

BRIDGING BEIJING OPERA AND HIP HOP
A STYLE FUSION EXPERIMENT IN CHARACTER DESIGN

A Thesis

by

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ABSTRACT

The concept of style fusion for visual storytelling is introduced and applied in this research. Style fusion is the process of identifying two distinct styles as sources, which are from different artists or culture backgrounds, and applying features and visual symbols from both to develop a new style. As a proof of concept, the source performance styles selected for fusion are traditional Chinese Beijing opera and hip hop. A set of guidelines for this style fusion are developed after an analysis of the visual symbols of each source style. A character and an environment design fusion are done based on these guidelines. Finally, the style fusion is visualized using 3D models.

DEDICATION

To Mom, Dad, and P.

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CHAPTER I

INTRODUCTION

Style fusion for visual storytelling is the process of identifying two styles which are distinct, from different artists or culture background, and combining the features and visual symbols of both to develop a new style. The two selected styles are called the source styles in this research. The resulting fusion is the target style. The style fusion process involves analysis of both source styles to identify the characteristic features of each, and also to identify the parallels between the two styles. The visualization of the target style can be in variety of mediums, for example drawing, painting, sculpture and 3D models.

In this thesis, the chosen source performance styles are traditional Chinese Beijing opera and hip hop. The visual symbols of both styles are analyzed. A set of guidelines which define the style fusion process are developed. Based on these guidelines, visual symbols are identified and selected from each source style, and new elements suitable for the target style are developed. Finally characters and environment scenes of the target style are visualized in 3D, including modeling, shading and lighting.

Beijing opera, an ancient cultural performance art, has its own unique charm and visual symbols, while hip hop is a modern performance form with much vitality. 3D character and environment models developed by the fusion of these two styles is the focus of my research.

I.1. Beijing Opera

Chinese opera is a popular form of drama and musical theatre in China with roots going back as far as the third century CE. In the 19th Century, Chinese Opera was dominated by one of its sub-genre called Beijing Opera featuring colorful costumes, elaborate make up, beautiful accessories and facial expressions. It was spoken and sung in the Mandarin dialect. The majority of the operatic clothing design comes from the Ming Dynasty (A.D. 1368 -1644). Beijing opera is a spectacle of song and dance, with colorful costumes, make-up, acrobats, jesters, storytellers, acting, poetry and martial arts. These characteristics present Beijing opera in a very unique way [1]. Embroideries on the garments, headdresses, accessories and the different mask designs are the features audiences pay most attention to (See Figure 1). The main goal of the costumes is to identify the characteristics of each role for the audience.



Figure 1. *A formal court setting of Beijing opera. Actors wearing costume in beautiful colors and embroidery with different styles of headdresses [2].*

I.2 Hip Hop

Hip hop culture began in the 1970s on the streets of the Bronx in New York City [3]. Young people who lived in this borough, mostly African-American and Latino, expressed themselves in unique ways. Hip hop street artists used rapping songs, hip hop dance and graffiti to stand out from the crowd (See Figure 2). Because of its enormous crossover appeal hip hop has permeated popular culture and has had influence worldwide.



Figure 2. Hip hop dancing crew *Jabbawockeez* [4] playing in the show *American Best Dancing Crew*.

CHAPTER II

RELATED WORK

Style translation and style fusion have been addressed by several prior research papers. One recent paper is “Study on the Application of Peking Opera Sign in the Creation Process of Character Animation under Semiotics” by Cheng Di and Shuqin Kang [5] introduces a method which combines traditional opera visual symbols and zodiac character animation. The Chinese Zodiac is a scheme that relates each year to an animal and its reputed attributes, according to a 12-year cycle [6]. This paper analyzes the traditional role of the zodiac totem image and the application of visual symbols of Beijing opera to zodiac character animation.

The M.S. thesis by Ranjith Chandy Perumalil, “Style Transfer for Visual Storytelling, A Case Study: The Hindu Mythological Character, Yamahm, in the Style of The American Film Director, Tim Burton” [7], develops style transfer of American film director Tim Burton to the character Yamah from Hindu mythology. This style transfer is done based on the concept of “Pattern Language” introduced by Christopher Alexander in his book, “A Pattern Language” [8]. A set of patterns which define the style of Tim Burton and the style of Yamah in Hindu art, are identified. Yamah and its mount, the buffalo, and also the environment are designed based on the new patterns developed. The design which represents Yamah in Burton style is then visualized in 3D.

Stephanie Ann Strickland in her M.S. thesis “Chinese Painting in 3D: An Artistic Study of the Use of the Traditional Chinese Painting Aesthetic in Three-Dimensional Computer Graphics” [9] explored a study of translating the traditional Chinese painting aesthetic into a 3D medium. It presented a method that maintains the aesthetic of a two-dimensional Chinese painting in 3D through camera movements, 2D-shading and parallax.

Another M.S. thesis “Translating Indian Miniature Paintings into a Time-Based Medium” [10] by Aradhana Vaidya, creates an animation in which the visual style of Indian mural paintings is translated to the characters of a short animated film.

Julie Marie Garcia in her M.S. thesis “Creating Effective Computer Generated Scene Lighting Using Traditional Film Lighting Techniques” [11] deals with the translation of the traditional film lighting styles, into CG environments.

CHAPTER III

METHODOLOGY

My research process involved the study and analysis of Beijing opera and hip hop to understand the visual symbols that define each style. The next step in the process was to develop a set of guidelines to identify the elements to be selected from the source styles. New elements suitable for the target style were also developed. The last step was to realize design characters and relevant environment scenes as 3D models with shading, textures and lighting.

This methodology involved five steps.

- Analyze the Chinese style to identify its characteristic features and visual symbols.
- Analyze the hip hop style to identify its characteristic features and visual symbols.
- Develop guidelines for fused character design
- Develop guidelines for fused environment elements design
- Create example character and environment design based on these guidelines

III.1 Analysis of Beijing Opera Style

Though there is a wide variety in the look of the characters, Beijing opera has a distinctive style. This style was analyzed based on five aspects,

- Character elements

- Costume design elements
- Use of Color
- Scene elements
- Lighting Style

III.1.1 Character Elements

Each character in Beijing opera wears a distinctive costume. Beside the aesthetic functions, it also tells the audience about the rank, social status and personality of the character.

III.1.1.1 Elaborate Headdresses

The headdress is a very important part of the Beijing opera costume. It indicates the social status of the character helps the audience identify specific roles (see Figure 3). Crowns are for the emperor and nobles. Military people wear helmets. Ordinary people wear soft scarves or straw hats. Some types of headgear, such as crowns, are rigid, while others are soft [12].



Figure 3. *The gold filigree king's crown headdress of the emperor. The phoenix headdress with pearls worn by the empress [13].*

III.1.1.2 Pheasant Tail Feathers

A pair of majestic 6-foot pheasant tail feathers embellish the helmets of many martial characters. These feathers indicate the bravery and nobility of the characters. They heighten the dramatic effect of the stage choreography and bring out the different levels of gestures and the rhythm of the movement. They also heighten the expression of the character's emotion [14] (see Figure 4).



