TRANSLATING INDIAN MINIATURE PAINTINGS INTO A TIME-BASED MEDIUM

A Thesis

by

ARADHANA VAIDYA

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE

May 2008

Major Subject: Visualization Sciences

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Approved by:

Chair of Committee,	Carol LaFayette
Committee Members,	Weiling He
	Michael Greenwald
Head of Department,	Tim McLaughlin

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ABSTRACT

Translating Indian Miniature Paintings into a Time-based Medium. (May 2008)

Aradhana Vaidya, B.Arch., Nagpur University, India

Chair of Advisory Committee: Prof. Carol LaFayette

The purpose of this research and the corresponding project is to explore and interpret the qualities of the traditional art form of Indian miniature paintings into a digital, time based medium. These are beautiful, finely-drawn paintings with rich detailed patterns and striking bold colors. Intricately and meticulously drawn, they employ an alternative means of representation distinctly different from a conventional lens-based perspective. Most 3-dimensional digital media makes use of either a real or a virtual camera to inform the representation of space. In this project I deviate from this convention to create a new visual style for animation. The project demonstrates how a consistent yet different visual look can be achieved that retains the richness and visual expression of the traditional painting style through the use of new technology.

To my family

ACKNOWLEDGEMENTS

My sincerest thanks go to my committee chair, Prof. Carol LaFayette, for her valuable guidance and support throughout this thesis. I would like to especially thank her for her keen interest in my project and for keeping me focused. I would also like to thank my committee members, Dr. Weiling He and Dr. Michael Greenwald, for their feedback and encouragement.

I would like to thank my friend, Amnaya Awasthi, who composed the music for the project of this thesis.

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CHAPTER I

INTRODUCTION

I.1 General Introduction

Indian miniature paintings are beautiful, finely drawn paintings that captivate the viewer because they are intricately detailed and vividly colored. Some of these paintings are portraits of kings and rulers and contain information about their lifestyle, attire and ornament. They also provide a glimpse of a world of grandeur and celebration as well as courtly pursuits and pleasures. However, these are romantic settings glazed with a layer of idealization. The paintings depict a world of fantasy. This is a different way of depicting and viewing the world when compared to European paintings of the same period.

Western paintings of the 13th and 14th century, as well as later Renaissance paintings, are deeply connected to optics. Renaissance painters had knowledge of lens-based systems, and their paintings reflect this. In contrast to this, Indian miniature painting is an alternative way of seeing and observing. The artist did not use a lens-based or perspective-based method of representation. His way of drawing was observing and symbolically representing on paper what he saw. The artist often idealized the setting and the painting was a combination of his observation and his fantasy.

This thesis follows the style and format of the *ACM Transactions on Graphics.*

With mediums such as film, television and digital imaging, there is a wide range of possibilities for representation. With computer manipulation, even photographs which appear to be true representations need not be real. They can be changed, altered and manipulated to represent something exotic and unreal but believable. The computer is changing the way we create and understand images. Digital imaging allows us to see space from multiple viewpoints, unlike a painting or a photograph where we see a space only from a specific viewpoint. This is the reason why films seem closer to realism. They give us a sense of space, and along with sound effects make things more believable. On the other hand, although paintings are still images, they are captivating. A well done painting has power and though it is static and silent it engrosses and engages us. It can also stay with us physically. Film, video and television, which are all time-based, are ephemeral in some sense. They may not last forever because of archival and storage problems. We still have to devise a method of securely storing digital data, without the danger of it being lost, corrupted or destroyed.

I was fascinated by the possibility of combining these two different mediums -- a still painting and a video. I wanted to work with Indian miniature paintings as they defy the perspective we are so used to seeing because of our exposure to photography and films. Miniature paintings offer an alternative way of looking at the world around us. If this form of viewing is combined with moving images, it would offer a new medium of representation. In this thesis I will interpret miniature paintings in a time-based medium.

This work creates a three dimensional (3D) space or environment which we view differently, not like a conventional 3D perspectival space.

I.2 Artistic Intent

Indian miniature paintings have always been a source of attraction for me because of their captivating beauty and fineness in detail. These paintings also present a different way of representing the world that is distinctly different from the conventional perspective drawing that we are used to seeing. It is a traditional Indian art form in which considerable importance is given to symbolism, rich detailing, bright colors and intricate drawing. I wanted to explore the possibility of using these paintings and their method of drawing and representation in a time-based medium. I have worked with different digital mediums, and in all my work perspective has always played an important role. Because of our contemporary association with film, photography, video and 3D software, we always look at 3D artwork through a real or virtual camera. Most creations are lens-based, the method of representation with which we are comfortable.

Since miniature paintings offer an alternative and different means of representation, it fascinated me. Sometimes the compositions look like murals or collages as if the miniature artist is looking at the world from different viewpoints and rearranging elements as his mind perceives them, and not necessarily as how the eye sees them. My motivation for bringing these paintings into a new medium, which is not the paper on which they were originally made, is to develop a new visual style for animation. This

style is distinct and is clearly inspired by the traditional art form of Indian miniature painting.

I.3 History of Indian Miniature Paintings

The two main categories of Indian paintings are wall paintings and miniature paintings. Wall paintings were usually painted over palace walls or temple ceilings. Perishable by nature, a very few of these paintings have stood the test of time. Those that have survived are cave paintings as they remained protected from the weather. Most famous of these are in Ajanta and Bagh (1^{st} to 6^{th} century A.D). Early paintings done on cloth or canvas have not survived, but since they are mentioned in plays of the fourth and fifth century, we know about their existence (Brijbhushan 1979).

The earliest examples of paintings that have survived are from the eleventh century. They were made on palm leaves and were about 3”x12” in size. They were meant to be illustrations for religious books or scriptures (Figs. 1 and 2). As these paintings were enclosed between wooden covers, they remained protected and well-preserved. Since these were religious works they were placed within temples and were cared for and protected (Brijbhushan 1979). These were the first miniature paintings.

Fig. 1 Folio illustrating episodes from the Jarasandha story, c.1625-50 (from Pal, 2004)

Fig. 2 Folio 35 from *Karnaparva* of the *Mahabharata*, c.1670 (from Ehnbom, 1985)

For this thesis, I will focus on the Rajasthani style of Indian miniatures created for the Rajput emperors. The term "Rajput" is used to describe Hindu rulers of small and large kingdoms in northern India, which existed from 16th century onwards. The Rajputs had a penchant for religious themes, and this was seen in the literature and music of those times. Most of these paintings were meant to be held in the hand and not hung on walls. The paintings were passed from hand to hand among a group of admirers sitting together. The Rajputs often commissioned works to observe a religious occasion, to offer as a wedding gift, or to record a special memorable event (Pal 2004). Some of the paintings were created by artists as gifts for their patrons. Most of the artists were professionals in the ruler's court, and some of them were independent painters.

This style was also influenced by the Mughal rulers who came from outside India through present-day Afghanistan led by Babar in 1526 (Lal 1997). The Mughal emperors

were connoisseurs of art who helped set up workshops for the artists and introduced new mediums and new drawing styles. Under their patronage, the art of miniature paintings flourished throughout India and developed further as regional schools took on the local characteristics of that area (Brijbhushan 1979). Various schools of Indian miniature paintings emerged, and each had its unique style and characteristics. The style of painting and subject matter varied greatly between the Rajput paintings and the Mughal paintings. While the Mughals preferred historical and natural veracity, as well as portraiture with realistic details, Rajput patrons had a tradition of mythological and rhetorical themes, depicted in simple compositions saturated with bold and vivid colors (Pal 2004).

CHAPTER II

VISUAL ANALYSIS OF MINIATURE PAINTINGS

II.1 Characteristics of Indian Miniature Paintings

My intention for this thesis is to develop a new visual style based on Indian miniature paintings. There are several reasons why this style of painting is distinct, and it is important for me to understand the various characteristics of this unique style since I will be drawing in a similar style to create my animation.

One of the characteristics of Indian miniatures is the outline within which every figure is enclosed (Fig. 3). The outline is thick or thin depending on the artist, the period and the style of the painting. Ancient Indian treatises known as the *puranas* describe the art and science of painting in detail. The entire process is described, including the method of drawing, painting, making colors and making brushes. Pencils were used for preliminary sketches and drawings. They were made from natural materials such as cow dung, powdered slag or lamp-black. After drawing the initial outline, the paper was coated with a layer of zinc and then the colors were filled in. Brushes were made from soft hairs from the ears of bullocks and donkeys, and the fibers of certain trees. These fibers were inserted through one end of a feather quill and tied to it. They were of various sizes and thicknesses, depending upon their use. For instance, pearls and dots were painted with rounded brushes, color filling or washes were done with thicker brushes and outlines were done with very thin brushes. After preliminary sketching, the detailed coloring and

shading was done in several layers, such as background, body colors, clothing and other accessories, and gold where required, using various brushes. Then the final outline was drawn again with a very fine brush, sometimes with a single hair. These thin brushes were also used for detailing skin and fur. After this, the reverse side was burnished on polished glass or polished marble. The finishing touches involved painting in ornaments and reddening of hands, feet and lips (Brijbhushan 1979).

