

Rochester Institute of Technology

RIT Digital Institutional Repository

Theses

1-2014

3D Illustration of Environments from the Chinese Legend "The Journey To The West"

Fei Gao

Follow this and additional works at: <https://repository.rit.edu/theses>

Recommended Citation

Gao, Fei, "3D Illustration of Environments from the Chinese Legend "The Journey To The West"" (2014). Thesis. Rochester Institute of Technology. Accessed from

This Thesis is brought to you for free and open access by the RIT Libraries. For more information, please contact repository@rit.edu.

Graduate Computer Graphics Design MFA Program
School of Design
College of Imaging Arts and Sciences
Rochester Institute of Technology

3D Illustration of Environments from the Chinese Legend “The Journey To The West”

by Fei Gao

A Thesis submitted to the Faculty of the College of Imaging Arts and Sciences
in candidacy for the degree of
Master of Fine Arts
MFA Computer Graphics Design
Rochester Institute of Technology

January, 2014

Approvals

5/22/14

Chief
Adviser

Daniel DeLuna
Department of Computer Graphics Design
School of Design

Date

5-22-14

Associate
Adviser

Marla Schweppe
Department of Computer Graphics Design
School of Design

Date

5/22/14

Associate
Adviser

Shaun Foster
Department of Computer Graphics Design
School of Design

Date

5/22/2014

Administrative
Chairperson

Associate Professor Peter Byrne
School of Design
College of Imaging Arts and Sciences

Date

Table of Contents

Abstract	1
Problem Statement	3
Process	5
Conclusion	25
References	27
Thesis Proposal	29

Abstract

The authors' "Illustration of Mathematics from the Chinese 'Jiuzhang Suanshu' (Nine Chapters on the Art of Mathematics)" reflects the spirit of inquiry of the mathematics.

Abstract

This paper is divided into two parts. The preceding part discusses the historical background of the Chinese mathematics, and the following part discusses the historical development of the Chinese mathematics. The first stage of the project is to investigate the historical background and the development of the Chinese mathematics. The second stage is to investigate the historical development of the Chinese mathematics. The project is divided into two parts. The first part is to investigate the historical background and the development of the Chinese mathematics. The second part is to investigate the historical development of the Chinese mathematics. The project is divided into two parts. The first part is to investigate the historical background and the development of the Chinese mathematics. The second part is to investigate the historical development of the Chinese mathematics.

Keywords:

Chinese Mathematics, History of Mathematics, Education, Mathematics

Abstract

The project “3D Illustration of Environments from the Chinese Legend ‘Journey to The West’ ” explores the use of modern digital techniques, to reveal the look of traditional Chinese elements in both a realistic and creative way. This project is broken into two parts: the modeling, texturing and lighting section where most originality and restoration occurs; and the animation part illustrating the final result of the combinative exploration. The first stage of my project investigates developing interior and exterior scenes that illustrate two totally different atmospheres. The main focus of the project is on creating detailed and realistic-looking objects, which allows the audience to be immersed in both ancient and mystical Eastern environments. This project requires mainly Maya and Mudbox for modeling and animation, as well as After Effects and FinalCut Pro for the final video rendering. The resulting products are two short films with camera flying through realistic detailed scenes.

Keywords:

Chinese Traditional Culture, 3D, Illustration, Effective Communication

Problem Statement

I think lots of people know about the "Monday Blog" and many check in on the blog all throughout school and after. At the very least, I know you

Problem Statement

and the world would look like in the current time, and other resources... (text is very faint and illegible)

My process included researching both for initial and further aspects... (text is very faint and illegible)

Problem Statement

I think lots of people know about the “Monkey King” as a main character in the classical Chinese epic novel Journey to the West. It has been one of my favorite novels since I was young. While reading the novel, I imagined what the world might look like in the ancient time, and what creatures might exist in that mysterious land. I have been inspired by some great 3D artists, such as Javier Leon, who maximizes the power of 3D techniques by creating stunning work. 3D technology currently plays a great role in many fields, especially in commercials, games and movies. Despite the fact that it enhances visual effect and allows more creativity, it is also an economical and eco-friendly way to avoid building up real scenes. The final result would be two short films which showcase two convincing and intriguing scenes.

My process included considering both technical and aesthetic aspects for the two animations. I would first apply my 3D knowledge modeling all the objects, by referencing various sources and my own imagination based on the novel. The second part of the process focused on sculpting the details of the objects, and setting up lights to demonstrate the right atmosphere. For better representing my final project, learning proper animation techniques was a must. By referencing techniques from great cinematography, I learned to control the cameras to show the scenes in a smooth and coherent manner.

Process

1. Research, Planning and Sketching

One. They represent two totally different atmospheres.

Process

The novel "The Journey To The West" was written in the 16th century during the Ming Dynasty, but there is still no certain period existing exactly when it took place. Furthermore, according to Wikipedia, the novel is "a fictionalized account of the legendary pilgrimage to India of the Buddhist monk, and loosely based its source from the historic text Great Tang Records on the Western Regions and traditional folk tales". Thus, it gives me quite a large space for being creative.

Unlike most western brides would wear white wedding gowns on their big day to symbolize virginity, since 19th century when Queen Victoria made this popular, in traditional Chinese culture, however, people set the color red as symbol of auspiciousness and good fortune, especially celebrations and festivities. The preference for red of Chinese people is fully reflected in a traditional Chinese wedding: the bride would wear a red wedding dress with exquisite embroidery and decorations of beads, with a intricately detailed phoenix coronet and a red veil under to cover her face during the ceremony; the wedding room would be decorated with all kinds of red objects, such as red lanterns with paper-cuts of double happiness, as well as red "no-pain banner", with rhythmic lyrics praising the couple a perfect marriage, are usually decorated on both sides of newlywed's doors, etc. I was happy about finding out so many objects could be included in my wedding room scene, with color red to be the dominant ones.

As for the second scene "The Dragon Cave" - a natural exterior scene with a mythical creature, adds excitement but also more challenges into the project. Dragons exist in both Western and Chinese cultures, yet

Process

1. Research, Planning and Sketching

There are two scenes of my project—the Wedding Room and the Dragon Cave. They represent two totally different atmospheres.

The novel “The Journey To The West” was written in the 16th century during the Ming Dynasty, but there is still no certain proof explaining exactly when it took place. Furthermore, according to Wikipedia, the novel is “a fictionalized account of the legendary pilgrimage to India of the Buddhist monk, and loosely based its source from the historic text Great Tang Records on the Western Regions and traditional folk tales”. Thus, it gives me quite a large space for being creative.

Unlike most western brides would wear white wedding gowns on their big day to symbolize virginity, since 19th century when Queen Victoria made this popular, in traditional Chinese culture, however, people see the color red as symbol of auspiciousness and good fortune, especially celebrations and festivities. The preference for red of Chinese people is fully reflected in a traditional Chinese weddings: the bride would wear a red wedding dress of exquisite embroidery and decorations of beads, with a intricately detailed phoenix coronet and a red veil under to cover her face during the ceremony; the wedding room would be decorated with all kinds of red objects, such as red lanterns with papercut of double happiness, as well as red “happiness banners“, with rhythmic poem praising the couple a perfect marriage, are usually decorated on both sides of newlywed’s doors, etc. I was happy about finding out so many objects could be included in my wedding room scene, with color red to be the dominant tone.

As for the second scene “The Dragon Cave”-- a natural exterior scene with a mythical creature, adds excitement but also more challenges into my project. Dragons exist in both Western and Chinese cultures, yet

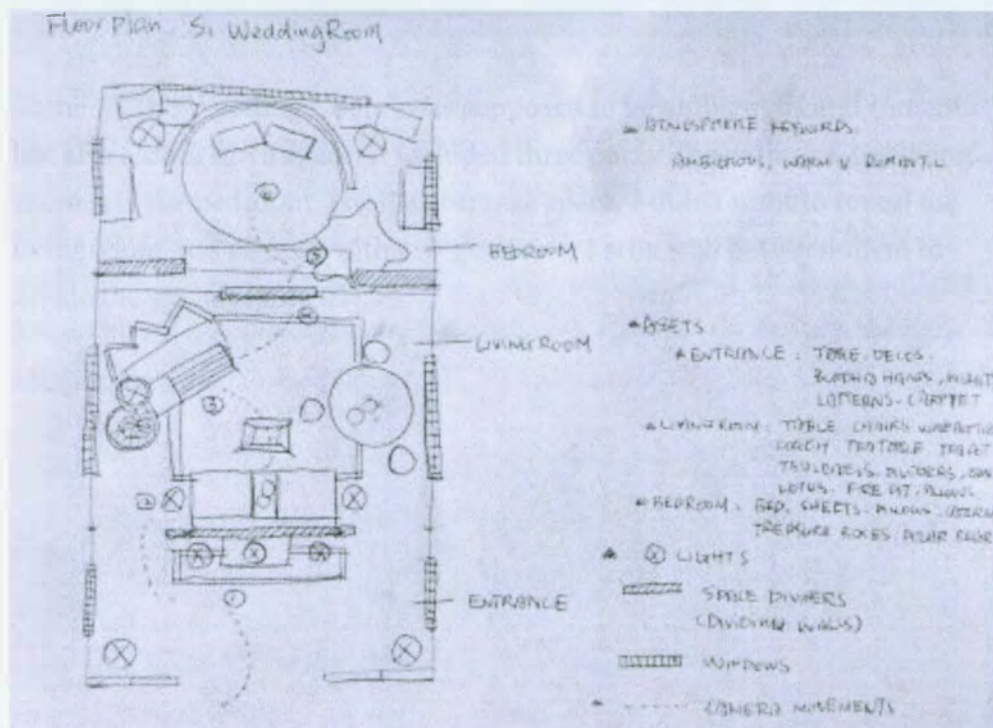
Process

the difference between them is extensive. Western dragons, are often portrayed as evil and greedy creatures which bring harm, suffering and fear to human beings, such as Smaug, one of the most well-known dragons from "The Hobbit". He is described as "a most specially greedy, strong and wicked worm". In China, however, the dragon is the symbol of nobility, strength, wisdom, good fortune and power over the elements of wind and water, which also often appear in Chinese festivals, celebration and weddings. In Journey to the West, the Monkey King traveled all the way to the East Sea, trying to obtain a powerful weapon which belongs to the Dragon King. Thus, I planned to set this scene within a dark and gloomy environment, in order to enhance the suspenseful and mysterious feeling of it, also as a contrast to the wedding room scene.

