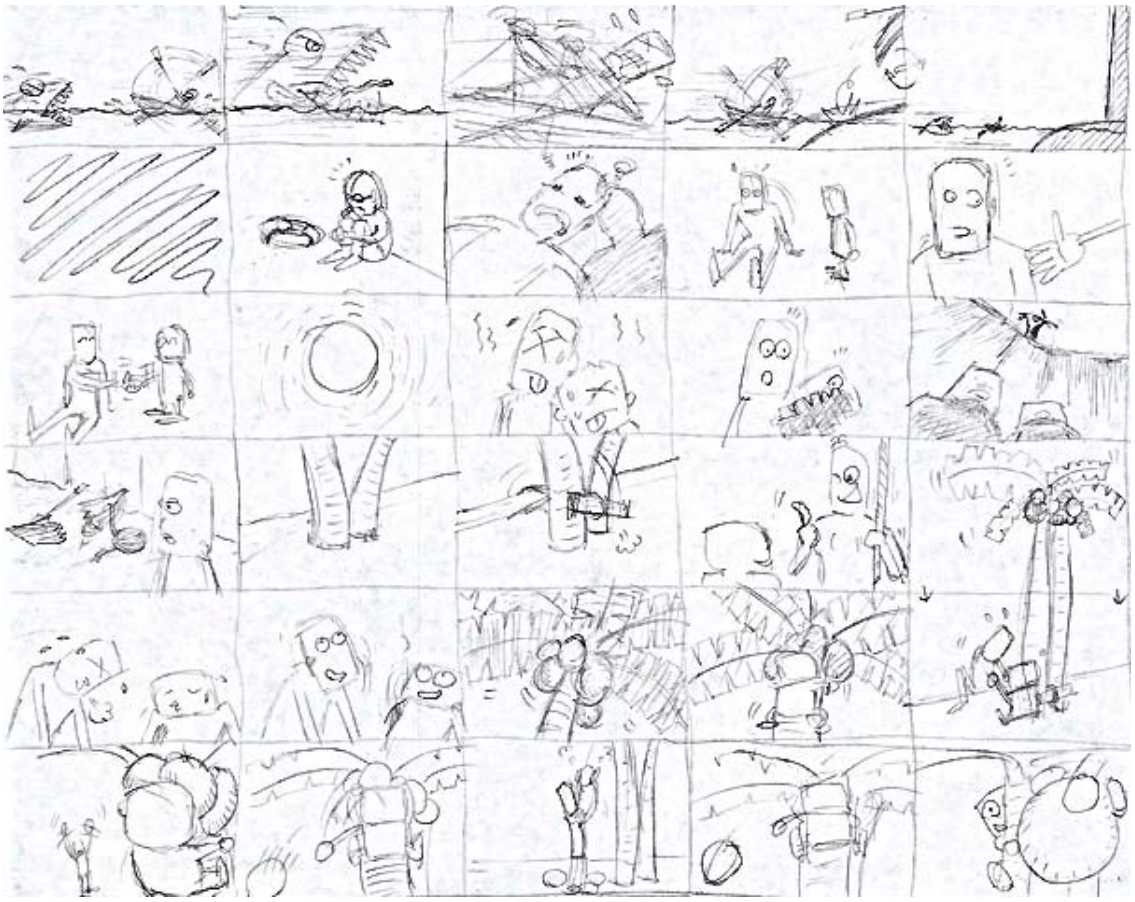
2006_1 Fall	Week5	Modeling: Scene
	Week6	UVmap
	Week7	Texturing
	Week8	Scene Modeling Check (Lighting)
	Week9	Animation: Pass I (Key Pose, Camera Setting)
	Week10	Animation: Pass I
	Week11	Animation: Pass I
	Week12	Animation: Pass I
2006_2 Winter	Week1	Animation: Pass II (Linear)
	Week2	Animation: Pass II
	Week3	Animation: Pass II
	Week4	Animation: Pass II
	Week5	Animation: Pass II (Facial Expression)
	Week6	Break
	Week7	Animation: Pass III (Spline, Refine)
	Week8	Animation: Pass III
	Week9	Animation: Pass III
	Week10	Animation Final Check
	Week11	Render I; Collect Sounds
	Week12	Render I; Collect Sounds
	Week13	Render I; Collect Sounds
	Week14	Special Effect I

