Reproducing the Chinese Ancient Heroic Figure “Xiang Yu” Using 3D Graphics Technology

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Reproducing the Chinese Ancient Heroic Figure “Xiang Yu” Using 3D Graphics Technology

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College of Imaging Arts & Sciences
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Thesis Documentation for the Master of Fine Arts Degree

February 2014
Thesis Committee Approval

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1. Abstract:

The ancient country of China has a long history. It has many fascinating historical stories, historical figures, and an elaborate history. For people who want to learn about Chinese history it can often seem overwhelming.

I am planning to find an easy and interesting approach for people who are interested in learning about Chinese history. The effective approach to communicate to people could be enhanced visuals depicting the rich history of China.

Out of this long history, I decided to reproduce a Chinese ancient heroic figure with 3D graphics technology. I will achieve this by using 3D modeling technology, using nCloth, particles, fur, lighting, and rendering to create an ancient Chinese hero, and historic environment. I will create 3D animation, and use motion graphics to make the beginning and end pieces for historical scenes. This piece of scene will display a realistic historic story: with two main characters (the hero and his wife) in this project.

2. Introduction

Story

The story takes place from 206 BC to 202 BC between Xiang Yu, the King of Chu, and Liu Bang. Xiang Yu was besieged at Gaixia and was low on supplies. His beloved wife, Concubine Yu, for fear that she might prove a burden to her husband in an attempt to break through Liu Bang’s army surround, ended her life with a sword.

After the collapse of the Qin Dynasty, both Xiang Yu and Liu Bang tried to claim their power. At this time, Xiang Yu was the grandson of a general in the Chu state and Liu Bang was the son of a peasant. Xiang Yu killed King Huai who had promised that the first to enter Xiangyang (capital city of Qin Dynasty) will be the king. He proclaimed himself to be the King of West Chu. At the same time, Liu Bang was proclaimed as the King of Han.

Liu Bang developed agriculture, trained soldiers and built up his power secretly. As a result, his power became stronger and grew very quickly. However, Liu Bang was planning to turn the tide against the war. He was good at choosing the right person and effective military strategies for the war. Not long after that, Liu Bang broke the agreement and Xiang Yu’s troops were chased out of the Chu. Eventually, Xiang Yu committed suicide at the Wujiang River. As the war was ending, Liu Bang set up the Western Han Dynasty.
3. Design

Concept

The goal of Chu culture is to develop and maintain an ancient tradition, represented by Qu Yuan. His work constitutes a fairly prominent romantic Southern culture system; in essence, it is the original Chu continuation of ritual dance, which is a witchcraft culture. “Han after Qin, followed its traditional culture,” but shaped in some aspects of ideology, especially in the artistic spirit, the Chinese cultural heritage is the essence of Chu culture.

In order to combine 3D technology with Chinese culture, to convey the unique oriental glamor. A certain way can show the flow of power, using intangibly to form shapes. New forms combine the concept of character, elegant, water chestnut, 3D form. All the characters have been integrated into the design of my own concept of oriental aesthetic, is how to make the ultimate effect of rendering the characters I’m able to meet to consider the concept of setting. I tried cartoon specific material, but the overall effect is so cartoon feelings. I was learning traditional Chinese painting when I was a child, which may be combined with the ink material to my characters. Then I test it in Maya shader node, and ultimately meet my concept setting.

I choose to use Ink wash painting, also known as literati painting which is an East Asian type of brush painting that uses black ink - the same as used in East Asian calligraphy, in various concentrations. Asian aesthetic writing is generally consistent in stating the goal of ink and wash painting is not simply to reproduce the appearance of the subject, but to capture its spirit. Ink wash painting uses tonality and shading achieved by varying the ink density, both by differential grinding of the ink stick in water and by varying the ink load and pressure within a single brushstroke.
Figure 2. Liu Bang concept design

Figure 3. Opening animation

Figure 4. Final appearance
Character Xiang Yu

Xiang Yu (232 BC – 202 BC) was a prominent military leader and political figure during the late Qin Dynasty. Xiang Yu was a warrior unmatched in history. He ruled the people in the uprising against the Qin, achieving unparalleled victories that continue to fascinate generations thereafter. He was born at Xiaxiang and was granted the title of “Duke of Lu” by King Huai II of Chu in 208 BC. The following year, he led the Chu rebel forces to victory at the Battle of Julu against the Qin armies. After the fall of the Qin Dynasty, Xiang Yu proclaimed himself “Hegemon-King of Western Chu.” In a long struggle for power with Liu Bang, known as the Chu-Han Contention, he eventually was defeated and committed suicide at the bank of the Wu River.