Planning and Sketches

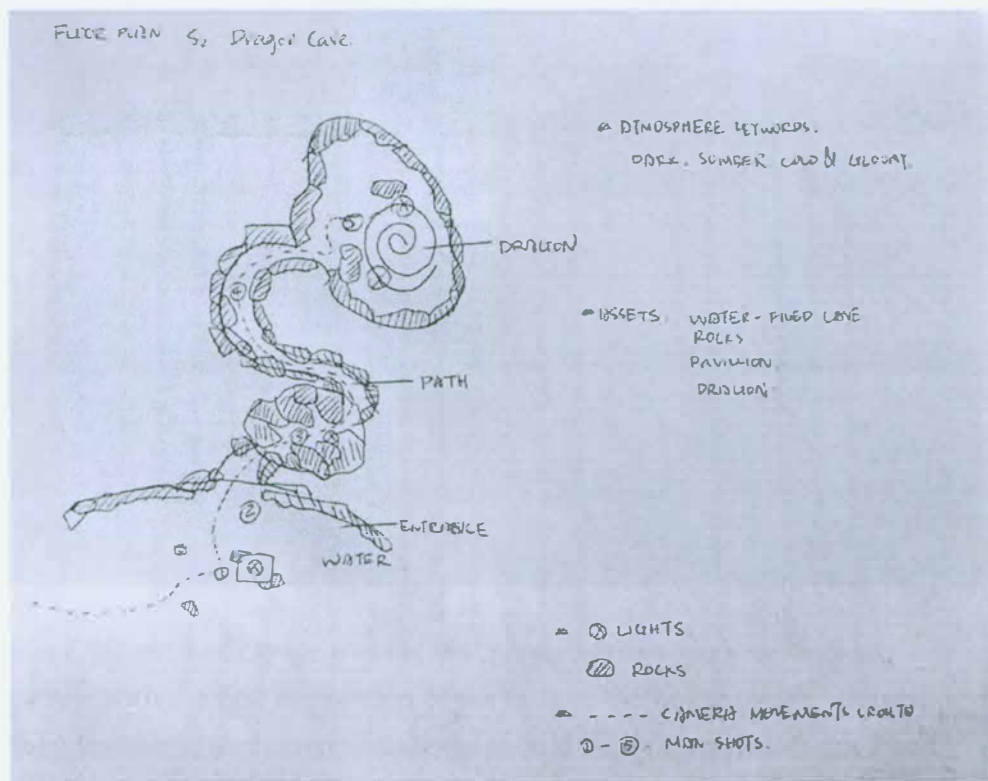
The next step was to map out the floor plan, space division and a list of main objects for both scenes. (Figure 01)

Figure 01A
Floor Plan & List
of Objects for the
Scene 1: Wedding
Room



Process

Figure 01B
Floor Plan & List
of Objects for the
Scene 2: Dragon
Cave



Scene 1 "The Wedding Room" was supposed to be ambiguous and romantic, but also a sleek open space. It included three parts: The entrance, the living room and the bedroom. For the entrance space, I didn't want to reveal the living room too directly with one glance, so I set a wall between them to divide the space (Figure 02).

Process

Figure 02
Rendered Image:
The Entrance Wall

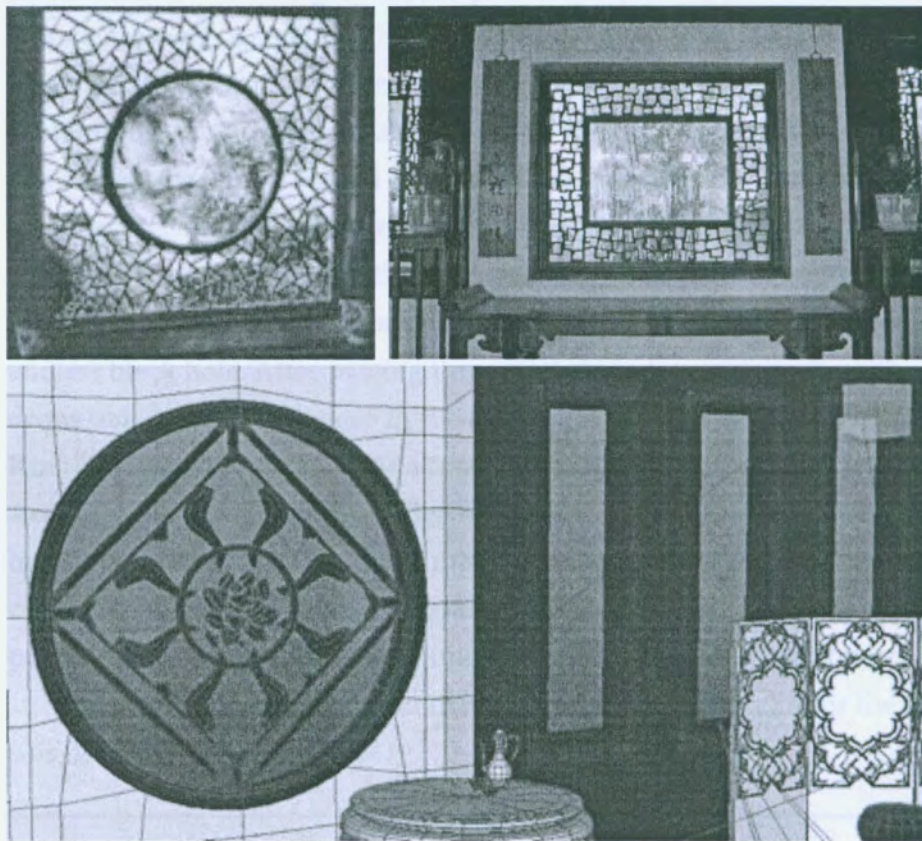


Since the entrance space was the first area where guests step in, it hit people with the first impression of the taste of the house owner. Thus, all the furnishings and ornaments there should be elaborately designed and displayed. I set a simple and elegant console table in center, with an incense burner and two decorative Buddha hands on top, which were two of the most common symbols of reverence and respect for the Buddha. There is one important element when it comes to arranging a Chinese wedding room: big red lanterns with the Chinese character“囍(happiness)” on them. Red lanterns are not only used as practical entrance-way lighting, red lanterns are sometimes are highly ornamental, and a status symbol for grand celebrations such as weddings.

The living room included three parts: the couch for having guests, the dinning area, and a relaxing corner with musical instruments. The windows in the living room were inspired by the ones at ancient Chinese gardens, with highly ornamental frame, to give more interesting glimpses of the garden or scenery outside.(Figure 03)

Process

Figure 03
Windows of
Ancient Chinese
Garden & My
Own Design



In order to give the bedroom a little bit more privacy, I set a screen in front of the entrance to it, which also provides a partition off the living room and decoration. The wooden screen was exquisitely designed and decorated with love birds and flower patterns carved on them. Surrounded by two sophisticated -carved curvy screens, the round bed represented harmony and the blessing for the newly married couple. The scattered pillows and bed sheets added a flavor of being flirty and romantic for the room. The hidden jewelry boxes next to the bed implied the wealth of the owner of the house. The color scheme for the first scene was decided to be warm red as the main tone, mixed with few contrast colors.

Process

As for scene 2 “The Dragon Cave”, I planned to create a dark and somber atmosphere with a cool tone. The first thing that appeared in my mind was a misty lake with a crescent moon hanging in the gloomy sky. In the center of the lake, stood alone a pavilion with a lantern throwing out a dim flickering light. I could even smell the moisture in the air, which silently clinged to the tips of my hair. With the subtle ringing of a bell from a distance temple, there was the cave creeping on the shore motionlessly, it opened its mouth like a monster, like it could inhale anything into its endless black hole. After passing through the winding waterways with water drops ticking overhead, deep in the cave there hovered the drowsy Dragon King. Creating the dragon was a fun experience, since dragons doesn't exist. According to the reference I collected, a dragon is a combination of a camel head, deer horns, tiger whiskers, rabbit eyes, bull ears, a pig mouth, eagle claws, and a snake body with fish scales, each part representing unique power of the animal: flying, swimming, running, sneaking, and other strength that can help survive in nature. Thus, the sketch I did for the dragon was based on that. (Figure 04)

Figure 04
Sketches of
Dragons



Process

As for the color, I decided to give it a tint of purple to amplify the gloomy feeling of the cave, as well as noble taste. Apart from the fact that the dragon was the highlight of the second scene, the design of the stony path was also one of the essential parts of completing the story. In order to create anticipation for later revealing the dragon inside, I specifically planned the path with winding twists and turns.

In the end of the floor-planning section, I mapped out two rough routes of the camera movement for both scenes, which also gave me ideas of arranging the objects in order to show well-balanced framing. I realized that good planning definitely helped me launch the following work more efficiently and methodically.

Before I started working on the computer, I chose the proper software for my project: Autodesk Maya for modeling, lighting and rendering; Mudbox for detail sculpting; Adobe Photoshop for creating patterns and textures; After Effect and FinalCut for final animation composing.