Fig. 3 Maharaja Gaj Singh, Jodhpur, National Museum Delhi, c.1670 (from Crill, 2000)

Another distinct characteristic is that these paintings are very detailed and intricately drawn. These rich paintings show fineness in the brushstrokes and painstaking detail of designs and textures (Figs. 4, 5). Sometimes they are viewed with a magnifying glass as the details are not visible to the naked eye. When viewed like this, one can notice the detail in the skin or the fur. There are thousands of brushstrokes and every hair of the eyebrow or whiskers is painted. Each layer of clothing is also visible through the outer garment. The painting usually had several layers of colors. Each layer was allowed to dry completely before the next layer of color was applied. The order for the application was: background, body, clothes and other accessories, and gold or other ornaments where required (Brijbhushan 1979). After completion, the painting was mounted and the borders were painted. In most paintings the borders have detailed patterns to create a framing for the painting (figures on pages 17 and 25). The attire and carpets are also rendered in detail and with precision. When the painting is viewed closely, one can observe detailed floral or geometric patterns and ornamentation. In some well done paintings, the folds in the fabric, the cloth texture, the transparency, the embroidery and the border-work are clearly visible (Figs. 4, 5). Even ornaments are detailed to perfection (Figs. 6, 7). Though the facial features such as the eyes are idealized, the face does not lack individuality. If the painting is a portrait of a prominent ruler, it is majestic, heroic and conveys his powerful personality. Individual facial features, hairstyle, sideburns, hands and feet are precisely detailed.

Fig. 4 Detail of the painting of Maharaja Abhai Singh on horseback, Mehrangarh Museum Trust, Jodhpur, c.1725 (from Crill, 2000)

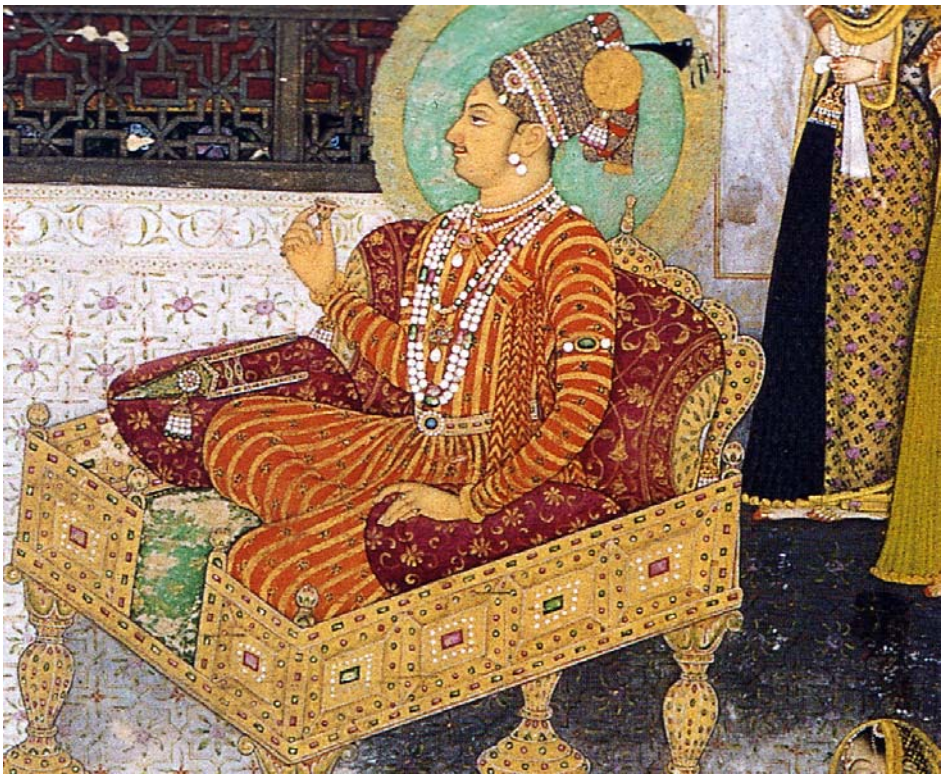

Fig. 5 Enlarged detail from Fig 6

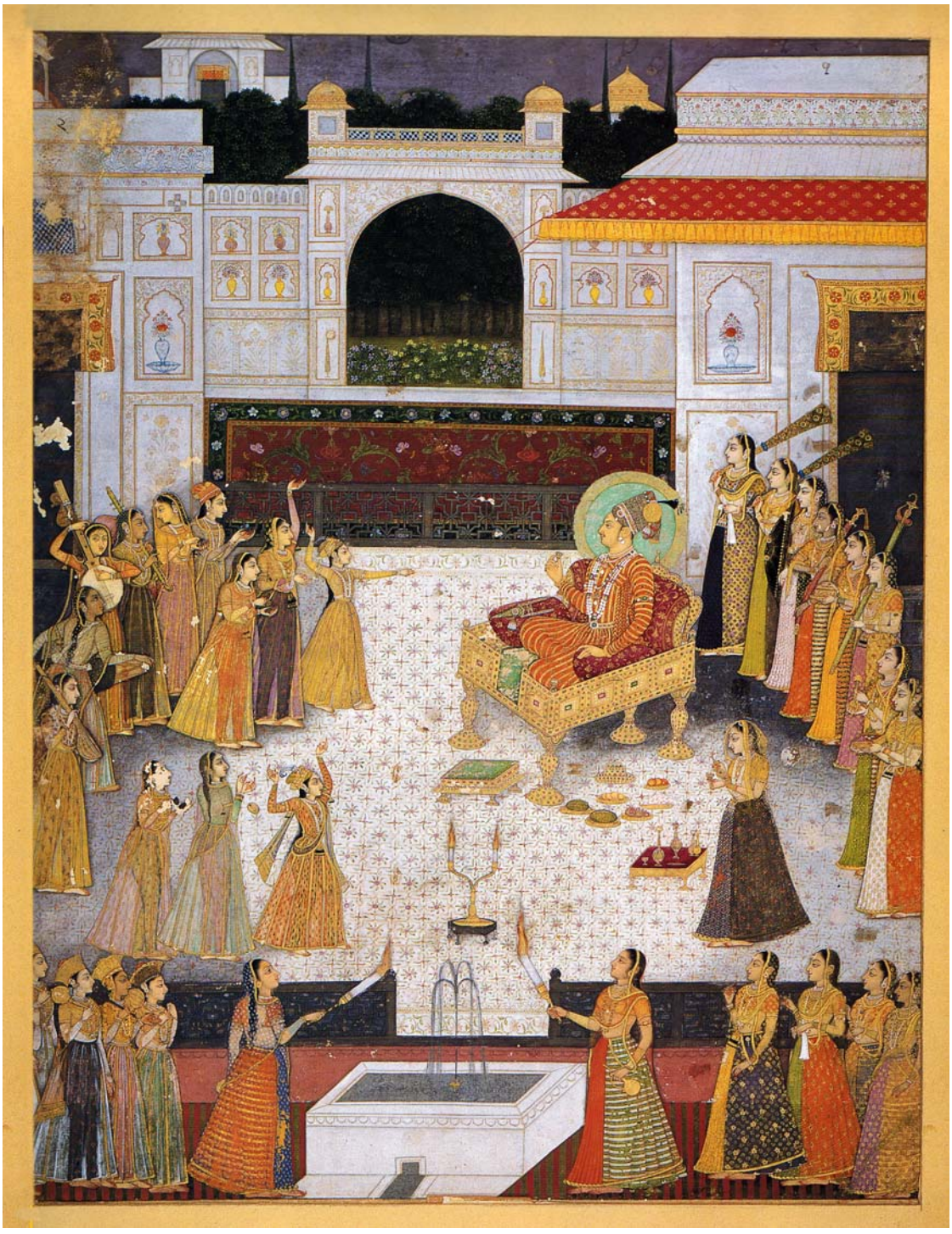

Fig. 6 Maharaja Abhai Singh watching a dance performance, Mehrangarh Museum Trust, Jodhpur, c.1725 (from Crill, 2000)

Another important aspect of these paintings is the way in which human figures are depicted. Most of the time a person performing an action seems to be totally detached from the act. The subject is physically engaged, but he or she does not display emotion. The size of the figures might seem disproportionate to the surroundings (figure on page 24). This contrasts with Western or European paintings, where depicting the right emotion is a strong aspect of the painting, and figures are scaled in proportion to the environment. According to Ehnbom, the Indian miniature painting is a stylized or symbolic representation and not a literal depiction (1985). Every subject or object in the painting had a symbolic meaning attached to it. Rajput royalty were not really keen on documenting their mundane life. Most of these paintings portrayed the ruler as a resplendent, larger-than-life figure, often with a halo emphasizing his divine nature (Fig. 7). Symbols were sometimes added to convey his personality. He may be with his pet falcon or a sport-animal to show his love for hunting, or he may be holding a flower to emphasize his cultivated nature (Pal 2004). These types of paintings were popular and were often commissioned by the patrons to showcase their grandeur and splendor. They always depicted an ideal setting intentionally removed from reality.