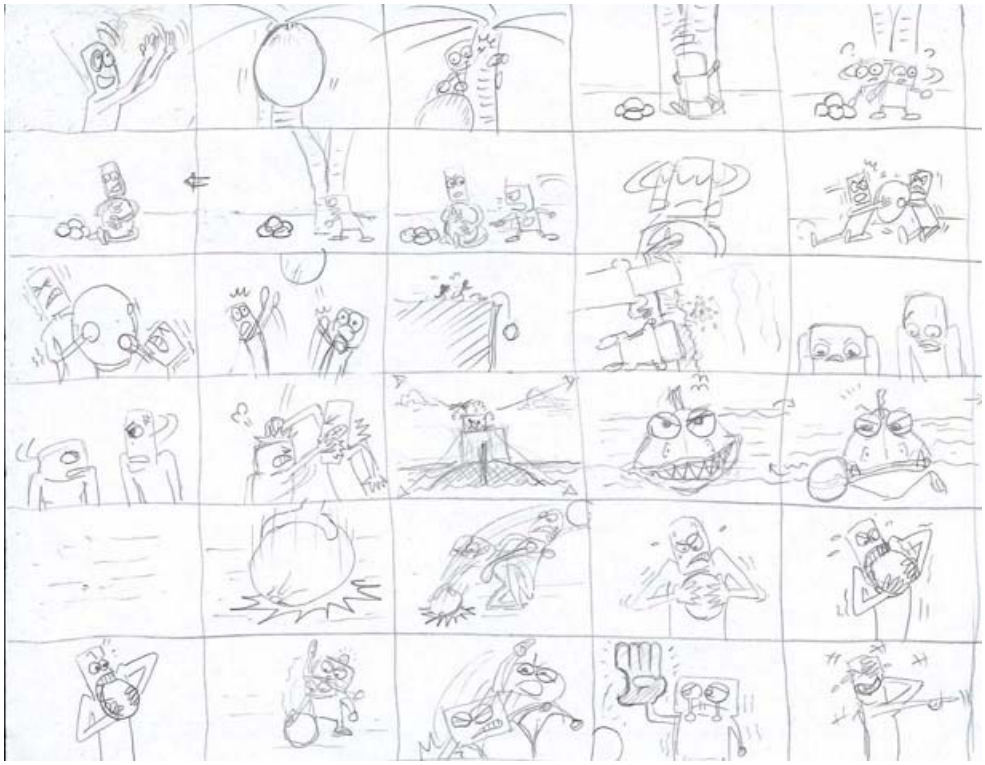
Postproduction

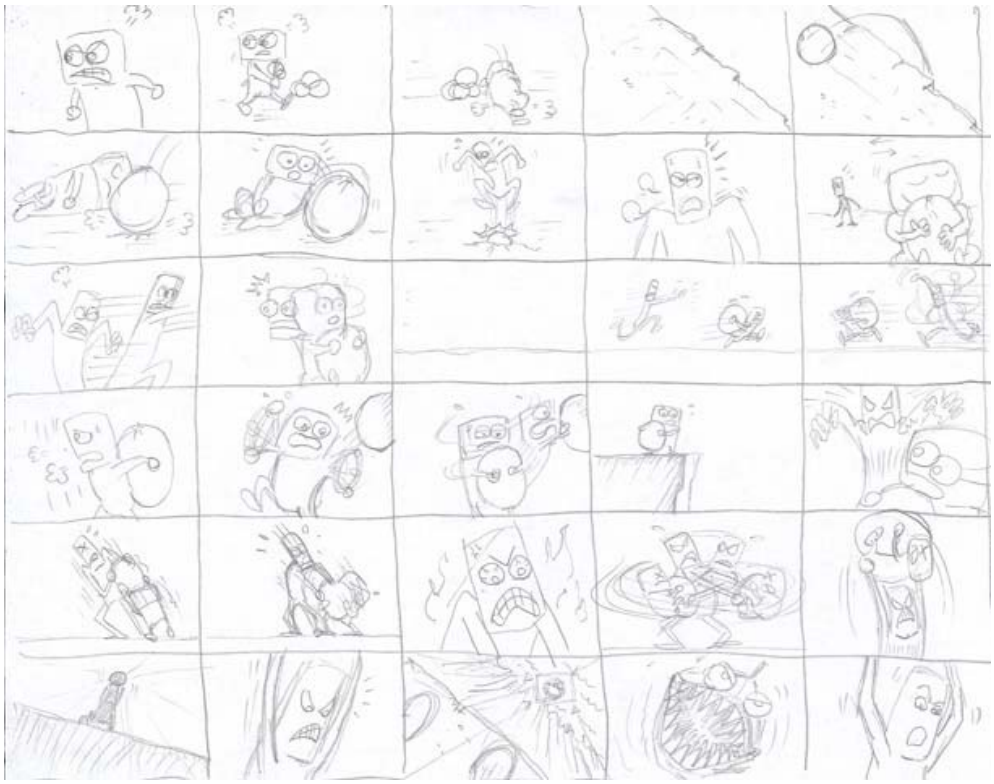
	Week1	Images Composite & Edit
	Week2	Opening & Ending (Credit)
	Week3	Render II; Collect Sounds
	Week4	Sound FX & Edit; Special Effect II
2006_3	Week5	Final Render Check
Spring	Week6	Music Composing
	Week7	Music Composing
	Week8	Sound & Music Adjust
	Week9	Final Check & Fix
	Week10	Transfer to DV, Tapes, DVD

Appendix B

Complete Storyboard







Appendix C

Color Prints