Figure 4. *Feathers on the headdress used to heighten the expression of emotion[15].*

III.1.1.3 Armor with Flags

High military officials wear armor. This is a very stiff costume, with brilliant colors and often with a animal imagery design such as dragon to show his high social status. Fully armored actors wear four flags on their backs (See Figure 5). Characters wearing armor with flags usually are very powerful with high social status.



Figure 5. *A military general wears armor with full four flags [16].*

III.1.1.4 Masks

Beijing opera masks are significant. They represent the characters' personalities and moods. Beijing opera masks are either painted on the face or are worn as decorated ceramics [17].

Each color used on a mask has a different meaning. Colors are used to portray a character's role and illustrate their mood and personality. For example, white color indicates a evil or suspicious personality. The character wearing a white mask is usually the villain. People who are brave and loyal wear red masks. Black masks are worn by people with rough, fierce, or impartial personality. Yellow masks stand for an ambitious and fierce personality [18].

Other mask designs and color compositions have different meanings. For example, *god-spirit face* is worn by spirit character who is a human deity. It is related to the magic or special feature of the spirit. For example, the fire god will have flames. On the other hand, animal spirit will have a pictogram of the animal design on the face (See Figure 6) [17].



Figure 6. *God-spirit face* worn by the god of the giant spirit [19]

Another mask design is the *cross-shaped face*. In written Chinese, the number ten is a cross shape. A character with this face generally is a very brave warrior and has a tough nature (See Figure 7).



Figure 7. *Zhang Fei, a brave general of the Kingdom of Shu in operas Three Kingdoms Period, wearing a cross-shaped mask*

III.1.1.5 Costume

Generally, men's costumes tend to be long robes that are usually loose fitting and generally fall straight from the shoulder (See Figure 8). Though the shapes of the

garments repeat, through diverse combination of fabrics, colors and embroidery, the same type of garment can serve a wide range of the characters.



Figure 8. *A warrior holds out the robe of his costume to heighten the dramatic effect of stage choreography [20].*

III.1.1.6 Capes

Capes are full or knee-length wraps worn by both male and female characters. The cape is essentially rectangular, slight curve along the hem (See Figure 9). It is used to imply protection from cold weather or a bad environment [21].



Figure 9. *Character wearing a cape to indicate she is traveling in bad weather [22].*

III.1.1.7 Footwear

A variety of shoes and boots are used in opera performance. These are mainly platform boots, tiger-headed boots and thin-soled combat footwear made of black satin (See Figure 10) [23].

III.1.2 Costume Design Elements

The aesthetic components of costume embroidery are usually a combination of geometric and animal imagery. The aesthetic components are divided into three categories: bordered, dispersed patterns, and consolidated patterns.



Figure 10. *Character wearing decorated high topped, high-soled boots [24].*

III.1.2.1 Borders

Boarders are contrasting color fabrics that are applied to the edges of garments. When used, borders are either plain or embroidered with a motif different from the rest of the garment and are further set off by a bias band. The design motif is usually distinctive oriental shapes evolved from wave patterns (See Figure 11), or like the sacred fungus. The border may also contain oriental dragons, cloud and thunder shape patterns.



Figure 11. *Costume wave patterns. The combination of yellow and blue illustrates 120 degrees of color separation [25].*



Figure 12. *This dispersed pattern has an interlocking grid surrounding a round phoenix motif [26].*

III.1.2.2 Dispersed Patterns

Dispersed patterns are distributed in either a grid or a scattered scheme. The grid scheme has an overall interlocking geometric patterns, either flora or symbolic, with ornaments at each intersection (See Figure 12).

III.1.2.3 Consolidated Patterns

Consolidated designs have three different manifestations, with arrangements of circles, single squares, and yokes (See Figure 13).

A circle is considered as the most perfect shape. It appears on the costumes of high-ranking characters, often manifested in dragons and phoenix. Square motifs are suitable for civil and military officers as rank badges. The yoke is a less common decoration in Beijing opera.



Figure 13. Consolidated patterns (A) Circle [26] (B) Square [27] (C) Yoke [28]

III.1.2.4 Imagery

The characters of written Chinese language are based on pictorial images. Many of the written characters evolved from symbolic drawings of the concepts of the words.

In the same way, the images employed in opera costumes were selected for their associative values. They have a function beyond beauty.

III.1.2.4.1 Floral Imagery

Roundel patterns, butterflies, floral and fruiting sprays, and garden vignettes were reserved for women's dress. They are embroidered on the costume (See Figure 14).



Figure 14. *Stylized chrysanthemums on a female Beijing opera garment [29].*

III.1.2.4.2 Animal Imagery

In Chinese culture specific animals carry desired qualities. They were embroidered onto clothing to endow the wearer with those attributes. For example, the

tiger, embodying courage and fierceness, appears on the garments of a warrior. In Figure 15, the dragon on the lower apron indicates that this character is a warrior for the emperor.



Figure 15. *A military costume embroidered with animal imagery [30].*

III.1.2.4.3 Emblematic Imagery

Emblematic imagery includes pictures of objects associated with religious concepts in Buddhism, Taoism, and Confucianism (See Figure 16) [31].



Figure 16. *Five bats, representing the five blessings, encircle the written character for longevity [32].*

III.1.3 Use of Color

The use of color in costumes is a distinctive aspect of Beijing opera. Each color carries cosmic meanings. Color is also connected to the personality traits and social ranks of characters.

Costume colors are divided into a system of five upper and five lower colors. The upper colors are red, green, yellow, white and black. They usually appear on garments of leading characters, nobles and officials. The lower colors are purple, pink, blue, lake blue and olive green. The lower colors are usually worn in informal scenes. The following describes some of the typical applications of color meaning [33].

III.1.3.1 Upper Five Colors

In Beijing opera, red is generally associated with respect, honor, and loyalty. High-ranking people such as nobles and principle statesman wear costumes in red. Red also reflects the personality of passion. Green indicates a high-ranking military function for the wearer. It is worn by generals and civil officials in charge of the military. Only the emperor, members of the imperial family, and their retinues can wear a specific hue of yellow. This color choice comes from the historical designation of yellow for royalty. White garments can be used for men who have grace, charm, and loyalty to their country. Black represents characters who enforce laws and penalties, and who are straightforward, brave, honest and upright [34].