In these paintings surroundings were also idealized. Landscapes contained symbolic meanings. Summer is associated with a deep pool, a deer standing in shade, buffaloes wallowing in the mud, or people in languid poses. The rainy season is depicted, for example, by clouds, lightning, and birds on trees (Fig. 8). In autumn, the trees are heavily laden with fruits and the fields are full of crops. Mountains are usually covered

with rocks, trees and waterfalls. The night sky is full of stars. The forest has thick trees, full of birds and beasts (Fig. 8). The water abounds with fish, tortoises and lotuses (Brijbhushan 1979). As Pal says “The paintings provide glimpses of a world of pomp and ceremony, as well as the courtly pursuits and pastimes of both men and women, though through rosy, romantic lenses and glazed with a veneer of idealization” (2004).

Fig. 7 Maharaja Basant Singh and Maharaja Sahab Prithvi Singh, Ramesh and Urmil Kapoor Collection, c.1775 (from Pal, 2004)

Fig. 8 Lovers watch the approaching rains, Kangra painting, early 19th century (from Ehnbom, 1985)

In contrast to this, very few paintings depicted the activities of women. In a painting when a woman is depicted with her husband, she is significantly smaller. Prostitutes are shown with heavy makeup. This gender inequality was inevitable in a society that kept women in seclusion (Pal 2004). It is also difficult to determine whether some of the paintings which do show women dancing or engaged in some activity are results of actual observation or just figments of the artist's imagination (Fig. 9). Another aspect of this depiction of social inequality is that certain tribes or lower-caste people are of dark-complexion, while higher castes are invariably given lighter skins and are also of a larger size when depicted with subordinates.

Fig. 9 Ladies gazing at the moon, Bharat Kala Bhavan, Banaras, c.1830 (from Crill, 2000)

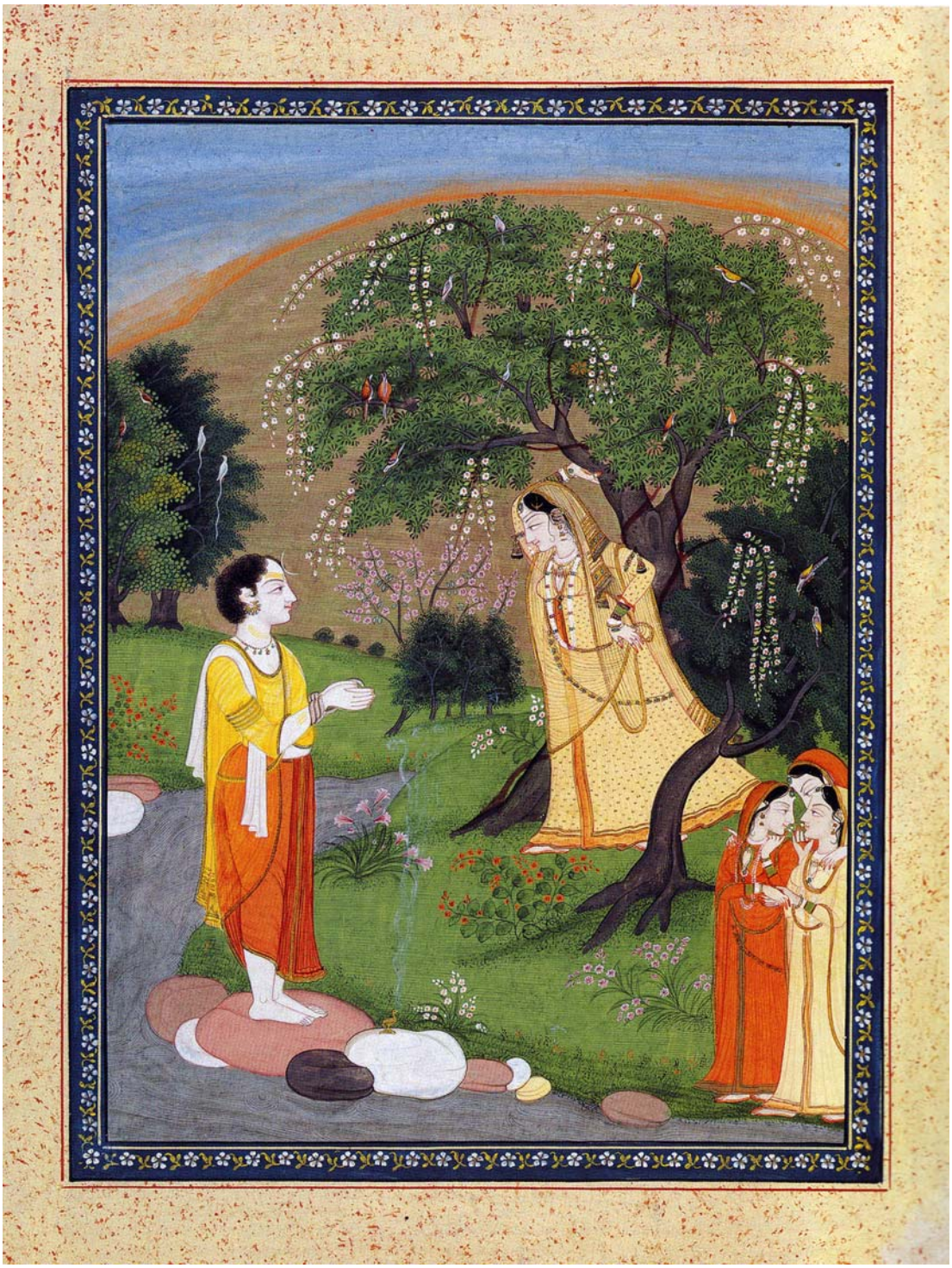

Fig. 10 Shiva and Parvati with companions, Ramesh and Urmil Kapoor Collection, c.1800-1825 (from Pal, 2004)

Another distinct feature of these paintings is that artists use spatial cues other than perspective as an alternative method of representation. We can compare miniature paintings to some of the early 15th century European paintings of subjects wearing decorative clothing. The detail of the fabrics and cloth in these paintings is similar to that of Indian miniature paintings. The fabrics are elaborate, but do not follow the form convincingly and hence look flat. If we compare the fabric in the paintings in Fig. 11(a) and 11(b) with Masolino's painting created in c.1425 (Fig. 12a), they look similar in the rendering of the fabric. Although the attire is detailed with the texture, the patterns do not closely follow the folds. But in contrast to this in Antonio's painting (Fig. 12b) the pattern and the detail in the fabric closely follows the complex curved surface of the fabric. In Hockney's opinion some artists in the 1500's were using optical devices and tools instead of just eyeballing. This is the reason they could accurately render these detailed textures on the fabric (2001).

Perspective is deeply connected to optics. It is the way we look at the world through a lens or a camera. However, human vision is different from a perspective drawing. Although correct perspective is drawn from a particular position in space, but as humans we move around and look at space from different viewpoints (Hockney 2001). Renaissance painters had knowledge of optics and lens-based vision. Lighting, detail in rendering, and foreshortening all indicate that artists were using optical devices (Hockney 2001). In comparison to Renaissance paintings, the Indian miniature paintings defy perspective, and seem to be less realistic and more awkward. One of the other

reasons for this sense of awkwardness is that as viewers our eyes are trained to expect perspective-based images typical to photography and film. Indian miniature paintings could be compared to Japanese and Chinese paintings, or to Egyptian hieroglyphs which are also based on alternate systems of representation.