Xiang Yu is my main character, as I described above, since he was born an aristocrat, he is young, and he is the military leaders. His physical power is amazing. So at very beginning, I designed him as a super- muscular hero, well-developed muscles. However, this will be a little cartoon feel. I began to consider the proportion of this role is designed to a live person with obviously muscles shape. Thus, this is accordance with the identity of the status of nobility and military leader.

To fill in more details to show his lordship, such as delicate carvings on the helmet and belt (FIGURE.5). I designed defined boots and ponchos. Wrist brace also made detailed pictorial carvings. All Patterns are designed by looking for history documents, research, and then made patterns to alpha brushes, then applied to the body of the character.

For the characterization of the face, I used a more angular oriented approach, so that people look more vicissitudes of life, a sense of power. For the clothing, I did tear, damage feeling. So let the characters seem more realistic. The same fabric is also carved detail to show the character of the ordinary.

In the final rendering, many details are not able to show it. However, the customer ink shader in Maya exhibits angular feel what I want, but also the flow of Chinese ink painting transparent feeling. In particular cloak and long hair part, have a sense of layering and transparency gradient. Individual objects in the flow feel there is strength, which is its essence.

He was seen as an extraordinary person because his unique double pupil was a mark of a king or sage in Chinese tradition. Xiang Yu was about 6’ 1” and had unusual physical strength as he could lift a ding (an ancient Chinese huge vessel resembling a giant cauldron on tripods).

Xiang Yu retreated to the Wu River. He had a chance for survival. A ferryman prepared a boat for him to cross the river, strongly encouraging him to escape, since he still had the support of the people from his homeland in the south. Due to his tough personality, he was too ashamed to go back and face his people. He refused to cross the river, but asked the ferryman to take his warhorse Zhui back home.
Figure 5. Xiang Yu sculpting details

Figure 6. Xiang Yu front view

Figure 7. Xiang Yu side view
Character Liu Bang

Liu Bang, was born into a peasant family, and was the first emperor of the Han Dynasty. He was called Gaozu of the Han Dynasty.

Liu Bang and Xiang Yu reveled against the despotic rule of the Qin Dynasty and led the army uprising against the Qin. Liu Bang and his army attacked Xiang Yang, the capital of the Qin and overthrew the Qin Dynasty. During the next four years, Liu Bang and Xiang Yu went through a series of battles, known as the Chu-Han War. Liu Bang was the winner at last. Credited with his ability to both adopt his subordinate’s good advice as well as with the political acumen to unite other anti-Xiang Yu forces, he eventually won the war.

Character of Liu Bang has a more complicated personality; do not like Xiang Yu straightforward. His age is 40, wily, a military leadership. Portrayal of this character I play down his facial features, with hard armors to show his personalities. He is Hidden him behind layers of armor. Do not incline to
expose himself in front of the enemy. Protect him with ice armor. However, this person is also very attractive. I used to bring elegant silk on his helmet to performance figures of this chic, bold way. For Liu Bang's armor portrayed I also want to highlight their sense of hierarchy, with a small part of the helmet superimposed to show the complexity of the characters. The whole armor characters are wrapped very tightly, as his personality; do not let others know his heart. From the description above, taking into account his peasant origin, unlike Xiang Yu's character set, he is unassuming. He is better at protecting them. Armor has played a very good role of it.

For ages consideration, because Liu Bang is at his older middle-aged, I made his pose a little bit forward, to show the age of this period. The body curve lines of Liu Bang did not obvious compare to Xiang Yu.

The final scene of Liu Bang; he was standing on the carriage, surrounded by spears. This scene set highlight Liu Bang's feature. He did not have an extraordinary ability as Xiang Yu, needs additional help to achieve his goals. Cannot see his face under layers of armor, but it is awe-inspiring atmosphere, elegant but with a sense of power.

In 202 BC, Liu Bang established the Han Dynasty with the capital of Chang’an (present Xian). In the history books, the dynasty was called the Western Han Dynasty. As emperor, Liu Bang took a series of measures that were good for his people. He ordered the reduction of field taxes levied on the peasants and let the armies go back to farming. Because of his strong leadership and effective measures, the economy recovered quickly and stability returned to the society. In the annals of Chinese history, Liu Bang was regarded as an emperor who contributed a tremendous amount to the prosperity of the Han Dynasty.
Figure 11. Liu Bang side view

Figure 12. Liu Bang final appearance

Figure 13. Liu Bang rigging
Yu Ji

Yu Ji is one of the most unforgettable females in Chinese history. She is Xiang Yu's spiritual strength. Her pretty face could astonish the world. She was well educated and learned martial arts in her childhood. She witnessed her country and family collapse, and hated war from the bottom of her heart.