2. Modeling and Composition

Modeling

First, I had the list of the objects that I created before with me, which helped me keep track of timing without missing anything. I also did research about different modeling procedures, so I could find the most suitable method for my case.

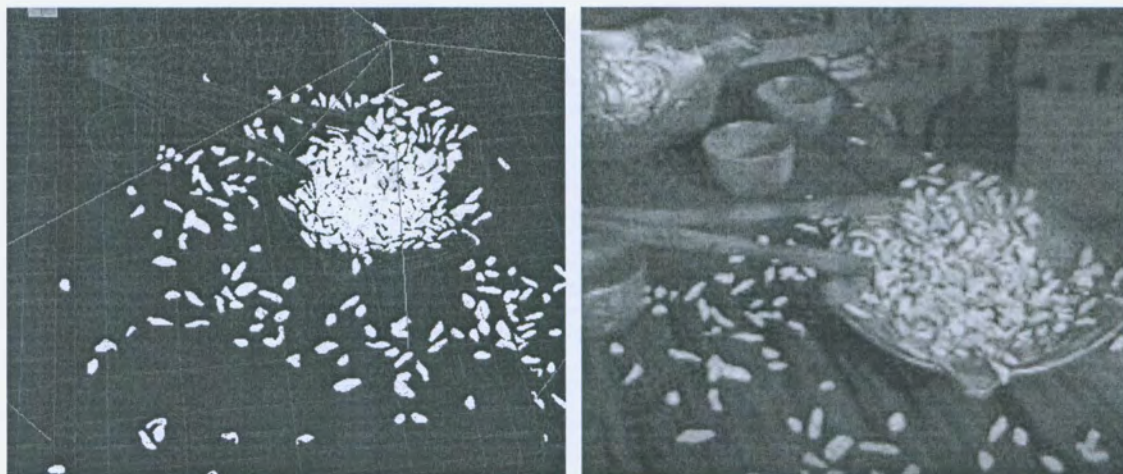
Based on the list and sketches I had, I separated all the items into two parts: the organics and inorganics. For organic items, such as the dragon, rocks and the lotus, I found using polygons is more flexible and user-friendly. While

Process

when it came to the inorganics, for example vases and furnishings, nurbs has its own advantage: it's much easier to deform than polygon meshes and it's less memory intensive. Another technique I used to be more efficient in the beginning stage of modeling is that if I didn't have an inorganic concept 100% settled, or yet receiving any feedback, I kept the geometries with nurbs. Once everything was good enough, I converted nubs to polygons and took care of the details with polygons.

Everything went well until I hit my first obstacle: creating randomly scattered leaves on the table. There was no way to place them piece by piece, not to mention applying textures on them manually. I remembered taking sub-d modeling class with Professor DeLuna before, when he taught us modeling with animation tools, or even using paint effect. Inspired by that, I decided to use particles. I found that Maya's particle instancing feature saved me time since I had to animate many identical objects in a scene. In my case, I created four leaves as my source geometries and applied different shades on them, by controlling the different parameters in the attribute editor of the particles, and using code in the expression editor. After I was satisfied with the look of the leaves, I deleted history and finally archived the good result I wanted. (Figure 05)

Figure 05
Modeling and
Rendered Images
of Scatted Leaves



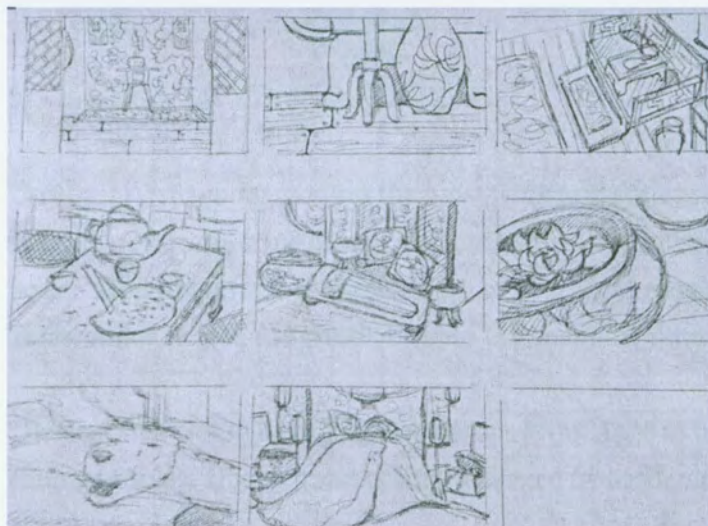
Process

Apart from the lotus in the living room of the first scene, the only other two organic objects were the polar bear rug and the dragon. The polar bear head took me some time to create with the reference pictures I collected. I learned a lot about fur: from controlling its attributes, to using 3D Paint Tool creating customized look. As for creating the dragon, I relied mostly on my own imagination and the sketches I did earlier. The default polygon cube was used for the basic shape, then it was deformed through different functions in Maya, such as extrude, merge, combine, etc. The key point in this step was to create the polygon model using a minimal amount of meshes, which kept the later step—UV Mapping easier and less render time consuming.

Composition

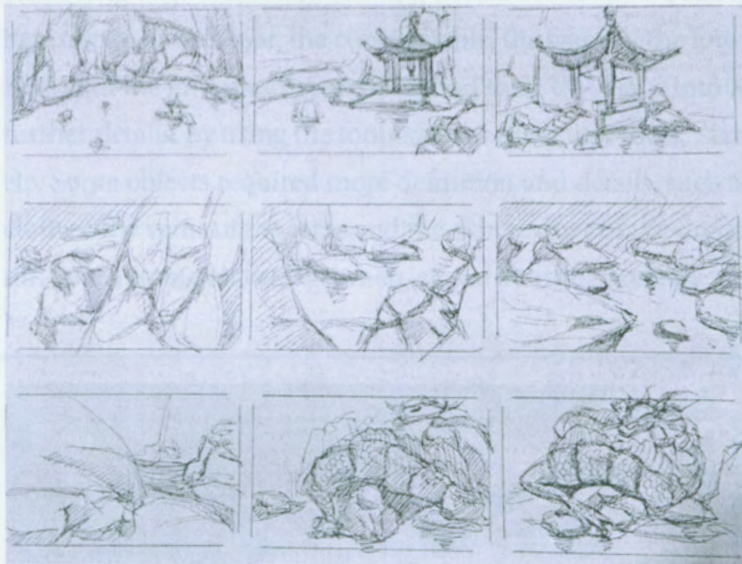
Good composition and staging are key points in any compelling professional image. In effect, they act as subtle cues from the director, helping guide a viewer's eye. Before I started working on the details of the objects, I had to think about the composition and staging of the scenes, so I could focus on the hero objects for future sculpting and texturing. Based on the floor plans and sketches I had, as I positioned all the items in the scenes, I created a storyboard including all the cuts and the paths of the camera movements. (Figure 06)

Figure 06
Storyboard



Process

Figure 06
Storyborads



Basically, I broke down the scenes shot by shot and decided what would be in focus, and what needed to be modeled with heavy geo and what could be low res with only displacement or bump maps. The render test results kept me going back and forth revising and improving the compositions and staging of the scenes, by optimizing the set-up of the cameras and repositioning the items. Since I had no experience of cinematography, I gathered feedback from not only my committee members, but also my classmates and friends from photography majors.

3. Sculpting, Texturing and Shading

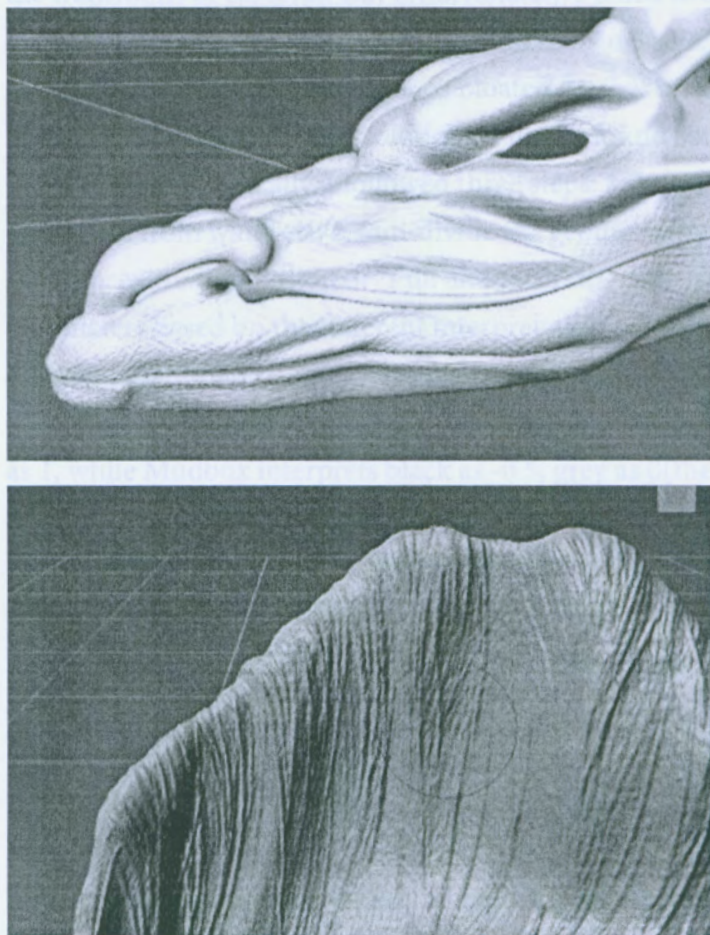
Usually, UV mapping requires the most work and patience in the 3D workflow, since it's quite time-consuming. Fortunately, with the help of Professor Shaun Foster, I found useful tool within Maya to help me through: the Maya Bonus Tools, which helped me greatly by auto UV mapping multiple meshes.