Fig. 11(a) Detail from Umaid Singh on horseback, c.1820 (Crill, 2000)

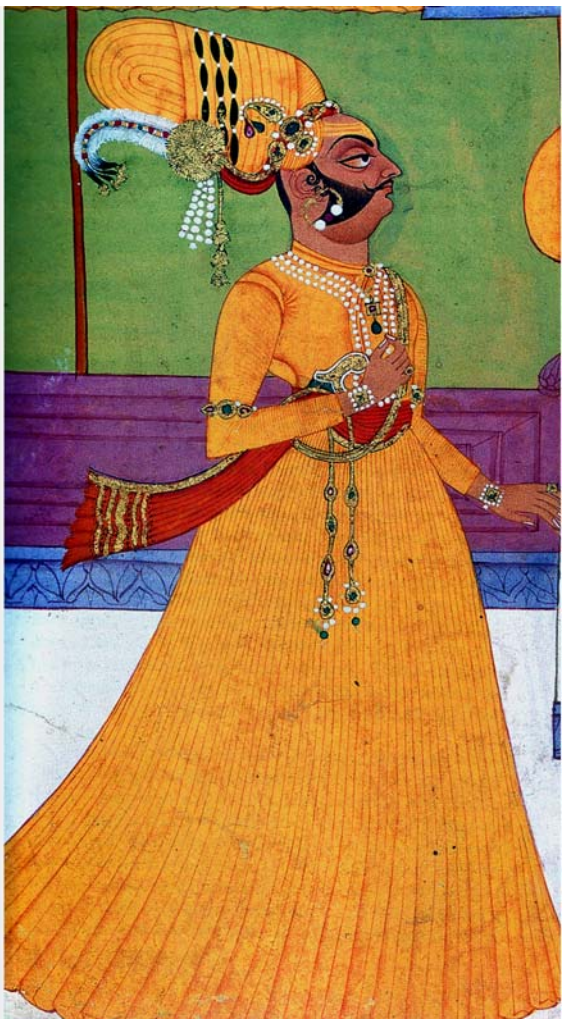

Fig. 11(b) Detail from The Month of Bahdra, c.1750-60 (Crill, 2000)

Fig. 12(a) Masolino da Panicale, c.1425 (from Hockney, 2001)

Fig. 12(b) Antonio and Piero del Pollaiuolo, c.1467-8 (from Hockney, 2001)

For instance, let us compare the paintings shown below. In Fig. 13 the buildings in the background do not follow linear perspective. The composition looks like a mural. Some of the terraces are big and some are small. It gives the impression of a city, but building masses are not convincingly proportioned. This painting may issue from the artist's imagination, and may not represent an existing cityscape. In comparison to this, the cityscape in Fig. 14 looks realistic. The parts of the building which are distant are smaller, the ones in front are larger and there is definite foreshortening. We find perspectival representation more believable because of our exposure to photography and films. We have seen many such cityscapes, and that is why this looks real, believable and convincing. Indian miniature paintings are representational of certain forms or images as the artist perceives and imagines them. The system of linear perspective or of using optical devices was not employed, and so these paintings look different in comparison to Western paintings, yet they possess a distinct style.

Interestingly, Indian miniature paintings, especially portraits, made after the 1850s were influenced by European studio photography. These paintings were different from the idealized paintings made by earlier court artists. A significant change brought by this impact was a shift from portraiture based on the subject's profile to the use of the full face (Crill 2000).

Fig. 13 Rukmini and entourage leave for the temple, c.1800 (from Pal, 2004)

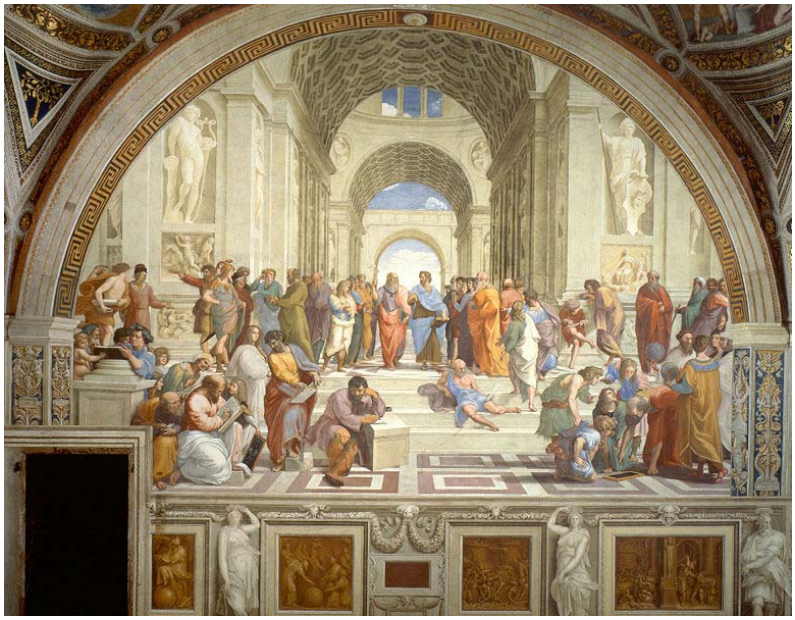

Fig.14 Raphael, The school of Athens, c.1510 (from www.flickr.com)

II.2Themes of Miniature Paintings

There are many themes for miniature paintings which can be primarily classified into two types – *ragmala* paintings and portrait paintings (Crill 2000). The *ragmala* paintings depict the different *ragas* or musical modes in classical Indian music. Each *raga* is about a different mood or emotion, and the paintings are a pictorial representation of these moods, or an expression of devotion or a familiar folk melody. The earlier *ragmala* paintings were very simple, and their relative sparseness works strongly in the overall effect. It gives the impression of simplicity rather than completeness (Figs. 1, 2). The genre combines three forms of artistic expression: classical music, poetry and painting (Pal 2004). In many of the paintings the two main characters, known as *nayak* (hero) and *nayika* (heroine), are Krishna and Radha (Fig. 8). In paintings of this type, love is the principle theme. The work also acquires a mystical nuance symbolic of the relationship between the soul and God (Pal 2004). Many of these paintings have verses written on them, either on the painting or on the back of the painting. Stories from classical Sanskrit epics, such as *Ramayana*, *Mahabharata* or *Purana* are depicted in several paintings. Sometimes a series of four or five paintings depict a story.

The second type is portraiture and the depiction of court life. This trend began as an attempt by the rulers to document their lineage or record important events. Initially the portraits followed the Mughal style of painting in which the king or the patron would be standing on a terrace or sitting on his throne. Later these portraits became more elaborate: a dignitary was shown in conversation with his courtiers or riding a palanquin

or even enjoying a dance performance (Figs. 6, 7, 15). This trend of documentary painting began in c.1640 and continued until photography replaced it in the late 19th century (Crill 2000).