In 209 BC, Xiang Yu and his uncle Xiang Liang started a rebellion to overthrow the Qin Dynasty. Consort Yu's older brother, Yu Ziqi, was serving in Xiang Liang's army as a general then. Yu met Xiang Yu fell in love with him and became his concubine. Since then, she followed Xiang Yu on military campaigns and refused to remain behind.

For Concubine this character, as previously mentioned, she received a good education, training for martial arts. I came up with 10 or 15 different ideas for the Yu Ji. I try to keep my female character within varying levels of an acceptable decency due to eastern art. There was no over-emphasis on her looks. Additionally, she also looks pretty average; nothing was exceptionally noticeable about her. Therefore, I designed a mixture of the soft contours of the East and the West to show this character. The floating of long hair and scarf help keeping this attention. Her support for Xiang Yu is more like a spiritual way, as a goddess. The curve of body lines is very obviously; this point is corresponding with character Xiang Yu. They both have the distinct personality, Ganaiganhen, unlike Liu Bang, who buried himself deeply.

Long ribbon around the entire figure and then use red to decorate (FIGURE.16) makeup the whole the characters vividly. To make this figure even more unique, and I set the action felt she had to have a traditional oriental women's morbidezza. I described it as “sexy… A bit mystery and a bit absurd.” Dress, hair, combined with gentle movements, the most incisive performance characteristics of oriental women.

She is my favorite character. She is practically come to life.
Soldier, Weapon

According to historic documentary, weapon during this period were very refined. Manufacturing this kind of weapon was quite a challenge. The army is equipped with a highly advanced weapons system. Besides the complex weapon system, the army is divided into different forces. Certain forces have equipment with specific weapons. The most important is the long spear, it is about nine feet and can be used to hack or puncture. With this type of long spear, the soldier can fight one on one.

All of the different forces are connected and can protect each other. Armor is functional as protection. Main force soldiers just have armor that covers their chest and back. For part of the helmet,
leather is the main material. The soldiers from the archery forces have no armor at all, in order to move fast. Considering the economic situation of both countries, they definitely have the ability to equip soldiers quite well. But there are just a few pieces of armor that are put on the body. It was a great honor to win the war at that time, so culturally soldiers had a strong desire to go to war as it was the spirit of these chaotic times. They both have advanced and powerful attack weapons, but do not care about wearing armor, which is too heavy and too slow for fighting. Maybe it is the rule for the entire army. This is why I made my character with little armor on, and used clothing designed to cover the chest and back. There are also different ranks, so I created three types of visuals. One is with more delicacy armor; lower rank soldiers wear clothing instead of armor.
Chariot

The most classic vehicle used to conduct military operations within the infantry is the chariot. Behind a huge chariot, there always follows the infantry. When attacking, both types of forces are moving forward together. The main features of the chariots during this period are four horses which pulled the chariot. Compared to the Qin dynasty, these chariots are narrower. With its tiny size, it can catch up to the cavalry. Soldiers on the chariot can have different weapons in cooperation with the cavalry.

To protect soldiers on the chariot, compared to the infantry, the armor is much better and more sophisticated. Most have heavy leather to cover themselves. Some of the horses are also armed with heavy leather. The main body of the chariot is covered with bronze nails.

An important element of the army is the chariot, and four types of chariots were found. In battle the fighting chariots form pairs at the head of a unit of infantry. The principal weapon of the charioteers was the Ge or dagger-axe, an L-shaped bronze blade mounted on a long shaft used for sweeping and hooking at the enemy. Infantrymen also carried the Ge on shorter shafts, ji or halberds, and spears and lances. For close fighting and defense, both charioteers and infantrymen carried double-edged straight swords. The archers carried crossbows with sophisticated trigger mechanisms capable of firing arrows over 800 meters.
Butterfly Animation

The most important aspect for butterfly animation is how to animate its wing movement. First I moved the butterfly's wings pivot point to the center of the body, now if I rotate either wing, it shakes naturally. So both of the wings will shake as time goes by, I put an expression to them.

“butterfly_shaking:polySurface1.rotateZ = sin ((time*25)*40);”

This expression shows the butterfly's wing will shake along the z axis with time, and this time follows the mathematic function Sine, which will loop the time. For the purpose of judging shake speed, I add extra numbers to accelerate its movement.

Finally, I attach the butterfly to the motion path which I created with the “CV Curve Tool.”