III.1.3.2 Lower Five Colors

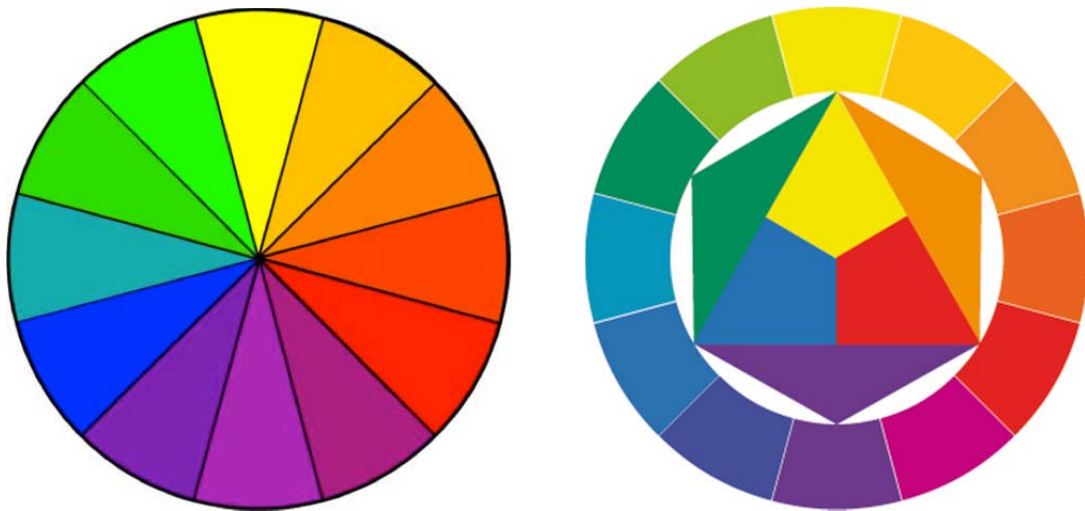
The five lower colors are purple, pink, blue, lake blue and Olive green. Purple suggests old age and the respect that come with that status. Pink indicates youth that is good-looking with a romantic personality. Extremely brave and fierce warriors wear blue. Lake blue is for youthful roles, both male and female. Usually it is considered scholarly, elegant and good-looking, Olive green is used to represent elderly characters.

III.1.3.3 Embroidery Colors

Colors in the embroidery are to complement the fabric color. The threads used have metallic colors (See Figure 15) .

III.1.3.4 Degree System for Fabric and Embroidery Floss Colors

A color wheel degree system of color combinations is used as a guideline when embroidering the garments (See Figure 17A). Color combinations are divided into three categories, 180 degree combination, 120 degree combination and 90 degree combination. This 12 steps color wheel used for Chinese opera degree system is different than those used in western color theory such as popular 12 steps Itten color wheel [35] (See Figure 17B). For example, on Chinese color wheel, green and blue colors are at 90 degree separation, but on western Itten wheel they are at 60 degree.



(A)
Figure 17. Color wheels (A) Chinese color wheel used for the degree system
(B) Western Itten wheel [35]

III.1.3.4.1 Complementary Colors

Complementary colors are opposites on the wheel, or 180 degree apart. These are the most striking of contrasts, for example, red and green combinations or orange and blue combinations (See Figure 18).

III.1.3.4.2 Colors Separated by a Third of the Wheel

Colors separated by a third of the wheel, or 120 degrees, create a contrast with less impact. Color combinations in this category include red and yellow, yellow and blue, and blue and red (See Figure 11). These combinations appear more frequently.



Figure 18. *The combination of red and green illustrates 180 degrees of color separation [36].*

III.1.3.4.3 90 Degree Combinations

Colors that are adjacent on the color wheel, which corresponded with the analogous range illustrate the 90 degree combination. Color combinations in this category include yellow and green, green and blue, blue and lavender.

III.1.4 Scene Elements

The main scene elements used in Beijing opera are:

- Teahouse or temple courtyard
- Stage furniture

III.1.4.1 Teahouse or Temple Courtyard

Early Chinese stages were set up in a teahouse or in temple courtyards, and featured a thrust stage with areas on three sides for viewing (See Figure 19).



(A)



(B)

Figure 19. (A) Internal structure of a teahouse. (B) Three-story stage designed for Beijing opera performances of the Summer Palace, Beijing, China [37]

III.1.4.2 Stage Furniture

The stage settings are characterized by simplicity and flexibility. This is in contrast to the elaborate costumes and makeups. Usually only a table and two chairs comprise the principle pieces of furniture on stage (See Figure 20) [38].



Figure 20. *Two chairs and a table, the default setting for interior scenes.*

III.1.5 Lighting Style

Early Beijing opera was performed in the daytime with no artificial lighting. Now it is normally performed under fully illuminated white light, without blackouts or changes of lighting between scenes (See Figure 21) [39].



Figure 21. *Beijing opera performed on a modern stage*

III.2 Analysis of Hip Hop Style

Hip hop is a subculture that originated in African American and Latino American communities during the 1970s in New York City, specifically within the Bronx [3]. While the term is often used to refer to hip hop music, in its broader sense hip hop culture is characterized by four elements: rapping, DJing, hip hop dance and graffiti [40]. Similar to the classification of the elements of Beijing opera, the elements which define the style of hip hop are:

- Character elements
- Design elements
- Use of Color
- Scene elements
- Lighting style

III.2.1 Character Elements

III.2.1.1 Hats

III.2.1.1.1 Baseball Caps

In the early 1990s, pop rappers such as *The Fresh Prince*, *Kid 'n Play*, and *Left Eye of TLC* popularized baseball caps. They wore them tilted, turned to the side, and backwards (See Figure 22) [41].

III.2.1.1.2 Fedora Hats

In the 1990s and 2000s, some rappers added fedora hats to their look. Rappers like *Jay-Z*, the *Notorious B.I.G.*, and *LL Cool J* sported these broad-brimmed felt hats.



(A)



(B)

Figure 22. (A) A member of dancing crew Jabbawoockeez wearing a baseball hat.
(B) LL Cool J wearing a fedora hat.

III.2.1.2 Masks

For some hip hop artists, wearing a mask is to draw a line between their personal life and life on stage. Some hip hop street artists use masks as their visual signature (See Figure 23). Another reason that hip hop street artists wear masks is as a tribute to the 1970's San Francisco strutting crew *Medea Sirkas*.



Figure 23. Wearing masks is a visual signature of the dancing crew Jabbawoockeez.

III.2.1.3 Oversized Eyeglasses

Run-D.M.C., pioneers of hip hop in the 1980s, were known for their music and unique style. Their all-black outfits with the giant gold chains were mimicked by other hip hop artists all around the country. Large, black eyeglasses with small metal detailing were a trademark look and become an important element of hip hop fashion (See Figure 24).

III.2.1.4 T-shirts with Graffiti Patterns

As a very important element of hip hop culture, graffiti patterns appear on many hip hop garments. T-shirts are one of the most important. Graffiti-inspired art and strong social messages were airbrushed on the T-shirts (See Figure 25). Hip hop T-shirts crossed over into the preppy look in the late 1990s. Polo shirts in bright colors such as blue, yellow and even pink became popular [42].



Figure 24. *Oversized glasses, the trademark look for group member, D.M.C.*



Figure 25. *T-shirts with graffiti patterns*

III.2.1.5 Jeans

Jeans have always been a visual symbol of the hip hop look. In the 1970s and 1980s, slim-fitting jeans were popular with both men and women. Some DJ and graffiti artists painted their names down the legs of their jeans. In the 1990s, baggy jeans started to replace slim jeans (See Figure 26). The jeans hung down around the hips with no belt. Because belts could be used as a weapon, prisoners were not allowed to have them. Hip hop street artists copied this prison look to appear tough [43].