The next step would be improving low-res geometries to high quality models for realistic visuals. This step was mainly achieved by hardening the edges of shapes

Process

via adding edge loops, and creating details in Mudbox. I started with hard-surface items, such as the floor, the console table, the teapots, the lotus jar and the rocks. I brought the low-mesh geometries and their UV maps into Mudbox for creating further details, by using the tools such as the sculpt tools, stamps and stencils, etc. Some objects required more definition and details, such as the creases on the clothes, the veins of the lotus and the skin texture of the dragon, so I spent more time on creating realistic geometries and painting textures in Mudbox. (Figure 07)

Figure 07
Sculpting Dragon
Head & Fins in
Mudbox



In the end of this step, I generated all the color, specular, normal and displace maps for future use in Maya.

Process

Then, I collected all the low-res geometries in Maya and started applying maps on them. I found it quite amazing that Mudbox did a really good job of creating color and specular maps, which saved me a great amount of time correcting and recreating textures in Photoshop. While working with the bump map in Maya was little bit more challenging. Being aware of the difference between normal and displacement map, I set them as different layers while sculpting in Mudbox: the normal map focused on the details of textures, while the displacement showed the real geometries without worrying about the transitions of cameras. But unfortunately, I failed to apply the generated displacement maps properly on the geometries in Maya. The errors were usually unwanted cracking edges or bloated meshes on the objects. After spending time searching for solutions, I finally found some helpful information in a CG forum. Basically, I followed three steps: 1. Input the low-poly mesh into Maya from Mudbox; 2. Sub-divide the geometry by using mental ray Approximation Editor; 3. “Pull and push” the points by adjusting the parameters based on the different interpretation between Maya and Mudbox. I learned that Mudbox and Maya reads the black and white displacement map differently. Maya reads the black value as 0(the surface), grey as 0.5 and white as 1, while Mudbox interprets black as -0.5, grey as 0(the surface) and white as 0.5. That explained why my mesh was ballooned up undesirably. In order to fix this, I used the expression “=fileName.alphaGain*-0.5” to make the value of Alpha Gain and Alpha Offset to sync relatively to each other. I finally reached my desired outcome by adjusting the parameters in the correct way.

Since there were so many objects in both scenes, I had to think carefully about optimizing to save on resources. Thus, as for this stage of my workflow, I used procedural shading for the less important objects in the scene, and reduced the file size of the maps of the distance objects, or converted the format into MAP to be more resource-efficient.

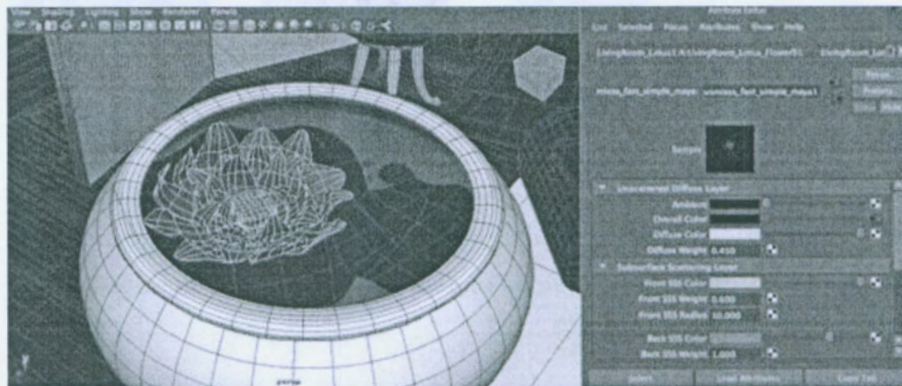
Process

4. Materials

Materials define how the surface of 3D objects appear and lend them color, transparency, and texture that allow us to view the characteristics of a surface. Since I had a big amount of objects in both scenes, it was challenging to distinguish them enough, in order to achieve the best realistic result. The materials in my scene mainly were: wood, paper, ceramic, metal, water, skin and rocks. Blinn is usually quite ideal for wood and rough metal objects; phong is good for glass, water and reflective metals; and lambert is being used on paper, cloth and things that aren't reflective. The advantage of lambert is that it doesn't have highlights and reflections, and phong has more control options for highlights than blinn for better representation of highly reflective surfaces.

In my first scene, I placed a ceramic bowl with a lotus inside on the wood floor, with a screen made of wood in the background. I chose phongE with a high specular value, as well as low highlight size and roughness. And I also turned the ray-tracing on because it was a reflective object. For the wood floor and screen, I used lambert material since they don't have highlights and reflections. For the petals of the lotus, I found the petals challenging because they were relatively thin layers of cells and so were strongly transmissive. For translucent materials like that, I used Subsurface Scattering shader with diffuse color, specular and bump map on it. (Figure 08)

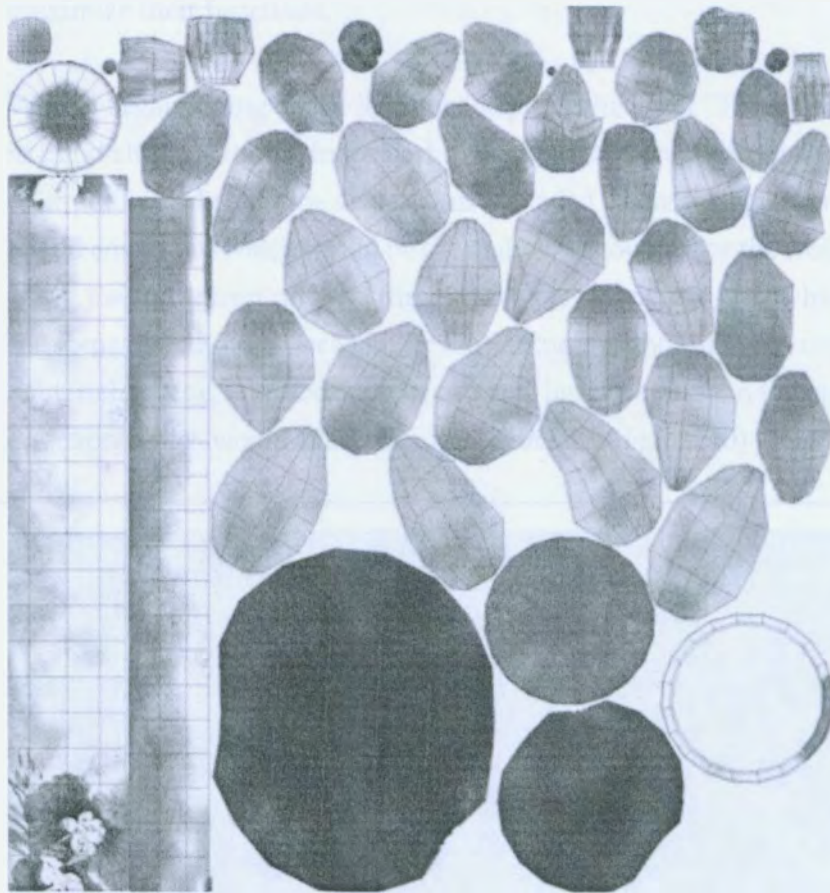
Figure 08
Subsurface
Scattering Shader
Attributes of
Lotus



Process

A better, more 'physically accurate' method was to add a small amount of thickness to the geometry by extruding the petals. After finishing modeling and UV mapping for the petals, I painted the petal texture in photoshop and applied it on the diffuse color node. (Figure 09)

Figure 09
Painted Texture of
Lotus



The lotus was lit with a directional light pointing towards the camera, thus creating the translucent backlighting effect for the petals. As for the rocks and dragon scales in the second scene "Dragon In The Cave", I noticed that objects seem more shiny and wet in the moon light. Therefore I intentionally cranked up the highlight and reflection value to achieve this effect.

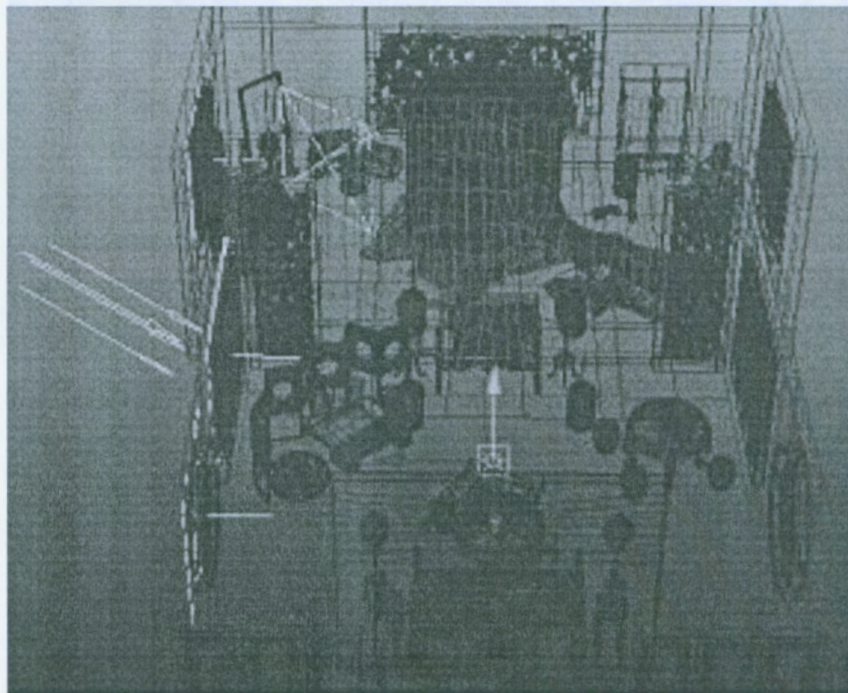
Process

5. Lighting

I chose mental ray when it comes to lighting and shading in Maya, since it's ideal for high quality and photorealistic rendering result. Since I had two big scenes to render, it's very important to control the amount of lights and maximize their functions.