Figure 22. Butterfly motion path animation

Figure 23. Butterfly and grass animation
Horse Reins Animation

For the horse reins, I tried to use nDynamics and nConstraint to create animation. I made horse reins with Cloth, and selected its points and constrained it constraint to a collision object, in this case it is the general’s hand. The results turned out to be out of control, and its motion too slow to match the movement of the horse which was attached to it.

After trying different methods, I came back to the traditional method and set the joint chin to follow the horse reins, and then I added “IK Spine Handle Tool” for this joint chin. The final step is adding the cluster under deformers to the curve.

Figure 24. Horse joint chin

Figure 25. Horse rigging front view
Hair Animation

For the female hair, I created two joint chins to follow her hair shape, applied the “IK Spline Handle Tool” to the joint chin, and made “Auto create curve” selected in the option box. Then I will get a new curve to follow along with the joint chin. By selecting this curve I can move her hair dynamically. Now I have two curves to control. I will able to use this curve as the “Spline IK” curve too.

Grass Animation

I created the grass animation with Maya fur system. I made a poly plane first, and then applied grass fur preset to the selected object. I opened the grass attribution tab and changed the density and global scale. In order to add more details to the grass, I tweaked the noise amplitude under length option for a more natural look. For grass animation, I used a new hair system to constrain the grass movement. I created a hair system on the same polygon plane with the grass; then I attached the hair system to the fur. Now I can control the fur grass movement with the dynamic feature of the hair.

Ink Node in Maya

For Chinese traditional ink painting, the most important is the ramp spreading; this is how the feeling of levels conveyed. I first create a Ramp Shader in Maya Hypershade editor. The base color for the Shader is black, and then I apply it to the models with UV layout. The default for transparency is black; it means nothing can be seen through it. In the option selected color, I applied a noise node to control its color. When it came to the attributes I turned the amplitude to a lower point. To stretch I changed the UV set as well.

I also needed one more ramp link for noise color balance. I connected the new ramp node to the color balance’s color offset. At this point, the direction of the ramp depends on your UV layout, so one should be very careful of their U Ramp or V Ramp. Then I played with the noise number to get the results that I wanted. For the last step I needed a Gamma Correct to change the color. I linked noise to Gamma and increased the value to create more contrast.

Figure 26. Ink node in Maya
Mountain Node in Vue

As terrain editor in Vue, I used paint brush to create the base shape of the mountains. First of all, I need to increase the resolution of Default Mountain in order that I can work on enough polygons. I raised my scale to 2048 (this depends on your computer, if you have a real powerful computer, here you can go really high, but for me 2048 is sufficient). After this, I judged my brush size, flow and fall off to start sculpting. The number for global settings needs to be experimented with. I also made some customer brushes in brush editor; this is much easier for me to make some unique mountain shapes. For brush editor I can change the falloff filter or use my own mask as the filter for brush just as in Photoshop. One of the fascinating aspects for using the painting brush is you can freeze mask for certain parts, and just keep painting areas and not influence the mask parts.

Figure 27. Mountain appearance in Vue

Figure 28. Mountain node in Vue
Motion Graphic

For motion graphics, I set up all different scenes and cameras, rendered out the animation in Maya, and imported image sequences to Adobe After Effects for post production.

For the first view, I have depth of field for the moving grasses. I had two options here, one is using the depth of field attribution in after effects camera, then key frame distances. The more accurate one is choosing Maya camera Mia Lens Bokeh. Attach this node to camera mental ray attributes. It is extremely time consuming to render the scene out, but it's worth it.

My greatest weakness is timing. Compared to the sensitivity of camera movement, besides the technical part, patience is the key component for motion graphics. I also used the 3d feature in after effects. I set up the 3d camera and 3d layers and reused some footage for compositing. Scenes like flags waving, spears flying through the sky, and soldiers fighting are used 3d camera. I learned many new skills from this such as: how to use different layers as masks, how to use video footage as the alpha channel and how to do 2d tracking and particle systems in after effects.

Figure 29. Compositing layers in After Effects

Figure 30. 3D Camera in After Effects
4. Technical Process

High Poly And Low Poly Modeling

Physical attractiveness is the degree to which a person’s physical traits are considered aesthetically pleasing or beautiful. Apart from physical accuracy and attractiveness, how to resolve it digitally is another story.

For the character modeling, I did base mesh in Maya, this is the first level. Then I transferred models to ZBrush for more detail sculpting. The second general level is before adding more details to the base mesh which I did in Maya, I need to subdivide a couple of times to sculpt the main form. The first level is for adding final facial details. The second level can be done in standard subdivisions; the last level can be done in HD subdivisions. If you try to reach the final level (HD subdivisions), it is dependent on the typology of your models. Once you reach a couple of million polygons, any further subdivisions can be done in HD. All the HD data can be baked to normal and displacement map.