Figure 26. *Baggy jeans*

III.2.1.6 Sneakers

Sneakers are very important in hip hop fashion. Hip hop street artists started wearing sneakers in the 1970s. Clean white shoes proved that a dancer had skill. Only “bad” dances scuffed their sneakers. Popular sneaker brands included Nike, Converse

All Stars, Adidas and Pumas. Hip hop street artists used wide laces to match the color of their hats and T-shirts (See Figure 27). Today, custom-designed sneakers are popular in hip hop fashion. Hip hop street artists paint unique patterns on the shoes [44].



Figure 27. *Sneakers with colorful laces*

III.2.1.7 Blingbling Accessories

The term “bling” started in the southern United States. In the late 1990s, southern rappers *Lil Wayne and B.G.* sang about bling in their hits “*Millionaire Dream*” and “*Bling Bling*”. The bling look began with long heavy chains in the 1980s. It has since become a staple of hip hop fashion. In the 1990s, hip hop street artists added flashy pendants to their chains (See Figure 28). The heavy jewelry was suggestive of prestige and wealth, and some have connected it to Africanism [45].



Figure 28. Hip hop star Slick Rick wearing blingbling accessories.

III.2.2 Costume Design Element

III.2.2.1 Icons of Hip Hop Culture

Hip hop culture is characterized by four elements: rapping, Djing, breaking and graffiti [40]. The icons representing these four elements are the patterns appearing often on hip hop costumes (See Figure 29).

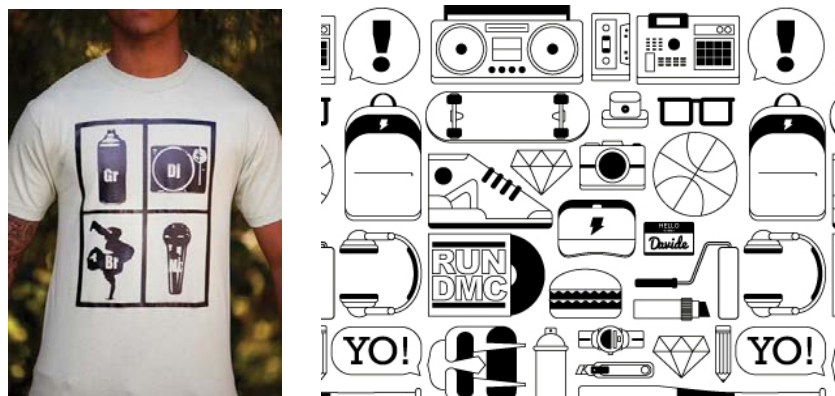


Figure 29. Icons represent hip hop culture.

III.2.2.2 Logos from Hip Hop Fashion Brands

Logos from famous hip hop brands including Nike, Converse All Stars, Adidas and Puma are another kind of design patterns appearing on the hip hop street artists' costume (See Figure 30).



Figure 30. *A brand logo of Adidas print on a T-shirt*

III.2.2.3 Design Pattern from Graffiti

The styles of Graffiti are full of variety, such as cartoons, figurative art, comics, Pop art, Japanese culture, and abstract art. Graffiti is usually presented in one of four forms: Tag, Through-Up, Stencil or Piece.

III.2.2.3.1 Tag

A tag is a stylized signature of a graffiti artist. It is the most prevalent type of graffiti. The color chosen for a tag contrasts sharply with its background. Graffiti artists often use tag on or beside their pieces, following the practice of traditional artists who sign their artwork [46] (See Figure 31).



Figure 31. Graffiti artist signed with a tag next to his works [47]

III.2.2.3.2 Throw-up

A throw-up is between a *tag* and a *piece* regarding complexity and time investment. It generally consists of a one-color outline and one layer of fill-color. The letters are often formed with bubble shapes (See Figure 32) [48].

III.2.2.3.3 Stencil

Stencils are also popular for graffiti. Stencil art using spray-paint can be produced quickly and easily. It is especially attractive to political artists [46]. For example, British artist Banksy[49] is well known for his use of stencils (See Figure 33).



Figure 32. Example of throw-ups [50]



Figure 33. Banksy's stencil work

III.2.2.3.4 Pieces

A *Piece* is a large and labor-intensive graffiti painting. *Pieces* often incorporate 3D effects, arrows, and many colors and color-transitions, as well as various other effects. The term piece was originally shorthand for masterpiece. It is considered the most complicated and beautiful work of graffiti. A piece requires more time to paint than a throw-up (See Figure 34) [46].



Figure 34. Example of pieces[51]

III.2.3 Use of Color

Graffiti color is generally very bold, using rich colors and clear outlines. The painting strokes are full of variety and generally sprayed on.

III.2.4 Scene Elements

Scene elements that appear in many of the hip hop presentations are (See Figure 35):

- Hip hop dancing poses
- Boomboxes
- Urban street views
- Graffiti on walls

III.2.4.1 Hip Hop Dancing Poses

Hip hop dance refers to street dance primarily performed to hip hop music. It includes a wide range of moves, primarily breaking, locking, and popping. The biggest difference between hip hop dance and other forms of dance is that it is often freestyle in nature. Hip hop dance crews often engage in freestyle dance competitions, referred to as *battles*. Crews, improvisational freestyling, and battles are identifiers of this style [52]. Each dancer or dance crew usually has its own signature poses.

III.2.4.2 Boomboxes

The boombox became intrinsically linked to hip hop culture when hip hop street artists did dance battles with it on the street. Some dancing crews embraced the boombox as a signature element.

III.2.4.3 Urban Street View

As a street dance style, hip hop evolved outside of dance studios. Dance crews usually performed in open spaces such as streets, parks, schoolyards, and factory yards.

III.2.4.4 Graffiti Works on Walls

Graffiti, one important element of hip hop culture, appears very often in the space where hip hop street artists perform their dance battles.



Figure 35. *A hip hop street artist dancing in front of a graffiti wall with his boombox.*

III.2.5 Lighting Style

Most hip hop dancing happens outdoors on urban streets. There is not a specific lighting setup, usually daylight or illumination from street lamps and neon lights. When

dancers performing on stage, to direct the audience's attention and to set the tone of a scene, besides basic stage illumination, special effects are also used. For example, flame effects, fog effects and laser lighting effects are synchronized with the music (See Figure 36).



Figure 36. *Illumination on modern stage with laser lights and fog effects*

III.3 Style Fusion Guidelines

With the unique visual elements of both Beijing opera and hip hop identified, the next step was developing a set of guidelines for the style fusion. Once the guidelines suitable for the target style were developed, a character and an environment were

designed based on those guidelines. There are several aspects to consider in the style fusion.

1. The character design must effectively incorporate the essence of both source styles. Designs have to have elements which create the look of Beijing opera and also include features from hip hop style.
2. The fusion should not just be a simple combination of the two styles, but rather an innovative style. The design fusion is not gathering all elements from both source styles and putting them on one character. It should be a process that includes redesigning some of the elements, making them have the features of both source styles. For example, instead of the cotton-silk armor in Beijing opera, armor was made of flashy metal in this fusion. As in hip hop, heavy accessories are suggestive of prestige and power (See Figure 37).
3. Being tough is a very important quality for hip hop street artists. The analysis of hip hop style indicated many elements are used for showing a tough personality. This is also an important quality for Beijing opera characters. Much classic Beijing opera is about heroic characters in history who made great contributions to defending their country, fiercely resisting unfair fate. Thus, elements that indicating a tough or brave personality of the character should be kept in the style fusion.
4. Being unique is also an important quality for hip hop culture. By using graffiti-inspired art, strong social messages airbrushed on the T-shirts, signature dancing pose and exaggerated accessories, hip hop street artists express their uniqueness.