When I began setting up the lighting, I kept the theory of "Three-point Lighting" in mind always. I started in the darkness and made sure there was no default light or any ambient light in the scene. Then I decided where the environment light would enter, and which would be the main light source. For the wedding room scene, I set one direction light, three area lights and point lights, which affected the scene directly. In order to fill up the darkness slightly and add some bounced light in the scene, I created another two area lights pointing in the opposite direction, which would affect the room indirectly. (Figure 10)

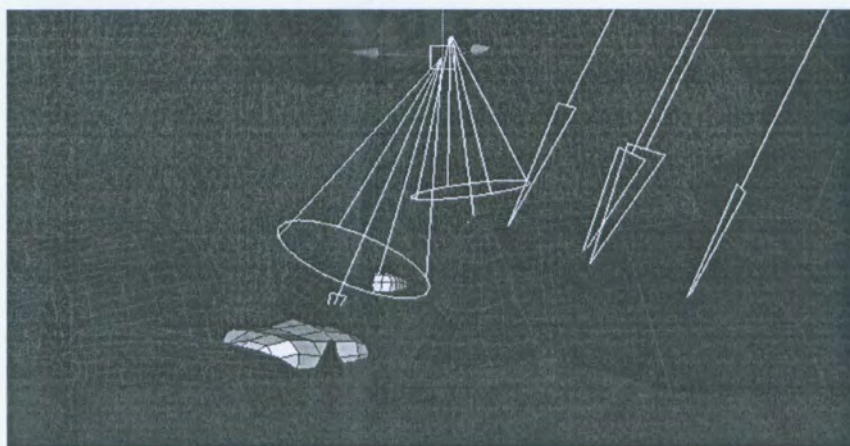
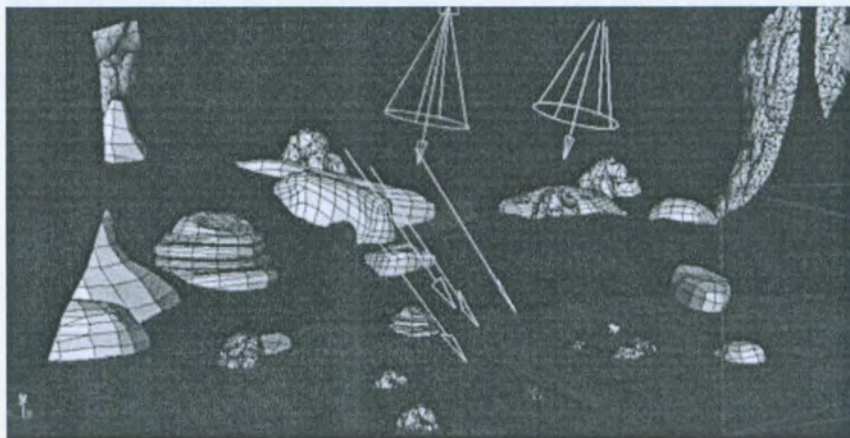
Figure 10
Basic Lighting
Setup in the First
Scene



Process

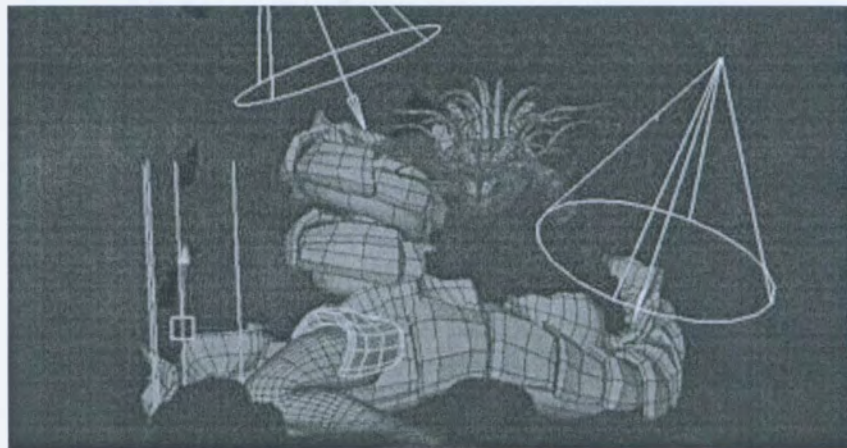
As for the dragon cave, the same general principles that suit lighting a day time scene also applied to a night time scene. I replaced the sunlight with a much dimmer moonlight by adjusting the brightness of the direction of the area light accordingly. Since moonlight is less intense than sunlight, there won't be much bounced light in the scene, which means the shadows would be darker and sharper. I decided to use depth map shadows which created a fairly crispy affect and also wouldn't take long to render. Instead of making the whole scene too dark, I cranked up the contrast between lit ares and shadowed areas in the scene. Even though the shadows were dark, they should be almost, but not totally black because there was always some light partially leaking through. I also casted spot lights on certain rocks and the dragon for highlighting purposes. (Figure 11)

Figure 11
Basic Lighting
Setup in the
Second Scene



Process

Figure 11
Basic Lighting
Setup in the
Second Scene



Additionally, since the human eye loses its sensibility and has to adjust to the darkness, I made sure that the colors in the night scene should be more muted and desaturated.

In order to simplify the control of so many lights and objects, I found using light links be very helpful. One of the benefits of working with Maya was that I could ignore certain laws of physics, such as “A light illuminates everything it touches”. With maya, I was able to decide if an object would be illuminated or not by connecting and breaking the light links, this feature helped conserve resources.. For example in the dragon cave scene, the inside of the cave was gloomy and dark, so I wanted to have some moon light casting on some rocks along the camera movement path. I used 3 spot lights on top of the rocks that I wanted light up, and linked and named them correspondingly under light links attributes. Using the light links feature, I got a clear look of all the lights in the scene, also made sure the lights were each performing their intended functions.

Process

6. Animation & Rendering

Animation

My thesis project had two very basic camera fly-through animations which allowed the audience to see the scenes in great detail. By referencing the path map I created in the planning stage, I found it's easier to make two motion paths by using EP curves. On path A, I attached an object (later it would turn to invisible) for the camera to aim at throughout the animation. And the camera itself would follow path B. I created the path A in the top view, and made sure that it covered all the objects that I wanted to aim at later. Then I created a camera and aim, and parented the aim onto the object on the path A. This way, it was easier for me to control the aiming by simply adjusting the points on curves, and avoided confusion with all the attributes of the camera turing and rotating. I applied the same techniques on all the cuts and named the cameras correspondingly. Since there were an indoor and outdoor scene with two totally different atmospheres, the camera settings had to be different, in order to show the depth of the environment. By looking through the cameras, I controlled the attributes of focal length and angle of view to make this difference. For example, in the wedding room scene, I positioned the camera at the level at the average human eye level. I used a basic 35mm camera, which is similar to the human eye to make the viewers feel like they are inside of the space as the subjects. As for the other the dragon cave scene, I used a wider angle camera to include more objects and also made them seem bigger and more imposing. Compared to the warm and festival feeling of the wedding room, the cave scene was supposed to be dark and creepy. Thus, I set the camera in a lower angle below the eye line and looking up, like it was crawling on the ground. I found that a low angle shot made that the surrounding environment and the dragon seemed even more powerful and intimidating. In the mean time, I found free music online while doing the animation and cuts, so it would be easier when it comes to final compositing later.

Process

Rendering

To achieve ambitious 3D renderings with the desired complexing, quality and speed, rendering in multiple layers or passes was necessary. This was then finished through compositing for the most efficient professional workflow. This strategy not only allowed more creative control, but also rapid modification of shots if needed. Another main benefit was this technique avoided slowing down the computer when rendering huge projects. Basically, I separated all the objects in the scenes into the foreground and background layers. By doing this, it gives me more control of creating the depth of field by slightly blurring the background layers and makes the main characters stand out more. Whereas rendering in layers only means rendering different objects separately, rendering in passes isolates different attributes of the scenes. In my case, I chose to render the diffuse, specular, reflection and shadow passes for the foreground main objects. For the background items, I rendered only beauty passes. And for all the objects in both scenes, I rendered occlusion passes, which provided a great replacement for very soft fill lighting, as well as added weight to the scene and slightly darken the corners.

7. Compositing & Final Refinement

After all the layers and passes were rendered, I imported them all together into After Effects for post-compositing. I slightly blurred the background and color-corrected any of the passes as needed, etc. In order to reinforce the mood for both scenes, I added some special effects such as smoke and subtle light glows in After Effects. The last step was to put the two final videos and chosen music all together into FinalCut for final compositing.

Conclusion

Contents

Conclusion

...the same words I would use to summarize some of the process of production, either technically or artistically. Technically, low- and high-speed modes were chosen with a certain effect, by using the detailed material features and thoughtful parameters of finishing conditions. Technical treatments of lighting systems were applied that to achieve a certain effect at a certain time. The process of rendering, there are a number of ways to support the original and experimentally by rendering separate layers or a piece. As for the given situation, you need for the surface and concrete products of rendering, preparing the proper material and concepts, even an hybrid, as a good idea and right choice. Generally, I would like to say that producing and rendering of volume and texture is a very long technical and artistic process, a very long and necessary learning stage of a professional architect, but also the key of finishing the expected objects in time. During the process of production, I make sure that what they was completed recently and I always take the experience of other architects, members or passed through the same situation. In a very good and bad way, I would say. Through the experience of developing the these process, not only it created the ability of self-management and self-learning during the entire production, but it also helped me to develop some solutions, this can certainly be said that there should be a future professional design.