The computer for working on these models is the key point for how many levels can be subdivided. In order to enter HD sculpting and painting, I need to hold my mouse hover point to the part of the model I want HD for, then press keyboard “A”. After a moment of processing, I will enter HD mold. I can keep sculpting and painting the lighter area. The dark area is temporarily masked and cannot be used. Press letter “A” again to exit HD mold. Move mouse cursor to new area to work on it.
First I try to use Maya hair system and shave and haircut to create all characters’ hair, but it turned out to be very difficult to make hair movement to match actions. The rendering is very time consuming, and always causes problems. For instance, after certain frames, the render result is out of order. Most important is that the style does not match the character. I am planning to give some very abstract looks like harsh edges and contrasting colors. I need to find a new way to make my character’s hair. So I created curves, along with these curves, I made a polygon shape as the perfect match for the concept I want. For hair animation, I created lattice deformed to control it. Then parent it to head rigging. I did the same lattice deformed for character’s clothing animation. In order to make the entire lattice attached to the hair move softly and correctly, I needed to key each level and at the same time make some variations, like waves. This really saves time for rendering. It turned out to look fantastic and it is exactly what I wanted.

Hair

Figure 33. HD sculpt in ZBrush

Figure 34. HD sculpt subdiv levels in ZBrush
I also tried a script called GMH. It can create realistic looking Maya hair in 6 steps. This script helps the artist to convert and edit polygon hair to Maya Hair easily. With the interface provided: it easily manages and organizes hair strokes, follicles, and hair Systems and Hair dynamics. The most intricate part is editing style per follicles, adding extra hair. It was a good experience but it is too detailed compared to what I want, this is too much, deformers seem to work well for this project.

**Mountain Node**

For the mountains, I sculpt all the mountains in eon Vue. Vue is definitely the number one choice for creating realistic, natural 3D environments.

I create a default procedural terrain for my base mesh in Vue. At this point, the default mountain is pretty standard. I open the function editor, and load my mountain fractal noise to replace the default shader. I raised gain to a high number to get more visual variation. I have two main scenes that need to show mountains. One is more flat looking and the other one needs to have high hills. For the first more flat mountain I reduced base roughness, since I don’t need that many details. In order to change the height of the mountain, I played with the flat level (per iteration) and the ground level, to match the size and height for what I wanted. These two features helped me reach the final result. For the high mountain, I also increased the scale factor to add more details for the ramp ranges; this will give more contrast with my ink shader.

Vue does have numerous ink shader collections to use. I tried different types such as gray mountain Rocks, which works fairly well.

![Mountain node in Vue](image)

Figure 35. Mountain node in Vue
5. Feedback and Revisions

Effective and timely feedback is a critical component to finish my final project.

Feedback to my final project comes from three main sources: my thesis committee, my classmates and my friends.

The main issue of this project is each scene is not correspondence. As my motion graphics is about an ancient eastern country, the story I am trying to tell is not familiar with most of the people. So people cannot understand what's going on at very beginning. All the scenes at very beginning are not connecting to each other. This is always my weakness.

In order to make my story make sense to people, my entire committees give me lots of experimental and practical advises. Like how to match the soundtrack, how to cover entire scene to transmit to the next scene, how to make the whole different keep same organic style. Which part of models needs to smooth, which part is not necessary. How to add more details to my characters in order to connect to my concept. Where to put the motion graphics title in order to make it looks more professional.

I greatly appreciate my thesis committee, classmates and friends. Without these feedbacks, I am walking blind. I will wander aimlessly through the dark, never reaching my destination.
6. Conclusion

The most significance of this project is to acquire the knowledge for how to manage a large project. This is the most complicated project I have done so far. I learned how to manage time, which is most important for me. My situation was a bit unique. I was off school and working a full time job, at the same time, I needed to finish this project with high quality. How to balance time and how to overcome technology issues was a precious experience for me.

From the very beginning, I was thinking about all of the things that needed to be done in such a short time, approximately 3 months or so, but everything was out of control at the end. There were many issues that I needed to resolve such as, how to make all of the characters unique looking with their own personalities, how to transfer a ridiculously high poly model to a low poly model. I am not a professional in character animation, so I wondered how I could make the animation as good as possible. Rigging is also a big challenge to me. When I came to the rendering part, the render time is also a difficult problem for me. If I just rendered with my original setting, it seems as if it will take for ever to complete this. So how to use a “fake” way to reach the same result in after effects is the other issue I need to face.

From the whole process of this project, I realized that, my original ideas and skills are very premature. I needed to improve my skills as the project continued. I needed to talk to my project advisors as they offer more experience and mature solutions. They helped me to develop my ideas and reach my goals.