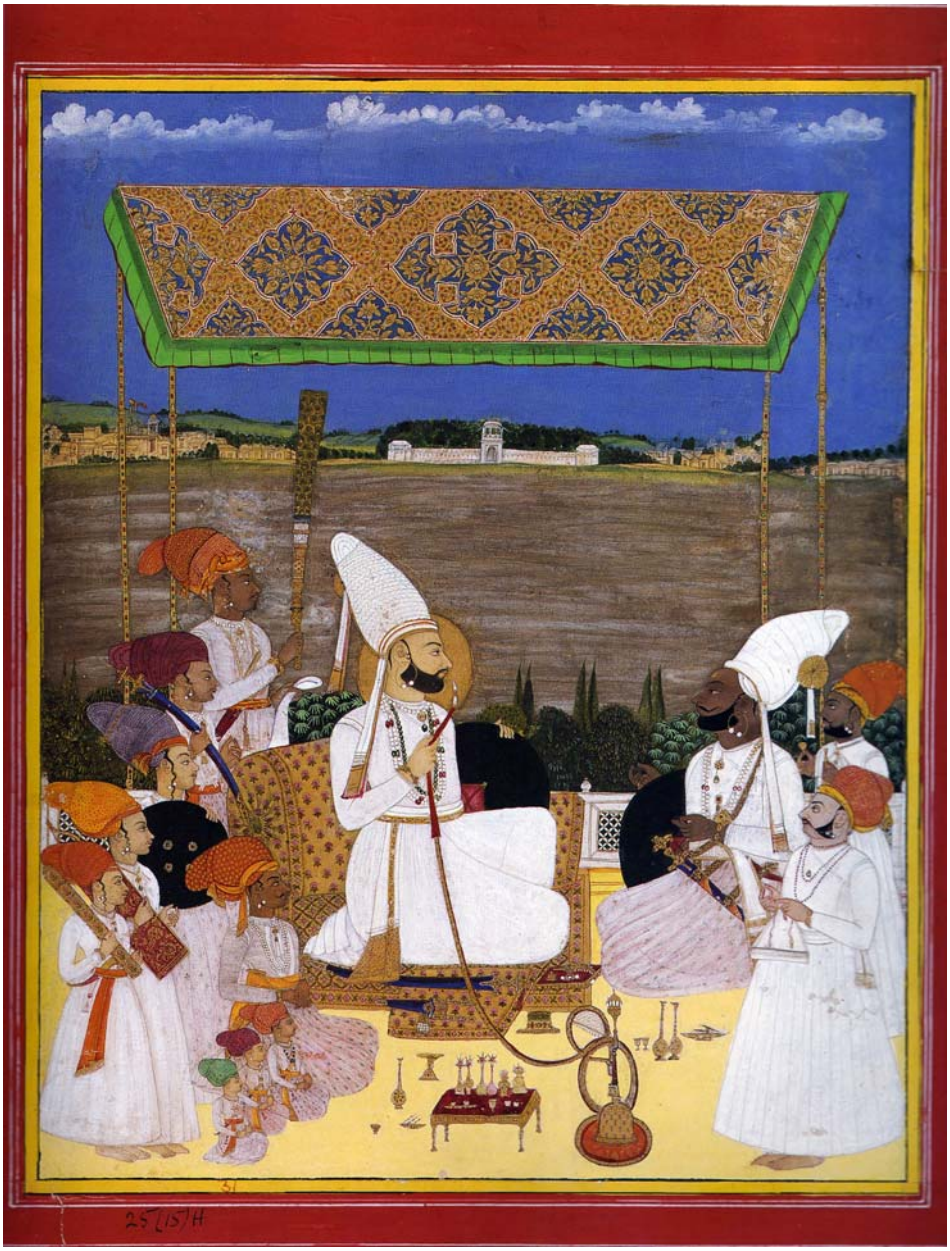

Fig. 15 Maharaja Ram Singh with Thakur Sher Singh, Mehrangarh Museum Trust, Jodhpur, c.1750 (from Crill, 2000)

Fig. 16 Krishna converses with a messenger, Ramesh and Urmil Kapoor Collection, c.1800 (from Pal, 2004)

CHAPTER III

RELATED WORKS BY OTHER ARTISTS

In this section I will discuss work by other artists that informs my creative work. “The Tale of How” which was created in 2007 by the Blackheart Gang, a team of musicians and artists, has been critically acclaimed and shown at several film festivals and exhibitions. This animation composites several layers of 2D illustrations, video footage and 3D objects, which blend seamlessly to create a spectacular composition (Figs. 17, 18). These artists followed a creative process similar to that which I used. They began by creating characters and environmental elements as pen and ink drawings, and then painted them. Several layers were drawn and composed together to create the environment. The idea was to create a unique aesthetic influenced by Oriental art and drawing. In the compositing stage, they used video footage for foamy sea waves, and also used several textures for the aged and worn-out look. 3D models were created for the tentacles, the dodos and other creatures. The shaders and textures used on these models were similar to the drawing style of the illustrations, and so they were skillfully composited together. In the final composition, every scene has about 300 different layers (Blackheart Gang 2007). The visual style of this animation is influenced by traditional Asian art. In contrast to my method, the artists composed the music first, and then worked on the visuals based on the lyrics and music. This animation contains a large environment in which all the action takes place, and the artists use a conventional editing

style for moving from one scene to another. My work will depict the environment in a continuous composition.

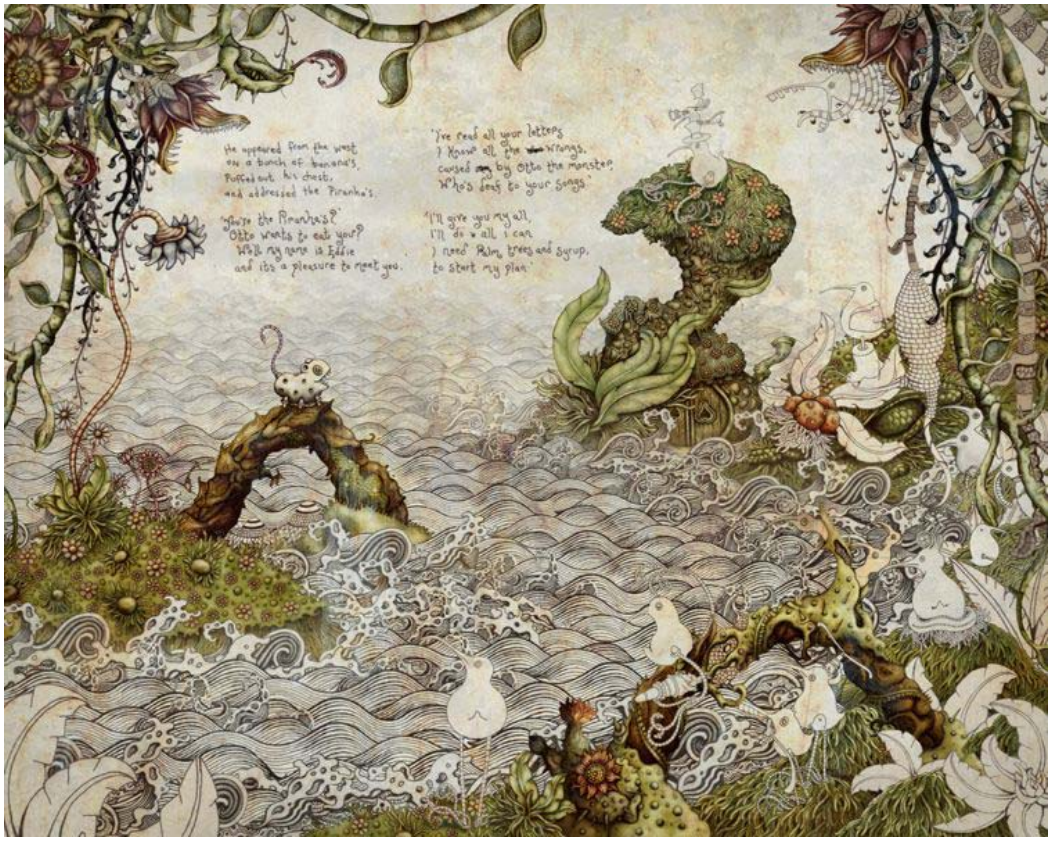

Fig. 17 A still from “Tale of How”

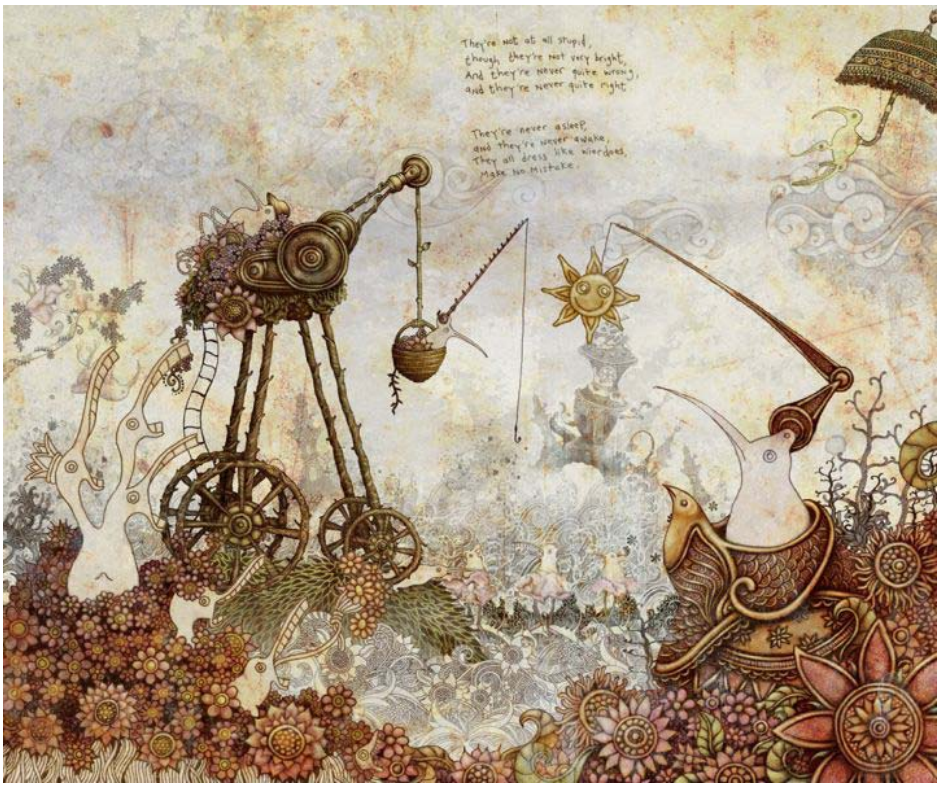

Fig. 18 Another still from “Tale of How”

The second example is “Into Pieces”, an animated short film by Guilherme Marcondes that was shown in SIGGRAPH’s Electronic Theatre in 2006. This film also uses illustration as a starting point for the animation. The artist begins with black and white drawings which are made into handmade paper cut-outs. An Adobe Photoshop ™ file is created with several layers and these 2D layers are placed in a 3D space (Fig. 19). These layers are then animated. The final composition is a combination of 2D layers, drawings and some photographs (Marcondes 2004). This method of working is similar to my methodology. The artist uses his own unique drawing style and he doesn’t seem to be

inspired by any traditional style. In the artist's words, "Spreading the flat cut-outs in 3D space gave the film that so called 2.5D look" (Ogden 2004).