25

Conclusion

Conclusion

It took me three quarters to finish my pieces and I am quite satisfied with the final result, with all expected goals reached through my continuous trying and extensive studies. There are some points I would like to summarize about the process of production, either technically or artistically. Technically, low-res but high-quality models were created with realistic effect, by using the detailed-painted textures and thoughtful parameters of shading attributes; Diverse treatments of lighting set-ups were applied due to different atmosphere of scenes; The amount of rendering time and computer resource were well arranged and apportioned, by rendering separate layers and passes. Artistically, great attention was paid for the design and cinematic principles of balanced compositing; Proper mood and atmosphere was set by well-composed shots and right music. Generally, I learned that setting prior planning and research of realistic and adequate goals both technically and time wise is not only the necessary beginning stage of a professional workflow, but also the key of reaching the expected objectives on time. During the process of production, I make sure that each step was completed properly and I always took the audiences' (either committee members or peers) feedback into consideration and integrated it into work if needed. Overall, the experience of developing my thesis project not only showcased my ability of self-management and self-learning during the entire workflow, but it also helped me develop into someone who understands herself better about future positions in design.

References

Interiors &
Furniture Design

Chinese Houses: The Architectural Heritage of a Nation
by Ronald G. Jonathan Spence, & Chester Ong

Chinese Furniture: A Guide to Collecting Antiques
by Chester Ong

Javier León's Blog
<http://www.leoncarillo.blogspot.com>
by Javier León, CGA® Director

Petecado Vimeo Channel
<https://vimeo.com/petecado>
by Petecado

Area Digital: Inter-tainment & Visualization Community
<http://area.intodesk.com/>
by Intodesk

Digital Lighting and Rendering (2nd Edition)
by Jeremy Birn

References

Interior &
Furniture Design

Chinese Houses: The Architectural Heritage of a Nation

by Ronald G, Jonathan Spence, A. Chester Ong

Chinese Furniture: A Guide to Collecting Antiques

by Karen Mazurkewich, A. Chester Ong

3D Art

Javier Leon's Blog:

<http://javierleoncarrillo.blogspot.com/>

by Javier Leon, CG Art Director

Peteando Vimeo Channel

<https://vimeo.com/peteando>

by Peteando

Area Digital Entertainment & Visualization Community

<http://area.autodesk.com/>

Autodesk

Digital Lighting and Rendering (2nd Edition)

by Jeremy Birn

Thesis Proposal

Thesis Proposal for the Master of Fine Arts Degree

By Mrs. T. M. M.

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF FINE ARTS

1955

SCHOOL OF FINE ARTS
UNIVERSITY OF CALIFORNIA
BERKELEY, CALIFORNIA

Thesis Program
3D Miniature Environmental Design of Chinese Novel "Journey To The West"
Fei Gao

Thesis Proposal for the Master of Fine Arts Degree

Fei Gao
Rochester Institute of Technology
College of Imaging Arts and Sciences
School of Design
Computer Graphics Design

Title: 3D Miniature Environmental Design of Chinese Novel "Journey To The West"
Submitted by: Fei Gao
Department: MFA

Keywords:

Thesis Proposal for the Master of Fine Arts Degree

Why Miss The Story:
3D Miniature Environmental Design of Chinese Novel "Journey To The West"

Fei Gao

Rochester Institute of Technology
College of Imaging Arts and Sciences
School of Design
Computer Graphics Design

Approved by: Chair
Approved by: Advisor
School of Design

Thesis Proposal for the Master of Fine Arts Degree

Fei Gao

Rochester Institute of Technology
College of Imaging Arts and Sciences
School of Design
Computer Graphics Design

Title

Why Miss The Story:

3D Miniature Environmental Design of Chinese Novel "Journey To The West"

Submitted by

Fei Gao

September 29, 2010

Approvals

Chief Adviser

Date

Professor Daniel DeLuna
Computer Graphics Design

Associate Adviser

Date

Professor Marla Schweppe
Computer Graphics Design

Associate Adviser

Date

Professor Shaun Foster
Computer Graphics Design

Administrative Chair

Date

Professor Patti Lachance
School of Design

Situation Analysis

Abstract

Keywords:

3D Environment, Chinese Novel, Reading and After-reading experience

There are several ways to tell people a story: Through speaking, by conveying through images and books, or through film and animation. The common feature between them is that people must involved, no matter if they are the focus of the story or the audience. The characters lead the audience by experiencing the story. Because the audience has no personal perspective, they can't experience the story scene in the same way the characters can. However as a student majoring in computer graphics design and with the rich technologies of the CG world, we can make the "experience" happen in an entertaining visual way. The general topic area focuses on using 3d digital technology to create a miniature interior environment of two classic and well-known scenes of the Classic Chinese Novel "Journey To The West". The reason I chose this story as my thesis topic is because I think it would be interesting to bring an ancient Chinese novel to life by designing and representing all the interior elements in a new way, like modeling, texturing, lighting and rendering.

Situation Analysis

What prevents people from knowing a good classic story? Language limitation, different backgrounds, or tedious reading? Isn't it a pity if you miss a wonderful story because of those boundaries, which can actually be conquered?

While stories can be told in many different ways, in order to introduce Westerners to the traditional Chinese novel called 'Journey to the West', the incorporation of images will both quickly and simultaneously introduce them to the visual elements associated with the story, which are readily familiar to Chinese readers.

Problem Statement

How do we give people who are not familiar with traditional Chinese elements and this story a better general idea of when and where the story takes place with just a quick glimpse, even if they speak different languages and have diverse backgrounds?

Design Ideation

My design direction explores the use of 3D software, focusing on the process of modeling, texturing and lighting, to create two scenes of the story with cartoonish style but detailed and realistic textures. To make it look more dynamic, the camera will slowly fly through the scenes with different visual angles, and then focus on specific objects to give people a better understanding and visual satisfaction.

The final project will come out as two high-resolution rendered images per scene with a high level of complexity, and two short films about 30 seconds long each. As the images allow the viewers to enjoy the fine details inside of the scenes, the films also offer people a more general tour of living in an ancient magical world. Creating these assets in 3D software will not only provide audiences with more viewing angles to see enough details of the subjects, but also the opportunity to experience the feeling of interior and environmental spaces that existed during the time when the story takes place. By using design and 3D techniques, I aim to interpret the ancient story with a totally new look.

Situation Analysis

What prevent people from getting to know a good classic story? Language limitation? Different background? Or feel tedious of reading? Isn't it a pity if you miss a wonderful story because of those boundaries which actually can be conquered?

There are several ways to tell people a story: through speaking, by conveying through images and books, or through film and animation. While in today's world where information updates so often that many people do not have the patience or time to read a book, or even an article. It is true that with the arrival of "the picture-reading era" which is based on modern science and industrial technology, the hegemonic role of words is severely challenged. The "picture" here can be still images or consistent ones, which known as films or animations. To understand an artwork or animation, there is no limitation of languages and no specific requirement of educational or cultural background. With no doubt, reading pictures is a handy and interesting way to be informed of a new "story".

For my final thesis project, the story is a classic ancient Chinese literature called "Journey To The West". My purpose is to make people grow interests to the story with just glimpses of the scenes I created.

Problem Statement

So how to attract people with different backgrounds to get interested in a whole new story within just minutes?

Visual appeal.

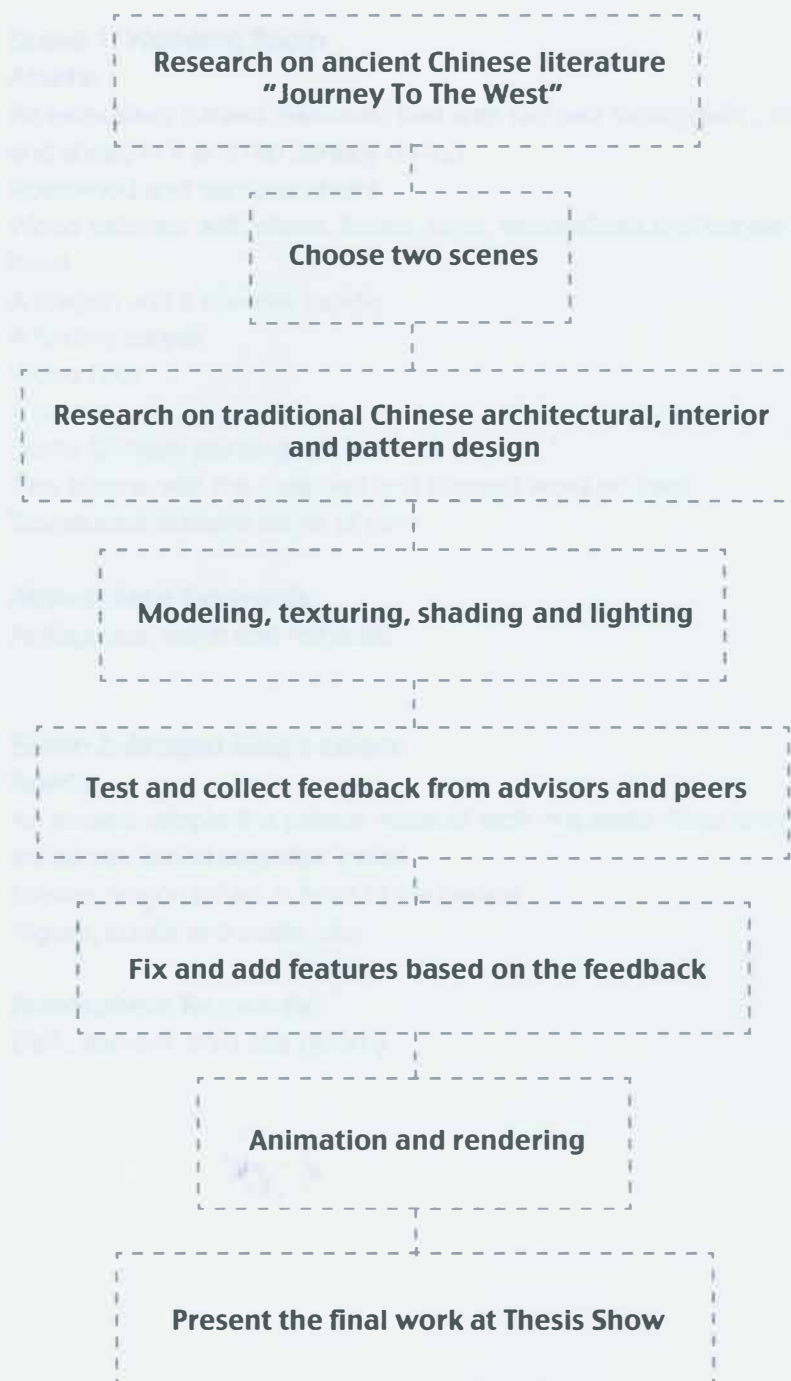
As a student majoring in computer graphics design and with the rich technologies of the CG world, it is possible to catch the eyeball in a more entertaining visual way. The general topic area focuses on using 3d digital techniques (like modeling, texturing, lighting and rendering) to design and represent two detailed miniature environments of the classic Chinese Novel "Journey To The West".