I also learn so much from combination of concept design. I learned how to combine 3D design with traditional culture to create unique project. I have learned many technical skills to support my concept ideas. I also learned there is always a way to fix technical issues. In the process of developing concept and fixing technical issues, lots of things give me inspirations. The Chinese traditional painting training in my childhood is playing key role during my concept developing for this project. This also teaches me that, the graphics design is a consistent learning curve. Everything happened in your life may be a fantastic idea for your design inspiration.

Search is the other key point to accomplish this project. Sometimes when I am stuck in one place, I really don’t know how to keep going. I searched the internet to see how people have dealt with similar situations.

In the future, I need to be more organized from the very beginning of the project. I also need to learn how to develop a concept that is reasonable and achievable, and learn how to manage time and keep a budget under control.

I learned a great deal from this project including work hard and be honest with yourself.
7. Appendix

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Title: Thesis Title: Reproduce the Chinese Ancient Heroic Figure “XIANG YU” with 3D Graphics Technology
Submitted by: Ke Xiang
Date: Nov 10, 2009

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Thesis Proposal for the Master of Fine Arts Degree

Thesis Title: Reproduce the Chinese Ancient Heroic Figure “XIANG YU” with 3D Graphics Technology
by Ke Xiang

Abstract:
China, this ancient country, has a long history. It has many amazing historical stories, historical figures, and their elaborate history. Because of its rich and vast history it becomes a problem for the people who wants to learn about it.

I am planning to find an easy and interesting approach for the people who are interested in Chinese history. The effective approach to communicate people could be enhanced visuals depicting a rich history of China.

Out of this big history, I decided to reproduce the Chinese ancient heroic figure with 3D graphics technology. By using 3D modeling technology, using nCloth, particles, fur, lighting, and rendering to create a Chinese ancient hero, and historic environment. I will make 2D animation, using motion graphics to make the beginning and end piece of historical scene. This piece of scene will display a realistic historic story; there are two main characters (The hero and his wife) in this project.

Problem Statement:
Too many people are interested in Chinese ancient culture, including lots of foreign people. All I want to do is displaying a piece of scene of a Chinese old hero, using modern interesting techniques to show people a real Chinese character which is different from existing western characters. The project will give people a visual experience, at the same time to broadcast Chinese ancient culture.

I want to solve this problem by creating 2 – 3 minute motion graphics piece, which include 2D and 3D techniques. This motion graphics piece will show an ancient Chinese heroic character and his wife, and their contribution to Chinese culture.

Survey of Literature:
The inspiration of my thesis topic is from the movie series “The Load of The Ring” by Peter Jackson. It’s about a western myth story. In this movie series I focus on the character design and atmosphere effects.
Thesis Proposal for the Master of Fine Arts Degree

Thesis Title: Reproduce the Chinese Ancient Heroic Figure “XIANG YU” with 3D Graphics Technology
by Ke Xiang

Sources:

Historical references:

1. Title: Records of The Grand Historian (Shiji)
   Author: Sima Qian
   Date of Publication: Written from 109 BC to 91 BC

   The Records of the Grand Historian, also known in English by the Chinese name Shiji, written from 109 BC to 91 BC, was the magnum opus of Sima Qian, in which he recounted Chinese history from the time of the Yellow Emperor until his own time. (The Yellow Emperor, traditionally dated ca. 2600 BC, is the first ruler whom Sima Qian considers sufficiently established as historical to appear in the Records.) As the first systematic Chinese historical text, the Records profoundly influenced Chinese historiography and prose. In its effect, the work is comparable to Herodotus and his Histories.

   This book shows me the real face of historical events, and it gives me an outline to tell my story.

2. Lecture room

   Lecture Room is a popular TV program of China Central Television, mostly featured on CCTV-10, which invites scholars to provide lectures on various disciplines. In its early days, areas featured included biology, physics, economics, history and literature, with lecturers from around the world. Its focus has gradually changed, and recent programs have focused on Chinese history and Chinese culture. It was first broadcast on 9 July 2001.

Digital tutorials:

Modeling:

1. FREEDOM.OF.TEACH.ORGANIC.MODELIN

   I use this tutorial to train myself organic human body modeling. Accord this tutorial I will familiar with human body’s proportion, muscle distribution, UV mapping of body parts. Building all the major muscle groups of the body, from basic blocking to the finished model which with all the muscles.

Animation:

2. Digital-Tutors Character Setup in Maya

   This tutor provides basic skills of wave of front feet, control shoulder and body. Combine with FK/IK, set up character’s feature, small part movement. Spline IK, Component Editor, and Paint Weights tools usage.