Similarly, the roles in Beijing opera present their characteristics using headdresses, embroideries on the garments, accessories and the different designs of masks. Therefore, elements that are crucial for presenting the uniqueness of the characters should be kept in the style fusion.

5. Beijing opera is an ancient oriental cultural art, while hip hop is a modern western art form. When thinking about the fusion between these two styles, consideration should be given to achieving balance between ancient and modern, oriental and western. The resulting style should not include too much of one source style or the other.

There are multiple possible results from fusing these two art forms. In this research, these guidelines were used to develop one possible fusion. The elements were selected for artistic and aesthetic reasons. Some of the elements of the source styles may not be appropriate. These inappropriate elements could be discarded in the final design. Incorporating all the different elements into one single scene was not appropriate.

III.3.1 Selection of Character Elements

Based on the guidelines, a collection of elements suitable for the target style were selected or developed from the character elements of the source styles. Following are the elements developed for the design of the character and props.

III.3.1.1 Painted Masks from Beijing Opera and Oversized Eyeglasses

The target character needs to look tough and strong, as those are important qualities of hip hop culture. In written Chinese, the number “ten” is a cross shape.

Chinese opera character with this face generally is a very brave warrior and has a tough nature. So the mask was painted in the cross-face style.

Oversized eyeglasses were added to make the character more hip hop and more powerful. They are the trademark look for group member, *D.M.C.*, one of the most influential acts in the history of hip hop culture. They also give the character a sense of mystery.

III.3.1.2 Chinese Opera Robe and Baggy Jeans

The loosely fit shape of the robe from Beijing opera was selected. It fell straight from the shoulder, in contrast with the complexity of patterns. The robe's length ends around the waist. The bottom part of the costume was the baggy jeans of hip hop style. A pair of baggy jeans is a very important element for hip hop style. It also provided a much clearer outline when the character is presented in a dancing pose.

III.3.1.3 Capes

The shape of the cape is rectangular, flying in the wind. It heightened the dramatic effect of the stage choreography and brought out the dramatic gestures of the character. The flying cape showed the power and fearless personality of the character.

III.3.1.4 Full Armor with Flags

Instead of the cotton-silk armor of Beijing opera, here the armor was made of flashy heavy metal, as in hip hop heavy accessories. It is suggestive of prestige and power (See Figure 37).

III.3.1.5 Baseball Hat

The contrast of the clean shape and color of a baseball hat with the rich colored painted face and complex armor achieved a balance of the two source styles. When the hat was worn tilting, it added the feeling of modern and young.

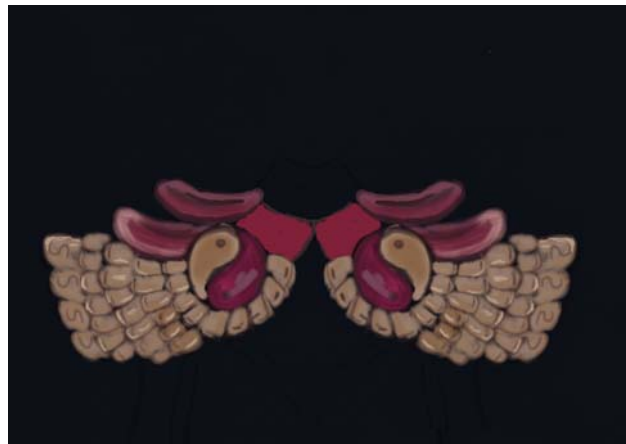


Figure 37. *Armor concept*

III.3.1.6 Long Feathers

The long feathers were selected as they enlarge gestures and make movements more expressive. With the movement of the feathers, the emotion of the character is more expressive.

III.3.1.7 Blingbling and Metallic Accessories

Long, heavy look chains, with flashy pendants have become a staple of hip hop style. This heavy jewelry is suggestive of prestige and wealth [45]. In this style fusion, the flashy pendant was made of the characters *hipopera*, which is an anagram of the words "opera" and "hip hop".

III.3.1.8 Sneakers with Wide Laces

The shoes have the shape of classic sneakers with oversized laces to show the toughness of the character. The sole is much thicker compared to the ordinary sneakers, to resemble the Beijing opera performance boots.

III.3.2 Selection of Design and Color Style

The next thing to consider was the use of color and design patterns for the character costume. In the center of the robe, a circle-consolidated pattern was used. The imagery inside it is the logo of the classic hip hop brand *Adidas*. It was embroidered on. The font was transformed so it looks more oriental. The background pattern of the garment is a diagonal interlocking pattern of distinctive oriental wave shape. At the neckline and cuffs of the garment water wave patterns are applied. So, in this fabric design, both patterns from Beijing opera and hip hop were included.

For the pants, to keep the essence of hip hop style, the loose fitting shape and jeans were selected. The characters “hipopera” are painted on the jeans to resemble the style of graffiti *throw-up*. Painting dots are sprayed on the surface of the fabrics. At the hem of the pants, water wave patterns are applied (See Figure 38, Figure 39).

III.3.3 Selection of Scene Elements

The elements selected for the final scene are the following:

- Temple courtyard
- Graffiti on walls
- Boomboxes
- Hip hop dancing poses

These elements are selected for compositional reasons. It is impossible to include all the elements analyzed into a single composition.

The Beijing opera initially was played in the royal temple (See Figure 40). The royal temple was surrounded by red walls (See Figure 41A). In this style fusion, the walls were covered with graffiti (See Figure 41B). The walls with graffiti stretching away from the temple toward the camera created powerful visual impact. This added interest and was different from previous impressions of the royal palace.