Design Ideation

My design direction explores the use of 3D software, focusing on the process of modeling, texturing and lighting, to create two scenes of the story with cartoonish style but detailed and realistic textures. To make it look more dynamic with options of different visual angles, the camera will slowly fly through the scenes, and then focus on specific objects to give people a better understanding and visual satisfaction.

The final project will consist of several high-resolution rendered images and two short films for about each 30 seconds long. Creating these settings in 3D software will provide viewers with the opportunity to experience the feeling of interior and environmental spaces that existed during the time when the story took place. By using of design and 3D techniques, I aim to interpret the ancient story with a totally new look.

Flowchart



Design Ideation

Methodology

What's inside of the scenes?

Methodology for Scene 1

Scene 1: Wedding Room

Assets:

An exquisitely carved rosewood bed with red bed setting (silk pillow, quilt and sheet) in it and red canopy on top

Rosewood and bamboo chairs

Wood cabinets with plates, bowls, cups, decorations and bonsai, etc on them

A dragon and a phoenix candle

A folding screen

Wood floor

A carpet

Some Chinese paintings on the wall

Two lanterns with the deep red and pleased word on them

Translucent curtains made of yarn

Atmosphere Keywords:

Ambiguous, warm and romantic

Scene 2: Dragon King's palace

Assets:

An ancient temple-like palace made of rock in a water-filled cavern with stalactites and stalagmites inside

Lifelike dragon pillars in front of the palace

Algae, corals and crabs, etc

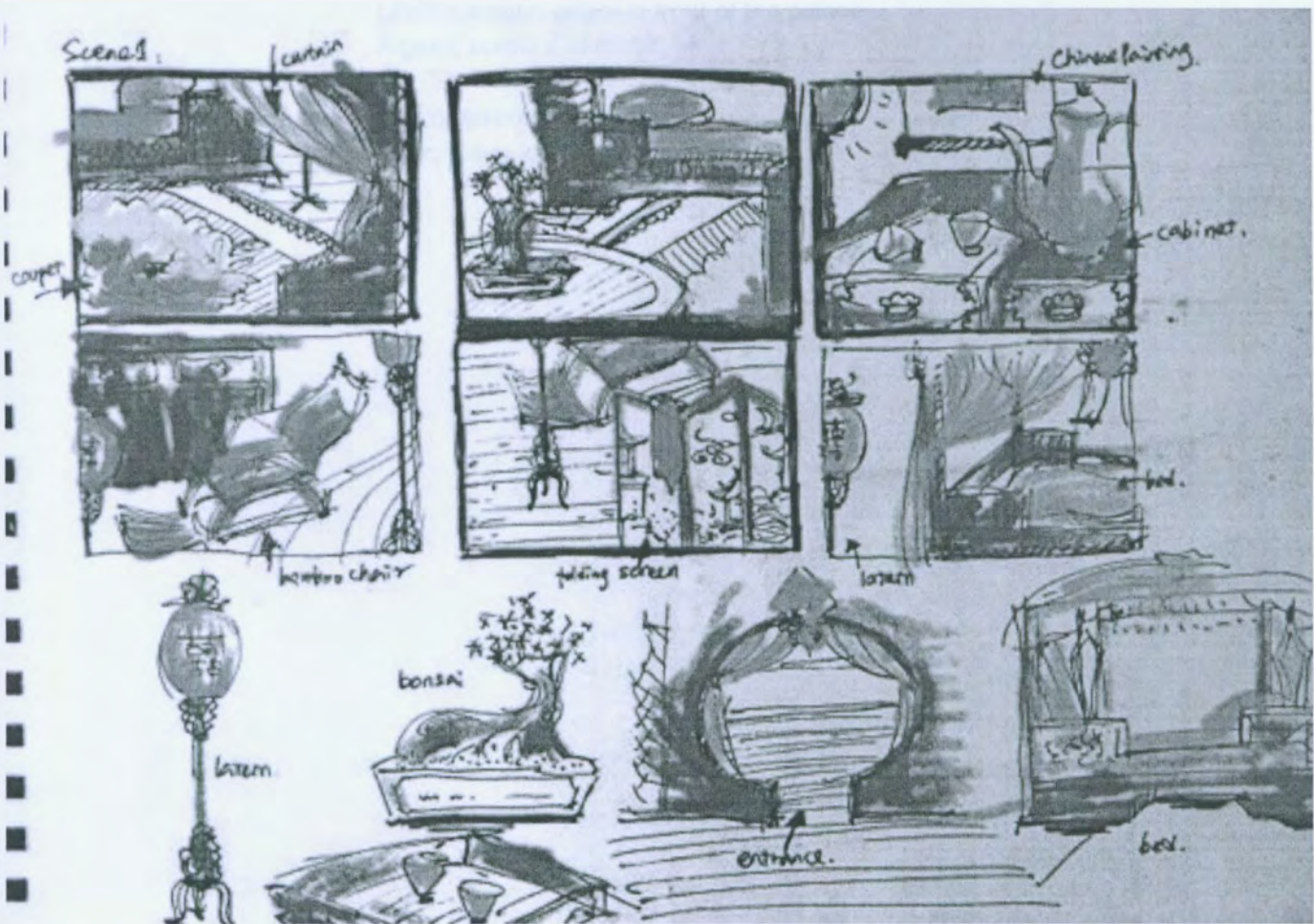
Atmosphere Keywords:

Dark, somber, cold and gloomy

Design Ideation

What's inside of the scenes?

Sketches for Scene 1:



Methodology

What's inside of the scenes?

Scene 2: Dragon King's palace

Assets:

An ancient temple-like palace made of rock in a water-filled cavern with stalactites and stalagmites inside

Lifelike dragon pillars in front of the palace

Algae, corals and crabs, etc

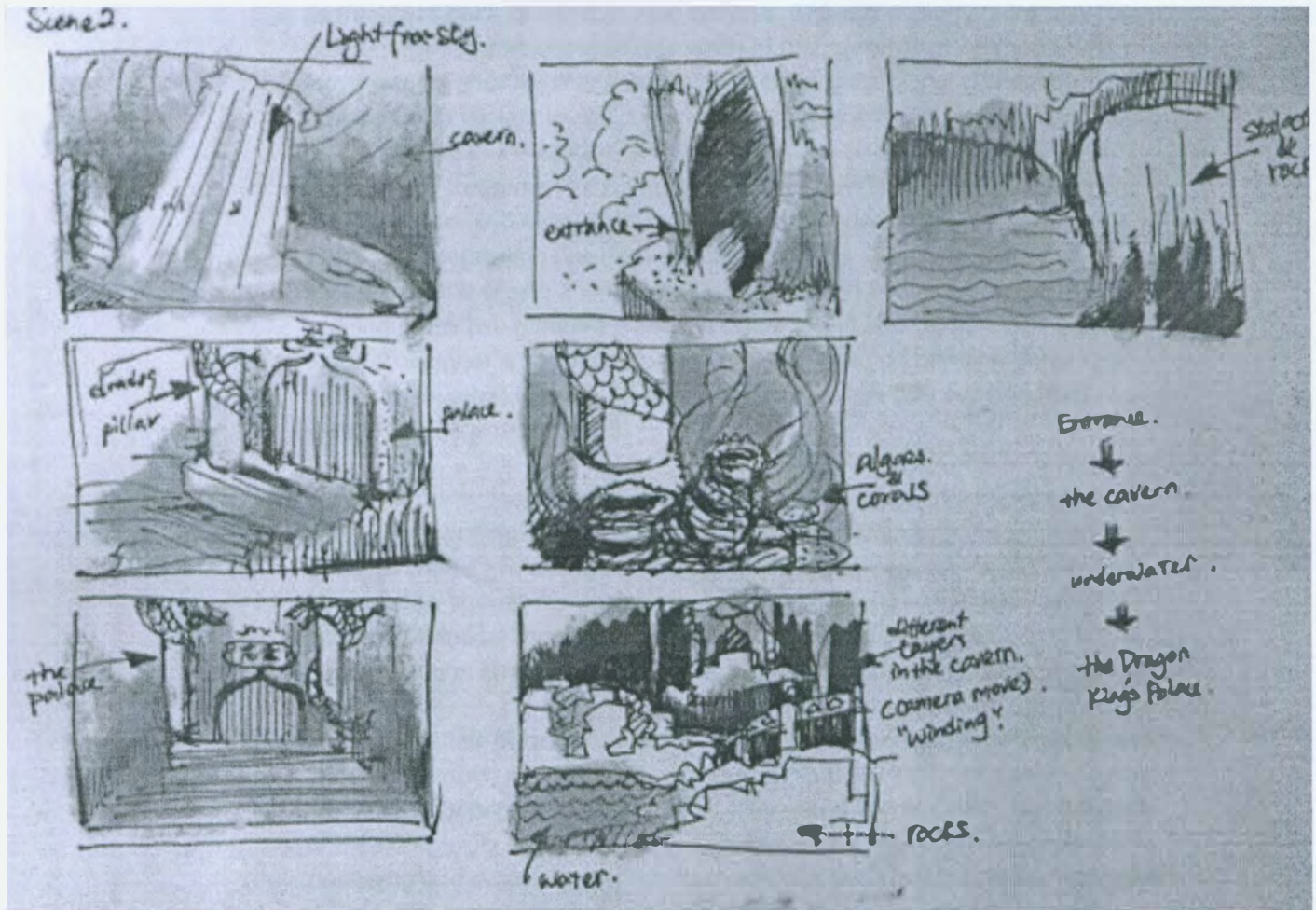
Atmosphere Keywords:

Dark, sober, cold and gloomy

Design Ideation

What's inside of the scenes?