3. Maya Gnomon Workshop Animation

   This lecture covers the setup of a two-character scene that includes a simple character, with few key
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able attributes, and a complex character with many key able attributes. I will approach setting major key poses, moving holds, extremes, overlap and contact positions together with adding and freeing tangent weight on function-curves. In-betweens are also used to control the contrast and spacing of movement in our animation. The end result is a fully realized scene that is believable and sophisticated.

4. Digital apprentice workshop animation foundation
You will teach this industry’s the most top tips technology, and the basic fundamental quality to be an animator. It teaches you how to create a vivid animation step by step.

nCloth:

5. Digital-Tutors Introduction to Maya nCloth
The course may let me study a brief skills of Maya nCloth relevance theory; establish a pattern artifice of material for clothing.

Fur:

6. DIGITAL.TUTORS.EXPLORING.MAYA.HAIR-AG

7. Autodesk Maya Techniques | Digital Hair
Autodesk Maya Techniques| Digital Hair is teaching you how to establish dynamic realistic hair. This course provides various hair posture technology challenges. The course has considered the project entirety creating technological process, especially it has applied to exaggerating synthetically, show rich unique hair curves. Every kind of hair technology creation has self-distinct outward appearance outline and animated cartoon.

Texture:

8. Gnomon UV Mapping for Games
This tutor describes tools, which use to create UV efficiently.

Including tools:
- UTE (UV editor)
- UV
- create UV Shells
- Mirroring UVs
- Transferring UVs
- Shell array
- Map
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- Focusing Resolution

9. Gnomon Hard Surface Texture Painting Vehicle       Texture Painting
UV Layout
Texture Planning
Using Reference
Metallic and Painted Surfaces
Painting Hardware and Signage
Painting Wear and Tear
Reflection and Specular Maps
Working with the Art Director

10. Character UV Mapping

Starting with a complicated humanoid character in an animation pose, it takes me through the process of
deforming the model to a projection-friendly pose. Then reduce the model structure detail to create a 2D
mesh suitable for texturing via a proxy model. After that it shows me how to transform those UVs to a
master object, which can be textured and animated. I’ll be able to take a complete 3D character and cre-
ate the desired texture space without stretching or overlapping, where every pixel on the model is unique
and can be either painted in a 3D package, or as flat art in Photoshop.

11. Character Texturing for Production

EHIND THE SCENES (BTS) is a new and exciting DVD series developed to showcase the creation of
a game cinematic sequence. The series follows a team of artists as they demonstrate their production
techniques from concept phase to final rendered animation. In this chapter of the BTS series Ben Neall
explores the many aspects of texture creation for the main character Geo. Some of these aspects include
techniques such as UVing, Projecting, Texture Painting using 2D and 3D software’s, as well as over-
views of shader and render setup. Ben also shows techniques to help the artist in the visual development
stage, using compositing software to make real-time decisions. The viewer will also see actual produc-
tion meetings in which the design and creation of the textures are discussed.

12. Gnomon Maya Texture Painting – Fundamentals

In this DVD, author Campion explains the essentials of texture painting with Adobe Photoshop, discuss-
ing how observation and an understanding of the original object’s surface qualities are the skills neces-
sary to create photorealistic textures.

Particle effects:
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13. Maya Fluid Effects Fundamentals
Understanding Dynamic Attributes
Fluid Emitters
Fluid Container Attributes
Menu and Options
Animation Techniques
Shading methods

14. Gnomon Maya Fluid Effects Pyrotechnics
This is MAYA fluid effect series teaching establishing and controlling a fluid, including dynamics, and vein effect-based method in common use from effect. It teaches you how to be put into use and keeps circumstances in fluid container under the control. This course also includes frame of system basis, makes an explanation how to use the MAYA fleetness and build effect effectively.

Lighting:

15. Digital Tutors Introduction to mental ray in Maya 2009
The course will study actual job technological process, it will carry out the accurate simulation on actual illumination, and it will explain that various type surfaces exaggerates and, this is high-performance to new function of mental ray exaggerating an implement carrying out all-round summary.

16. Lighting & Rendering in Maya: Lights and Shadows
. Step-by-step lighting of full Maya scenes
. Simulated radiosity style lighting for realism and speed
. Every kind of Maya light and shadow explored in depth
. Hacks, tricks, cheats, and creative uses for light attributes
. Practical approaches to professional-looking color choices
. Ray-traced shadows: how to optimize them and control their appearance
. In-depth guide to fixing different kinds of shadow artifacts and light leaks
. Mental Ray controls in lights, shadows, shaders, and render settings

Rendering:

17. I3D Tutorials Introduction to Hyper shade In Maya 2009
This tutor mainly introduces shading and surfacing technologies in MAYA, and how to use hyper
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shade, in order to improve work efficient.