Fig. 19 A still from "Into Pieces"

The third example is the animated film, "Printed Rainbow" created by Gitanjali Rao in 2006. This film has screened at 60 international film festivals, including Cannes Film Festival and Slamdance Film Festival. It uses traditional animation which has a strong Indian folk art influence, such as Mughal miniature paintings, Kalighat paintings of Bengal, street art, truck graphics and matchbox cover illustrations (Fig. 20). The

animation skillfully combines all the different art forms into an engaging visual treat (Rao 2006).

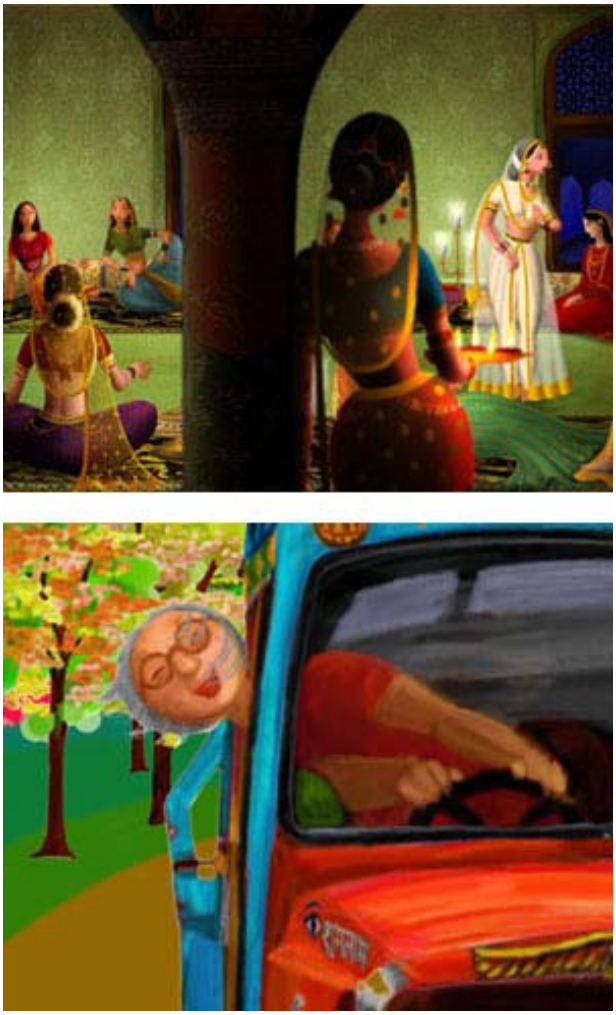

Fig. 20 Stills from “Printed Rainbow”

CHAPTER IV

METHODOLOGY:

THE MAKING OF "OPEN SKIES"

My objective was to work with Indian miniature paintings to create a unique visual style for an animation. The first step was to work on storyboarding to create a preliminary animatic of about one to two minutes. Sketches and story-boards helped determine which scenes and drawings could be created for the final animation.

IV.1 The Story

The story for this project revolves around a woman who is confined in her domestic space and has the desire to be free. We begin with a serene, beautifully landscaped garden. As we move across it, observing and imbibing its tranquility, we reach a *haveli* (a mansion) with a palace garden of beautiful bushes, trees, a pond, butterflies and pigeons. The individual trees, bushes and other elements are as detailed as the miniature paintings, but the layout of the garden is not as formal as a traditional Mughal garden. The state of Rajasthan has a desert climate with a sandy, barren landscape. The garden in this story is an idealized setting, not specific to that region.

As we move closer to the *haveli*, we see a woman sitting in a window. She has a stoic expression found in the portraits done in the miniature style. Visually she appears to be trapped, since she is enclosed by the window frame. A bird flutters across the window,

and as we follow the bird we move up into the sky, where there a lot of colorful kites. Kites flying in the open skies symbolize freedom in contrast to the woman's trapped condition. She truly aspires to freedom, like a bird or a kite. Then we see a kite falling and continuing to fall until it gets stuck on a tree branch. By this time the woman is on her front terrace. On seeing the fluttering kite, she approaches and releases it. As we move closer to her face, we see a soft smile. There is a ray of hope. Her action of releasing the kite symbolizes that though she seems to be trapped in a situation, she is willing to free herself, or help others who are stuck in similar situations.

IV.2 Initial Work for Visual Style

After I had the preliminary story, I started experimenting with the visual look of the animation. My first idea was to combine 3D objects and 2D textures. Since I had many trees in my composition, I started with a tree model. I modeled a tree trunk with a few branches and applied a simple shader to it using the software Alias Maya 7^{TM}. For the leaves, I created 2D planes with a simple painted-leaf texture on them. Below is an image from the rendered tree model (Fig. 21).

Although I liked the look of the tree from these preliminary test images, I realized that this was going to look like any other 3D production done with painted textures. Digital textures show regularity when they are repeated, whereas miniature paintings have the characteristic of irregularity, as they are created by hand. Even when patterns are repeated in the paintings, the repetition is irregular and non-uniform since they are done

by hand. This is the unique character I was looking for. The method of modeling and texturing was successful, but it did not fulfill my artistic intentions. I wanted to do something different where the visual style would be unique and clearly inspired from Indian miniature paintings.

Fig. 21 A render of the tree-model done in Alias Maya 7

The second approach involved creating drawings by hand and using them as textures on 2D planes in a 3D environment, again created in Alias Maya 7. The textures were “tag image file format” (.tiff) images with an alpha channel. This ensured that the textures had a high resolution and also contained transparency information.

As I was working on this project I realized the importance of getting constant visual feedback as the work progresses. This process can be compared to the process of creating a painting where the artist is constantly looking at the work, analyzing it and making the next judgment call. There were some problems in this method. I could not view all the planes with their textures in the Alias Maya 7 camera viewport; sometimes textures were not displayed with transparency. This was very distracting, and the workflow was interrupted. Another problem was that it took a very long time to render the scenes. Previewing the initial renderings was an important step in my process. I wanted to see if I was satisfied with the final visual style of my animation. This was in the preliminary stage, and I knew that several layers and textures would be added subsequently. I was facing two problems. One was viewing the 2D planes in the Alias Maya 7 camera viewport, and the other was quick rendering of the animation for preview purposes. Therefore this method of importing 2D textures into a 3D scene was unsuccessful. I had to find a method by which I could address and solve both these issues. Using Alias Maya 7 for this project did not seem to be a viable option.

After these trials, I thought of using Adobe After Effects ™ with its feature of 3D layers. I made a painting in the miniature style with a hilly terrain with trees and bushes in the foreground and the city in the background using Adobe Photoshop ™ (Fig. 22). Then I cut the painting into different layers. Each hill of the terrain was put in a different layer, and so were the trees, pond and other elements. I imported these as 3D layers in the After Effects composition. I placed them at a certain distance from each other in the scene. I then created a camera in the scene. I tested moving the camera from the foreground towards the city wall. As the camera was moving, I animated the trees and the water texture. When I played this test animation, I liked the visual effect. This animation achieved the visual style that I had in mind. It was created from the painting and all the layers in this composition looked like flat, 2D layers, but since they were placed in a 3D space at a certain distance from each other, the effect achieved was not like a 2D animation, nor was it like a 3D animation. This kind of style is now known as “two-and-a-half D” (2.5D) animation.