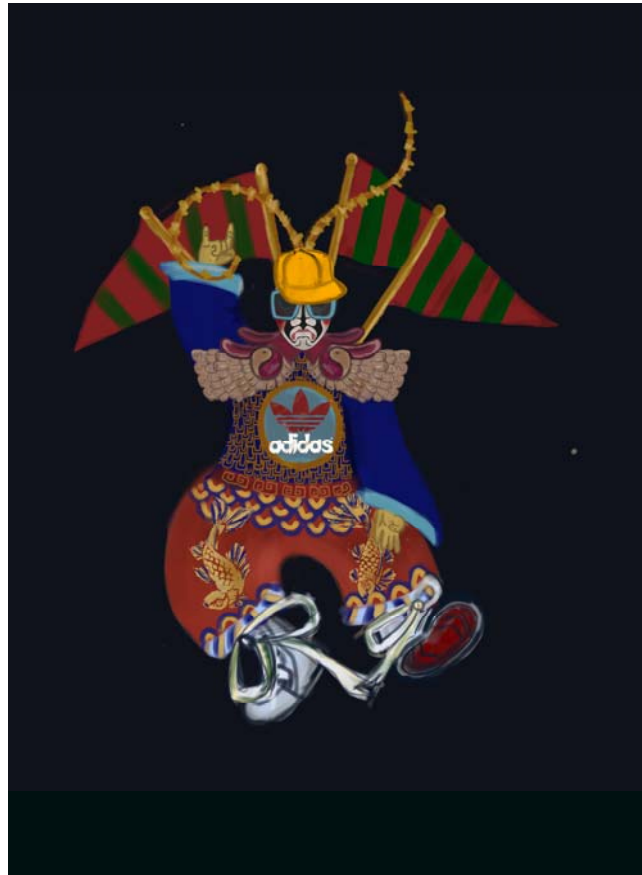


Figure 38. *Character concept*

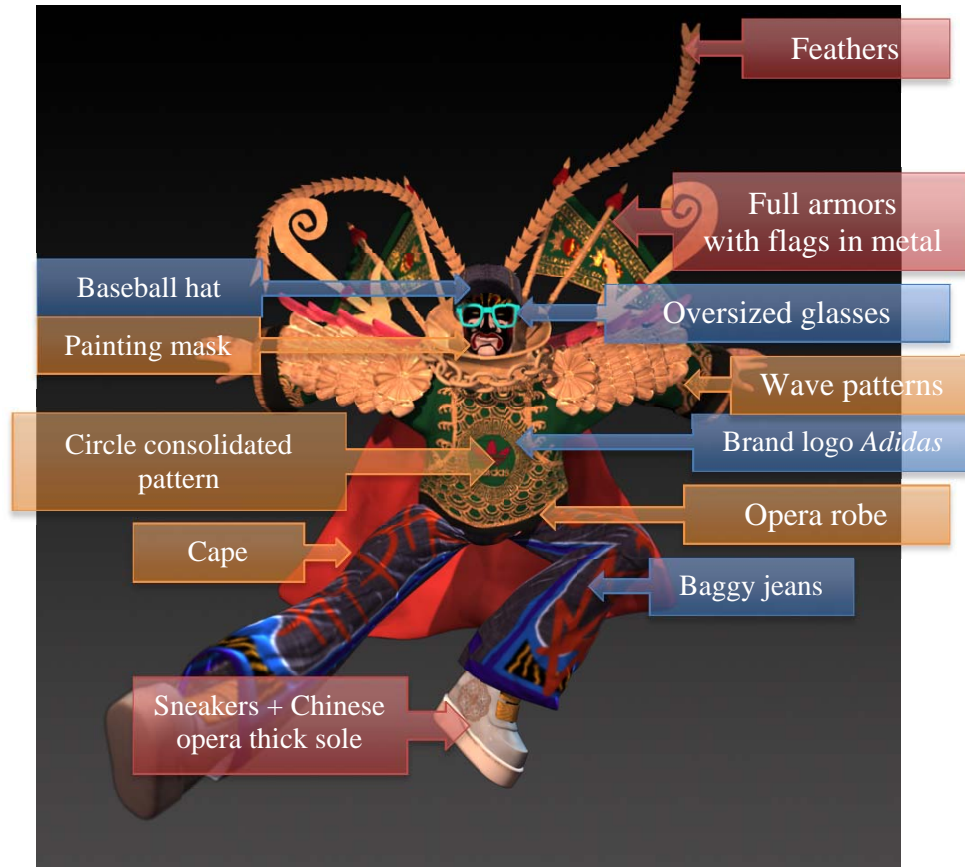


Figure 39. *Visual analysis of the character elements selected based on the style fusion guidelines*

The boombox in the foreground enhance the sense of liveness from dancing battles (See Figure 42). In the center of the scene the character is presented in a signature hip hop dancing pose with the cape flying in the wind. This has a strong, powerful dynamic beauty (See Figure 43, Figure 44).

According to the composition elements and environment settings, daylight is the main illumination for the scene. The golden hour before sunset was the selected time. The golden hour, sometimes called the "magic hour," generally means the last hour of light before sunset. During this time of the day, the sun is at a low position in the sky,

producing a warm, soft, diffused light. This type of illumination added a warm glow and a passionate, energetic feel to the scene. At that time of the day, objects usually have long shadows, which help create dramatic visual impacts, and add greater texture and depth to the scene. The warm color also reflected the passionate attitude of hip hop. Red is also the traditional joyful color of Chinese culture.