Sketches for Scene 2:



Project Description

Instead of reading someone's story, why can't we place ourselves within it to understand it?

There are many different ways that people become familiar with a story, such as through books, graphic novels, or films. Though each medium may have different levels of artistic qualities, each of them produces an image that stays with us after the story ends. While films and graphic novels may produce a consistent image, books create a near-infinite number of possible realities. Because everyone who watches a film or reads a graphic novel always sees the same visual interpretation, a greater number of people are able to understand everything the designer intended when he produced it. There are people who use books to enter a story, and others who can investigate and create a whole new world through their imagination. In order to bring these two different types of people together to experience the same story, a designer is needed. For this project, I plan on bringing these two elements together through 3D animation to illustrate two settings from traditional Chinese literature.

My design direction explores the diversity of the image-making industry, especially focusing on the process of modeling, texturing, and lighting. I am going to create two scenes in Maya and let the camera move inside of the scenes. The style of my design would be cartoonish but with very realistic textures on them. The final project would come out as several high-resolution rendered images and two short stop-motion films.

Through the use of design, it is my goal to give people a glimpse of Chinese literature through a reimagining of "Journey to the West." This centuries-old story is a very popular and frequently referenced text in China, and because of the complexity of the story and its characters it is a fascinating read. By designing and producing a visual recreation of two classic scenes, I can give people who are not familiar with this story a physical interpretation of this text using 3D animation.

The reason I would like to use 3D techniques(modeling, texturing, lighting and rendering,etc) to build a virtual world, as what I want to do when I graduate. Aside from the fact that the final thesis is a great chance to practice rendering applications, it's also an opportunity to learn more about aesthetics and interior design, mimicking the styles of ancient Chinese interiors and furniture. The advantage of creating an artificial world instead of building a real scene is that you can make changes any time you want. I want to prove that 3D rendering can be used to quickly create a physical representation of an idea, and can also be easily manipulated to cater to certain moods.

Survey of Literature

Journal Title

Journal Title: *Journal of Chinese Environmental Design*
Author: [Name]
Year: [Year]

Target A

Gender: Male
Age: 10
Educational Level: 4th grade

Target A loves cartoon and playing computer games. He finds a story intriguing not by books but by seeing images or animations.

Target B

Gender: Male
Age: 38
Education Level: MFA Degree

Target B is a big fan of CG and says: " Oh sure I would like to know about a story more if it's with some CG images and videos would be even better!"

Target C

Gender: Female
Age: 58
Education Level: Bachelor Degree of Asian Languages and Literature

Has been working in China for more than fifteen years, Target C likes reading and films especially about China. With her specific background of Asia, it is more interesting to see classic scenes from a book in her eyes, "Wow this is different from what I've imagined of this part of the story..but it is very interesting!"

Survey of Literature

Interior/Furniture Design

Changes of Ancient Chinese Interior Design Style

*PeiHuan Wong, Study of Art and Design
WuHan University of Technology, Jun, 2005*

This article lay emphasis in from the flat surface function, space organized form, indoors building material, decorate the skill, decorate the color, indoors to display, esthetics current of thought etc. aspect, treating the changes and proceeds of Ancient Chinese interior design style, and taking into the classification from the different dynasty, different building type.

The Fractal Research of Furniture Design

*ZuoXin Lin, Wood Science and Technology
Beijing Forestry University, May, 2006*

This thesis applied the fractal theory to the research of furniture field; it was the first case in the nationwide and world wide. It was because an important media—nature that fractal theory can be connected with Chinese traditional furniture. Chinese traditional furniture had a culture concept of blending with nature harmoniously, and fractal theory came from nature.

NEW Chinese Houses: The Architectural Heritage of a Nat

By Jonathan Spence, Ronald G. Knapp, Tuttle Pub publishing 2005

This book provides exquisite examples of traditional dwellings are scattered throughout modern-day China. Chinese Houses focuses on 20 well-preserved traditional homes, presenting examples from a range of rural and metropolitan areas throughout China. The photographs of each are accompanied by extensive background information and historical content. An introductory essay examines the different types of Chinese homes and provides an overview of the rich regional variety of Chinese dwelling forms. It also provides insights into little-known design concepts that emphasize the flexibility, adaptability, and versatility of traditional building forms and the work of traditional craftsmen. This classification will be helpful in developing my thesis content for me designing ancient-Chinese-look interior environments.

Pattern Design

The Appeal of the Traditional Chinese Auspicious Signs

*YanBin Gu, Study of Art and Design
Inner Mongolia Normal University, Jun, 2007*

As a vital part of the traditional Chinese culture, auspicious culture makes the benevolent wishes and goals of the Chinese people symbolic, artistic and sociological, and besides, it is also helpful in building up confidence and creativity of the Chinese people in terms of psychological and social development. Auspicious signs are representatives of auspicious culture. Because they are easily distinguished from others, auspicious signs have the features of stability, richness and transitivity.

Survey of Literature

Artwork

Chinese Official Designs and Imperial Porcelain

*By Guo, Xingkuan & Wang, Guangyao,
Forbidden City publishing 2008*

"Official porcelain designs" were detailed, colorful diagrams that played an important role in imperial Chinese porcelain production, serving as a means by which officials could decide on product types and guarantee product quality. This book illustrates over 100 official designs from the Qing dynasty in high-quality color photographs, along with examples of actual imperial porcelain wares modeled after the designs. Also includes several essays and detailed captions. This book provides me examples of elegant patterns of traditional imperial porcelains when I need to work on the illustrations of some bows or vases for my final project.

3D/ Animation Design

Pixel Cinematography

*By John Kahrs/ Sharon Calahan/Dave Carson/Steven Poster
Blue Sky Productions publishing 1996*

This course is designed as a beginning, non- technical course to discuss the how lighting in computer graphics can be used to enhance visual storytelling for cinematic purposes. It collects knowledge and principles from the disciplines of design, fine art, photography, illustration, cinematography and the psychology of visual perception. Although much of the content of this course is not solely applicable to lighting on the computer, its special needs are always in mind. This book for me is a wonderful tool learning how to set lighting for storytelling in computer animation arose from the shortage of available literature on the subject.

The Art of 3D Computer Animation and Effects

*By Isaac Kerlow, Isaac V. Kerlow
John Wiley & Sons Inc. publishing 2009*

This remarkable edition of The Art of 3D Computer Animation and Effects offers clear, step-by-step guidelines for the entire process of creating a fully rendered 3D computer animation. With up-to-date coverage of the latest computer animation styles and techniques, this versatile guide provides insightful information for creating animations and visual effects—from creative development and preproduction to finished animation. This book is a great source of information to create dynamic characters with their very own features.

Marketing Plan

The final work (two 30 sec movies) will be presented on a projector screen on the day of the Thesis Show.

To promote my thesis project, I will upload the rendered images to major blog sites such as Blogspot and some CG Forums. And the videos will be shared on CG video sharing web sites like 3DM3 and CGSociety. I will also submit my completed project to major computer graphics design competitions such as: AIGA Annual Design Competition and Cut&Paste Digital Design Tournament 2010, etc.

Budget

Promotion	\$50
<i>Includes printing cost for promotional poster and business card</i>	
Reference books	\$300
Total	\$350

Technical Tool

Hardware

Personal Computer both Mac & Windows

Software

Maya
 Mudbox
 Zbrush
 Photoshop
 Illustrator
 After Effects

Timeline

Fall Quarter 2010

Week1-Week8

Research
Concept Sketches 70%
Prep for Defence
1st Committee Meeting

Week9-Week10

Research
Literature Research
Concept Sketches 30%
Thesis Proposal Defense

Winter Quarter 2010

Research on architecture, interior design, patterns and textiles.
Research/Self Study on modeling, texturing, shading & lighting

Spring Quarter 2010

Week1-Week5

Modeling 50%
Research/Self Study on modeling, texturing, shading & lighting

Week6-Week11

2nd Committee Meeting
Modeling 50%
Research/Self Study on modeling, texturing, shading & lighting
UV Layout
Shader & Texture Test

Summer Quarter 2010

Research/Self Study on modeling, texturing, shading & lighting
UV Layout
Rough Light Test
Shader & Texture Test
Correction 01
Review from Forums
Self Review (Layout+Texture+Shader+Light)

Fall Quarter 2011

Week1-Week3

Final Light Stage
Correction 02
Composition & Paint overs
Review from Forums

Week6-Week11

Render Passes + Render 2 short films
Prep for Defense
Documentation

Week11

3rd Committee Meeting
Thesis Defense