Fig. 22 Painting created using Adobe Photoshop

IV.3 Two-and-half-D Animation (2.5D)

2.5D is a term used to describe a 3D scene built completely or partially from a composite of 2D images or planes. The 2D images are animated in this 3D space, but since the objects are not three-dimensional, it is not referred to as 3D animation. At the same time it is different from traditional 2D animation. Since these 2D planes are placed in a 3D space, as we move through the scene, we experience depth. This technique of animation is also sometimes referred to as “postcards in space”. At times this is compared to the style of a pop-up book.

IV.4 Methodology Used for the Project

After the test using 3D layers in Adobe After Effects, I decided this was the most efficient method to use for my animation. By this time I also had a preliminary story-board animatic, so I started composing scenes for the animation. I began by creating textures for the scenes. I made drawings of the trees, bushes, grass, flowers, railing wall and other landscape elements by referencing the Indian miniature painting style. I referred to the paintings to examine the foliage, the level of detail used, the colors, shading and so on. To a certain extent, I duplicated the drawing method. I first made the drawings on paper using pen and ink (Fig. 23). I then scanned the drawings and painted and shaded them using Adobe Photoshop (Fig. 24).

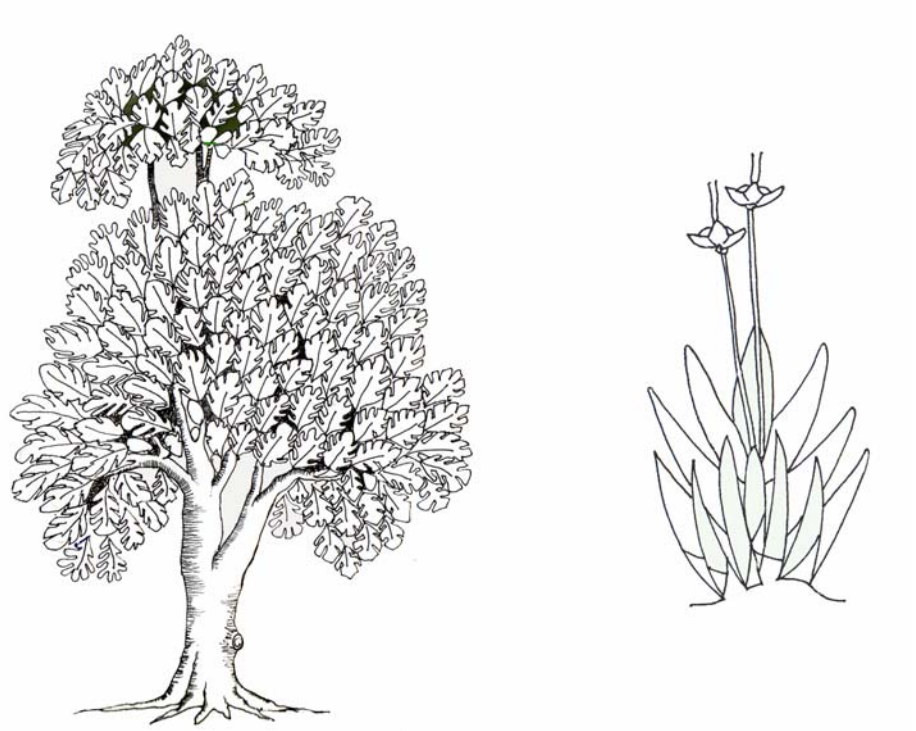

Fig. 23 Pen and ink drawings of tree and shrub

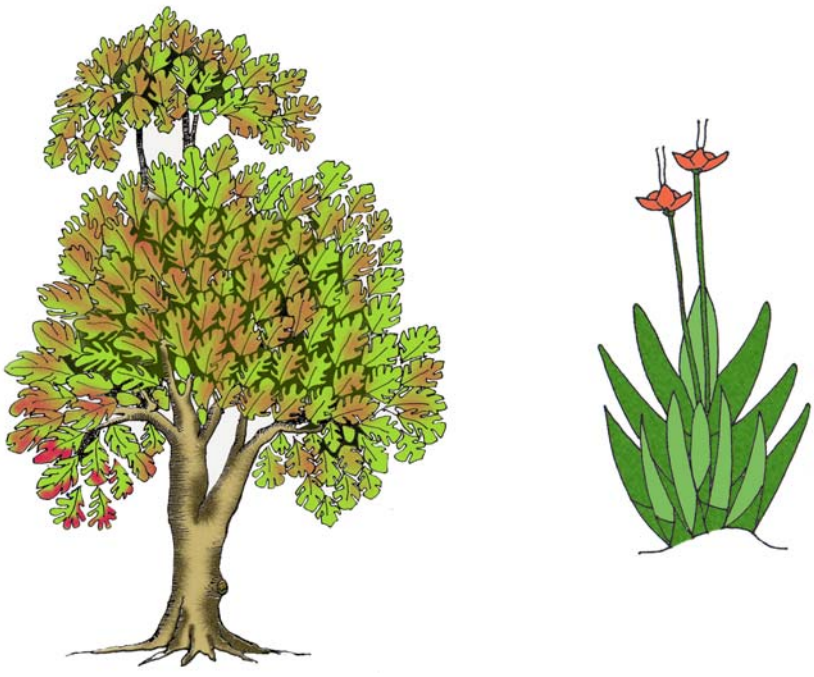

Fig. 24 Pen and ink drawings painted using Adobe Photoshop

I thought I could perhaps use painted drawings instead of painting in Adobe Photoshop. I tried to paint some of the drawings using water colors, but I did not like the results. I decided to use Adobe Photoshop as my medium of painting, as I was more comfortable with it. These are some of the textures that I have used in the final animation (Figs. 25, 26, 27):