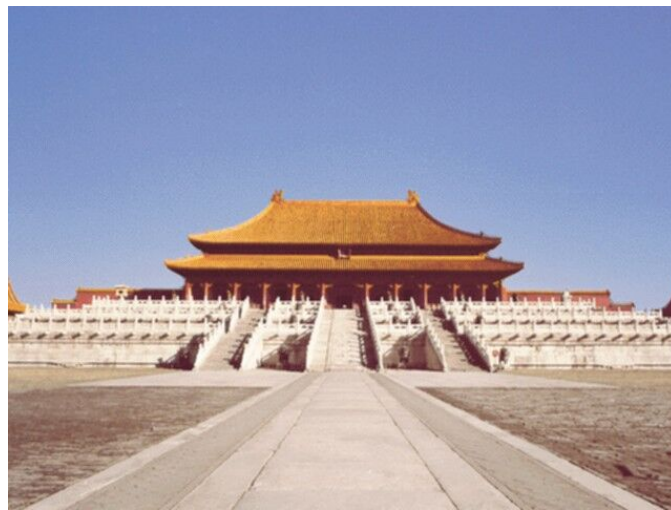


Figure 40. *Chinese royal temple*

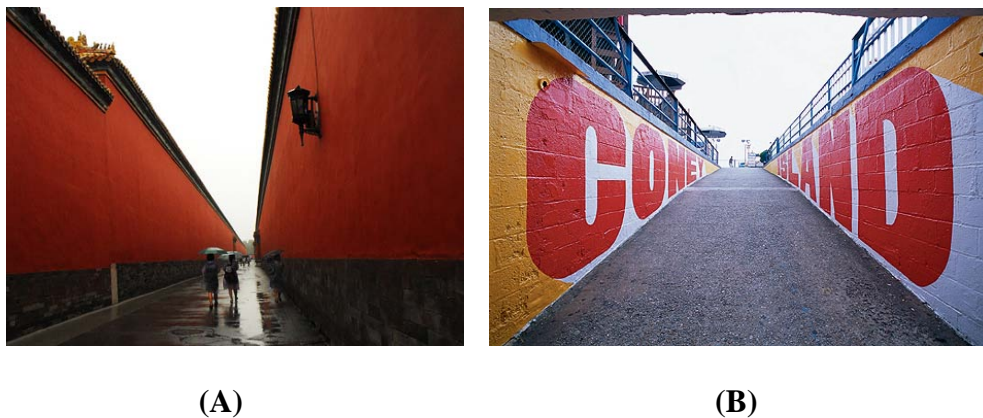


Figure 41. (A) *Royal temple's red walls* (B) *Graffiti works on the walls*



Figure 42. *A boombox in front a graffiti wall*



Figure 43. *Concept art for the environment*

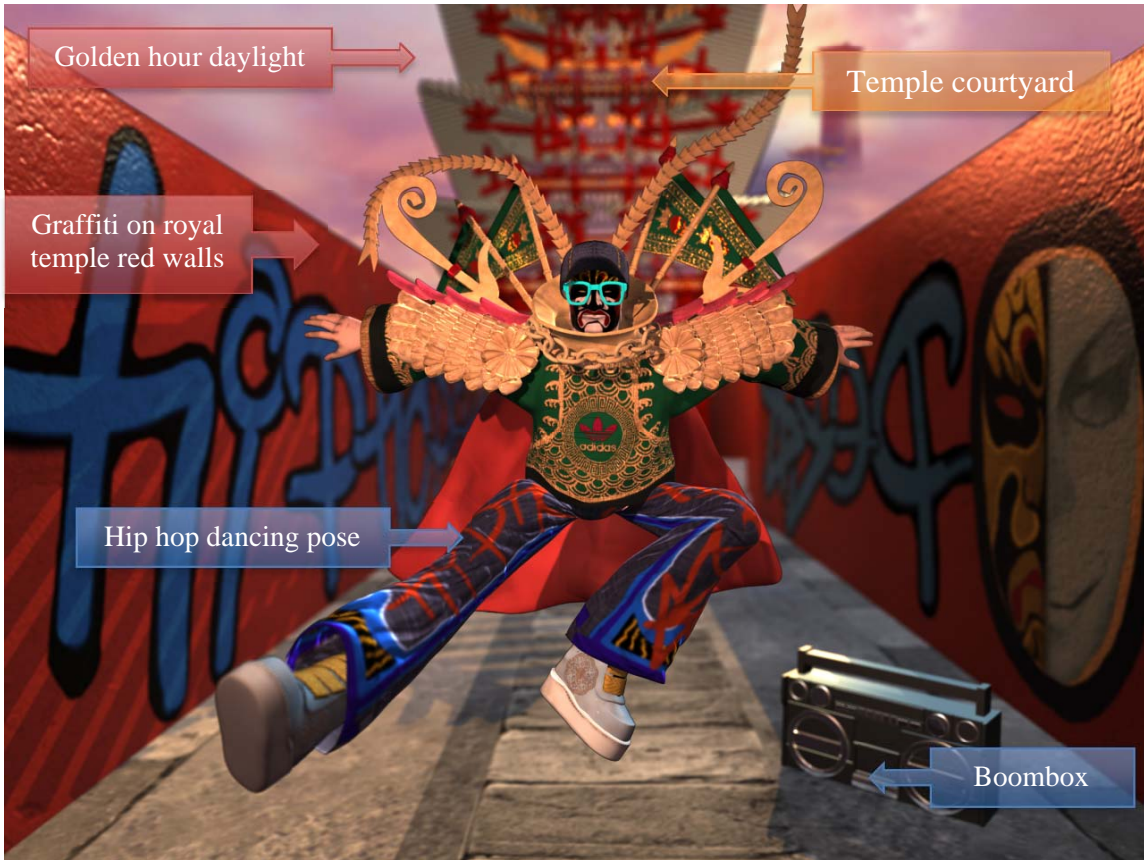


Figure 44. *The environment elements selected based on the style fusion guidelines*

CHAPTER IV

IMPLEMENTATION

The implementation was to visualize the designed character and environment in 3D. The staging of the scene was given significant consideration. The character and environment elements were created with polygonal modeling methods using Autodesk Maya [53]. Details were created with the digital sculpture tool ZBrush [54]. The character model was then posed in a selected hip hop dancing pose. The next step was texturing and shading the elements in the scene. Before illuminating of the scene, an environment background was created using a matte painting. The scene was rendered using Renderman [55]. Postproduction including color correction and compositing was done with Adobe Photoshop [56] and After Effects [57].

IV.1 Modeling & Rigging

Creating models for the character and environmental elements used two methods: polygonal modeling and ZBrush digital sculpture.

Maya's polygon modeling tools were used to create geometry for the character, props (costume, armor and accessories) and environmental elements (teahouse, city wall and old school boombox). Polygon modeling involves arranging a set of connecting faces (planes made up of at least three vertices) into the desired form. Polygon subdivision techniques were applied to each polygonal model to give it a smoothed appearance [58].

The character head was modeled with the shape and bone structure of an African American male since hip hop originated in African American communities. The upper part of the costume was modeled as the simple, loose fitting robe shape of a Beijing opera costume, falling straight from the shoulder. The pants were modeled as baggy jeans. The shoes were modeled in a classic sneaker shape with exaggerated laces and thicker sole. The armor from Beijing opera was modeled with a stiff shape and shaded with a metallic texture. The flags and feather were modeled to resemble those of a Beijing opera costume. A cape was added to balance the complexity of the head decoration. It also gave a fiercer look to the character.

The next step was rigging. Rigging is the process of constructing a hierarchical set of interconnected “bones” to articulate the polygon surfaces. After rigging, the character was posed in a signature hip hop dance posture (See Figure 45).

The fine details of the garments, such as folds, were sculptured using Zbrush. These sculptured details were applied to the models using displacement mapping [59]. This provided surfaces with a sense of depth and detail (See Figure 46).



Figure 45. *Posed 3D character model*



Figure 46. *Clothes details sculpture using Zbrush*

IV.2 Texturing

In this study, texture mapping was used for the objects in the scene. Texturing defines the appearance of a surface and how it reacts to light [60].

The basic principle behind texture mapping is using 2D image files to determine surface attributes. A simplified way of visualizing texture mapping is applying a decal to the surface of an object [61].

To facilitate texture mapping, we begin with a process called UV unwrapping [62]. This is the process of unwrapping the surface of a 3D model into a 2D space. Once a 2D mapping of the model's surface is created, it can be used as a reference in creating texture maps. These are then be mapped back onto the model in 3D space.

ZBrush's UV unwrapping tools "UV Master" was used to unwrap the objects. This step was crucial to the success of the texture mapping process. If it was not done

properly, the maps would be difficult to create and might not properly align to the model (See Figure 47).

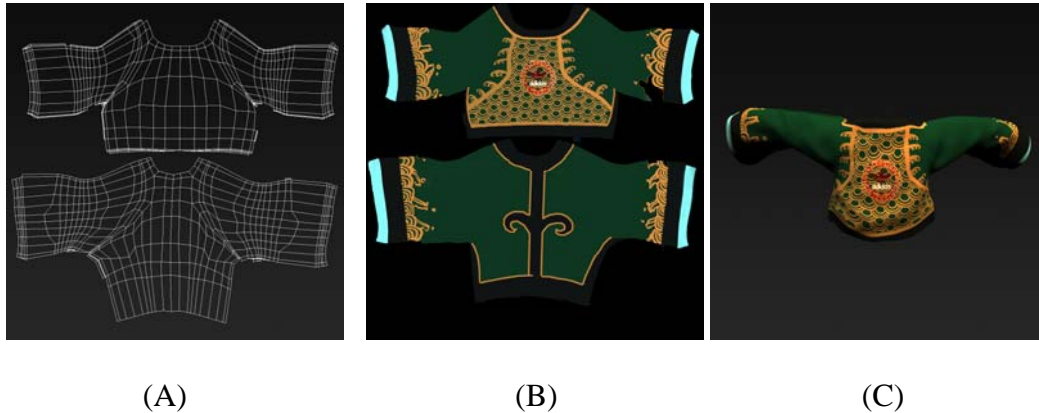


Figure 47. (A) *Costume UV layout* (B) *Texture map* (C) *Rendered textured model*

Zbrush's polypainting function was used in creating the texture maps of the character and environment elements. These included color maps, transparency maps and displacement maps. Polypainting allows users to paint in 3D space on an object's surface. After the polypainting in Zbrush, the texture maps were exported into Adobe Photoshop. Photoshop was useful in changing color hues, increasing contrast, desaturation and adding blur (See Figure 48).