18. Digital Tutors Render Passes In Maya 2009
Learn a production workflow to the completely updated Render Pass feature set in Maya 2009. Gain precise control over render outputs and learn timesaving techniques to optimizing the interoperability with Maya and compositing applications such as Toxik.

Magazines

19. 3D Creative Magazine
Zoo Publishing and 3d total publish this 3D magazine. It includes news, comments, interview, and tutorials of computer graphics industry.

20. Photoshop Creative Issue
Photoshop Creative provides Photoshop users with lashings of practical advice and inspiration.

It aim is to provide you with the best possible resources to help you develop your skills.

Online documentation

A Downloadable PDF Magazine for CG artists around the globe, 2DArtist magazine focuses on techniques, tutorials, interviews, articles, project overviews and galleries. We intend for our magazine to become a timeless resource for artists, which they can come back to again and again for inspiration, tips and tricks of the trade.

22. www.chinavisual.com
This Chinese website show China’s awesome artist and their works, it also include some design elements which I can use for free and introduce some good design websites.

23. www.cgstalk.com
From this website I can see the world most fantastic CG works. And I can discuss problems with CG professional workers around the world on this website. Some CG works on this website are really fantastic.

Project Description:

It will be very detail modeling of characters and I will make them as real as possible in Chinese looks. Particle will be used to create environment atmosphere, such as smoke, the smoke of gunpowder, clouds, leaves fall down. I will Use nCloth function to show figure’s ancient attire.
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This project can be used to reproduce a historical story in a museum or a movie trailer. I will use six months to accomplish this project, including character modeling, particle special effects, and simple animation, and title and end motion graphics.

The story is about an ancient Chinese hero being trapped by enemies. His wife does not want to be his burden, so she committed suicide even if she loved him very much. Eventually, he is still trapped by enemies in “Wu Jiang” river, he felt so depression, he killed himself finally.

APPROACH:

1. DESIGN: This 3D motion graphics piece will give visual experience to the people so that they can understand this Chinese ancient story easily. I am planning to make a 2-3 minute long motion graphics piece, which incorporate 3D and 2D animation techniques. The graphical part will show the story telling animation with images, which will be taken from historical books. In main part I will use my own characters.

There are two main characters in my project, one is the hero “XIANG YU”, the other will be his wife “Yu Ji”.

Subjects or participants:

Male / Female: Both
Age: 16-35
Education Level: Above high school

The primary target audience of my project is the people who are interested to learn about Chinese culture.

2. Computer Graphics: My project will be a 2-3 minute motion graphics piece. I will create this piece in Maya, Mudbox, After Effects, Illustrator, and Photoshop.

3. Procedure: I will go through history books, articles, movies, museums, websites that are related to the event.

This project will include 3D character modeling, which will have very details. And I will apply nCloth and particle effects to my project. Particle will be used to create smoke, fire, clouds, leaves fall down. Lighting will be used to create sunset looking and sadness atmosphere. Motion graphics will be used to introduce historical story.

I will use advanced 3D graphics technology and combine traditional Chinese culture, such as Chinese ancient clothing, hairstyle, armor shape, figure’s looking, environment setting and so on. First, I will do research, find some historical document recording and figure pictures to define my character’s appearance. Then I will use Maya particle effects, for instance fire, smoke, and cloud. I will use nCloth to form
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my figure’s clothing and using fur to create his/her hair and beard. Then draw the whole project’s story-board. After that, start to model my character, apply the effects on it. At the end, put more details on it.
I will take approximately six months to finish my project.

4. Technology:
Software Requirements:
Autodesk Maya
Autodesk Mudbox
Adobe After Effects CS4
Adobe Illustrator
Adobe Photoshop

Hardware Requirements:
Macintosh G5
IBM Compatible PC with at least a Pentium IV processor
Windows VISTA or Windows XP Professional
500 MB free disk space and 128 MB main memory

Examples:
Here are some reference images of the styles I am planning to incorporate in my artwork. My visual style would be more towards 3D graphics.
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IMPLICATIONS OF THE RESEARCH:
The power of motion graphics is infinite. Due to time constraints I will be forced to narrow down my topic into an event. Without using elaborate typography and voiceover but at the same time to make it visually interesting and giving a learning experience to viewer.

MARKETING PLAN:
For marketing, I plan on showing my work at museums and exhibitions in America and other English speaking countries. Apart from that, I will send my piece into different competitions and websites like motionograpser, cpluv, siggraph.
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