Based on the guidelines developed in Chapter III, the facial mask was painted with a cross shape in the center to show the character's tough personality. The design patterns on the costume and flags were composed of oriental patterns and hip hop designs. These were drawn in Zbrush and then exported as texture maps. The embroidered patterns were achieved using both color maps and displacement maps. A

separate specular map was used to get metallic specular highlights. For the environmental elements, the same approach was applied to get texture maps and displacement maps.

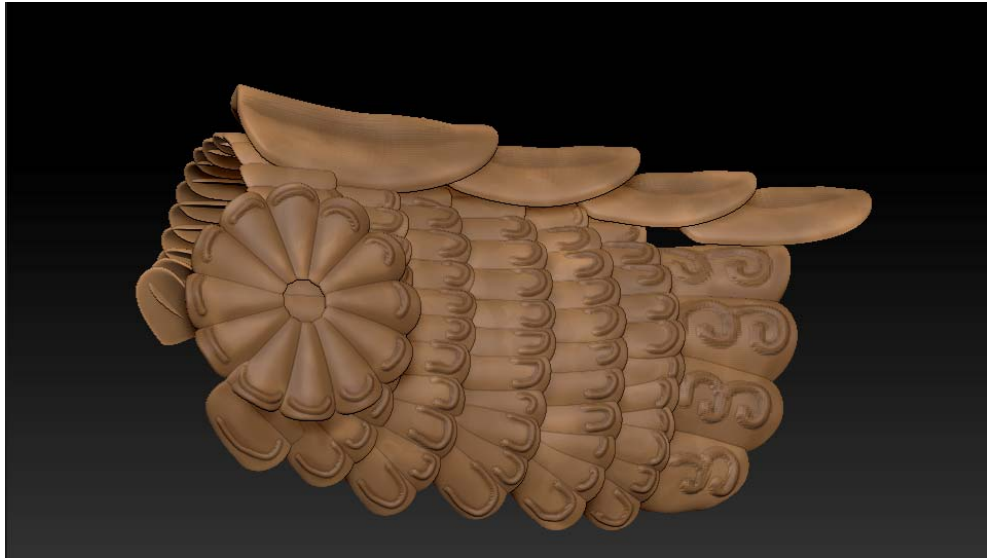


Figure 48. *Armor texture polypainting process in Zbrush*

Once the appropriate texture maps were created, Renderman’s shader network building program, “Slim”, was used to create surface shader that were applied to the objects in the scene [55].

IV.3 Lighting

According to the environment guidelines from Chapter III, illumination for the scene is the golden hour before sunset. During this time the sun is low in the sky, producing a soft, diffused light. It adds a warm glow to the objects in the scene, creating

a very pleasing feel. Long shadows help pick out details, enhancing texture and depth in the image.

IV.3.1 Lighting for the Character

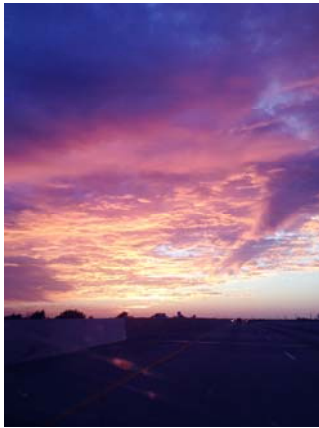
Classic three point lighting was used for the main character. The dominant light source is called the key light. In the golden hour, sunlight and sky light were the key lights of the scene. Two directional lights were used as key lights for the character. Four spotlights were used as the fill lights to simulate the light bouncing from the ground and walls. Two additional intense spotlights were used to create a defined golden rim around the character. An additional low intensity spotlight was used to augment the lighting bounced from the ground, lighten the face of the character. According to the sunset golden hour setting, a long, strong shadow of the main character was raytraced from the key light. This added a dramatic quality to the scene. It also helped add depth to the image.

IV.3.2 Environment Lighting

Same as lighting for the character, two directional lights were used as the key lights from sunlight and sky reflection to illuminate the environment. Very low intensity environmental illumination was used to fill the scene and soften the image. The wall was lit with five spotlights. Fill for the floor was created with five spotlights positioned above the area of the floor. Two spotlights were used to create the rim around the tower. One additional spotlight was used for the boombox, simulating light bouncing from ground.

IV.4 Matte Painting

Matte painting involves the creation of a background painting for extending the virtual space of a scene. To create the matte painting, existing images were used. They were painted over to combine them together to get the final image. According to the golden hour lighting and other scene elements in this fusion, the setting sun, pink clouds with golden borders, a distant temple were elements in the matte painting (See Figure 49).



(A)



(B)

Figure 49. (A) *Original sunset picture.* (B) *Matte painting.*

IV.5 Final Rendering

By setting digital camera's depth of field (DOF) in Maya, objects in front or behind the focal plane appeared out of focus. This helped highlight the main character.

The character and the environment elements were rendered using Renderman [55]. The final image consisted of compositing the matte painting and the environment scene with the main character. The image was then color corrected and post edited in Adobe Photoshop to get the final images (See Figure 50, Figure 51).



Figure 50. *Final rendering of the fusion design*



Figure 51. *A poster based on the fusion design*

CHAPTER V

CONCLUSION AND FUTURE WORK

V.1 Conclusion

This thesis is focused on the fusion of Beijing opera and hip hop. Figure 50 shows the final results of this style fusion. Unique features and visual symbols of each style were identified. Guidelines for the style fusion were developed. The guidelines were applied in the creation of a 3D scene. The selection of elements from each source was mainly based on artistic and aesthetic reasons. Composition was also taken into consideration. The colors and lighting were selected to express the mood of the styles.

The thesis explored a way to combine two distinct performance styles, which were from different history, culture background and target audiences, into a new style with artistic and aesthetic values from both. Beijing opera, with its own unique charm and visual symbols, was a very precious culture heritage. But, it faces some difficulties such as aging and declining of knowledgeable audiences. Hip hop is a modern art form with more and more influence worldwide. The character design developed in this research was an interesting experiment, bringing new focus to both styles. The desired goal of successfully combining traditional Beijing opera and hip hop style was accomplished.

V.2 Future Work

My research focused on the visual design of characters and environments, not on animation. One area that deserves exploration is animating the 3D characters developed in this thesis; creating narrative animations with innovative performance combining the style of both Beijing opera and hip hop dancing.

The method used to fuse the style of Beijing opera and hip hop could be extended to other art forms or styles. For example, the classical Japanese dance drama Kabuki and the style of Walt Disney animation character could be an area of exploration for style fusion.

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