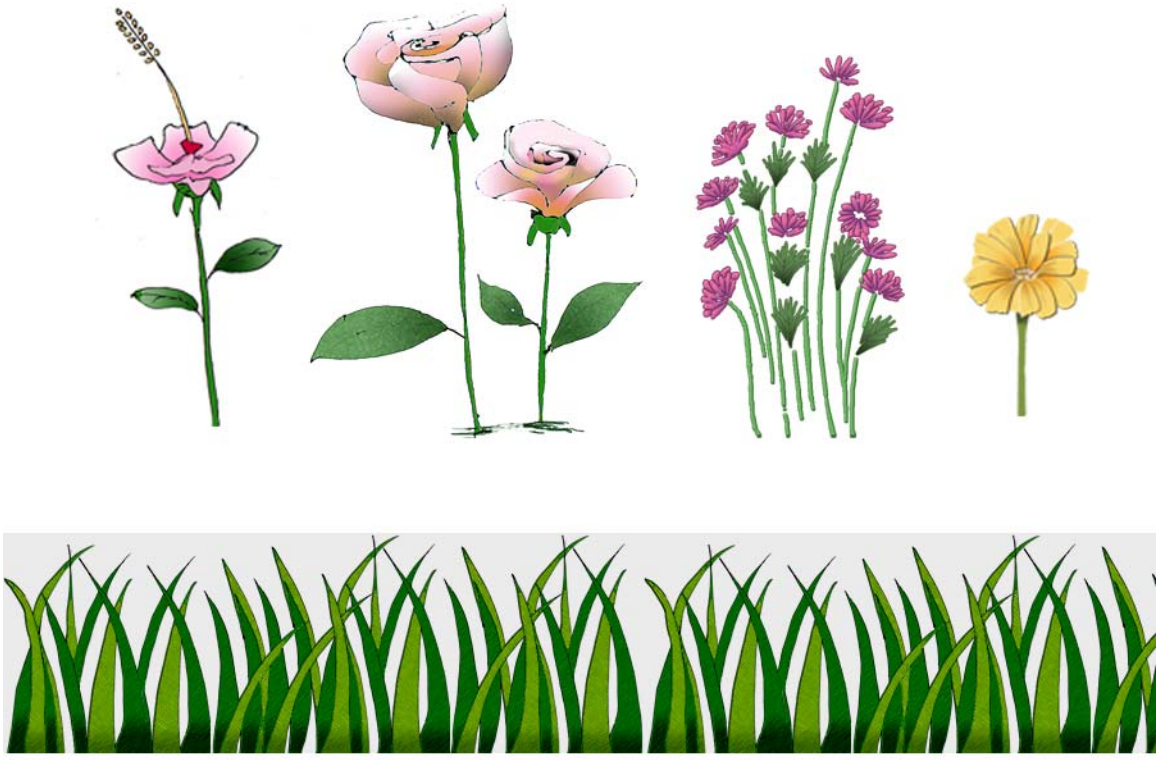

Fig. 25 Different types of flowers and foliage created for the project

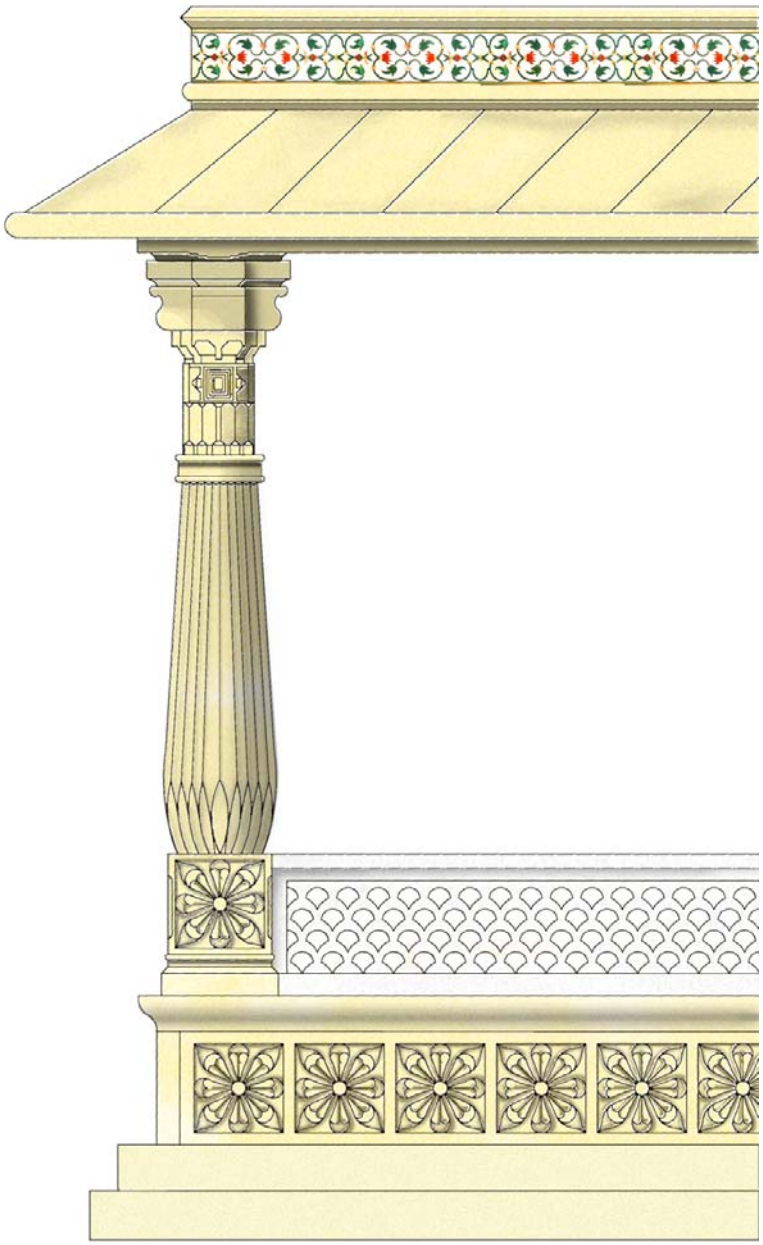

Fig. 26 Architectural detail of the pavilion used in the After Effects composition

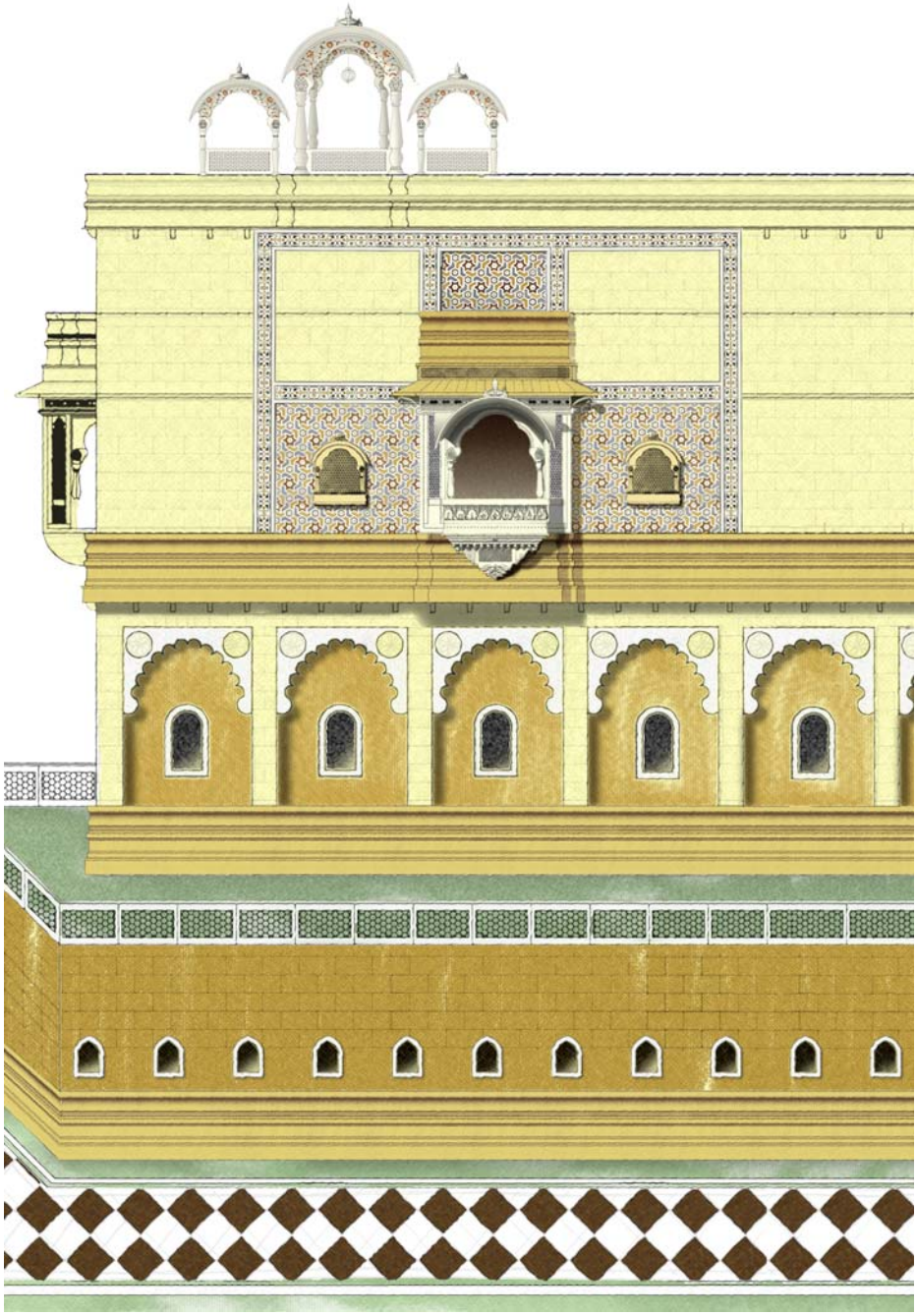

Fig. 27 The *haveli* (palace) drawing used in the After Effects composition

As I was creating drawings for all the different elements in the scene, I was also working on improving the story. I was storyboarding and creating animatics so that I would know exactly how to compose the final scene and animate it. While developing the visual style inspired from Indian miniature paintings, I was also interested in developing a cohesive and meaningful short story.

I started composing each scene with the textures, and placing them relative to the camera (Fig. 28). I blocked out the camera movement, which turned out to be an important step in the process as there were several issues to be addressed. An important issue involved moving the camera at the right pace so that all the details in the textures would be clearly visible. If the camera was too fast, it looked disturbing because the textures are complicated and detailed and to view them precisely (or to avoid “crawling”) the camera has to move slowly. Another issue was the relative movement of the textures. As the textures are highly detailed, the color value changes from pixel to pixel. As the camera moves, these textures overlap each other or move across each other. If they move too fast, it is again visually disturbing. Therefore adjusting the speed of the camera in relation to the textures was done several times till the desired speed was achieved. This was a process of trial and error. Each time I would render out a part of the scene, view it, and show it to others. The feedback that I got from my peers and my advisor was critical at this stage of the process.

The third issue was the direction of the camera movement. I tried to move the camera across the composition more or less parallel to the 2D texture planes. This looked fine but not really interesting as the depth of the scene was not obvious. When I tried to move the camera into the scene, perpendicular to the 2D texture planes, it only worked for a certain distance. At times the trees appeared to be sliding across the terrain and I realized that the direction and speed of the camera's movement had to be timed correctly. This step again took a long time. I had to recompose the scene with the textures and accurately time the camera's movement in relation to these textures. After several iterations the scene was composed to my satisfaction.

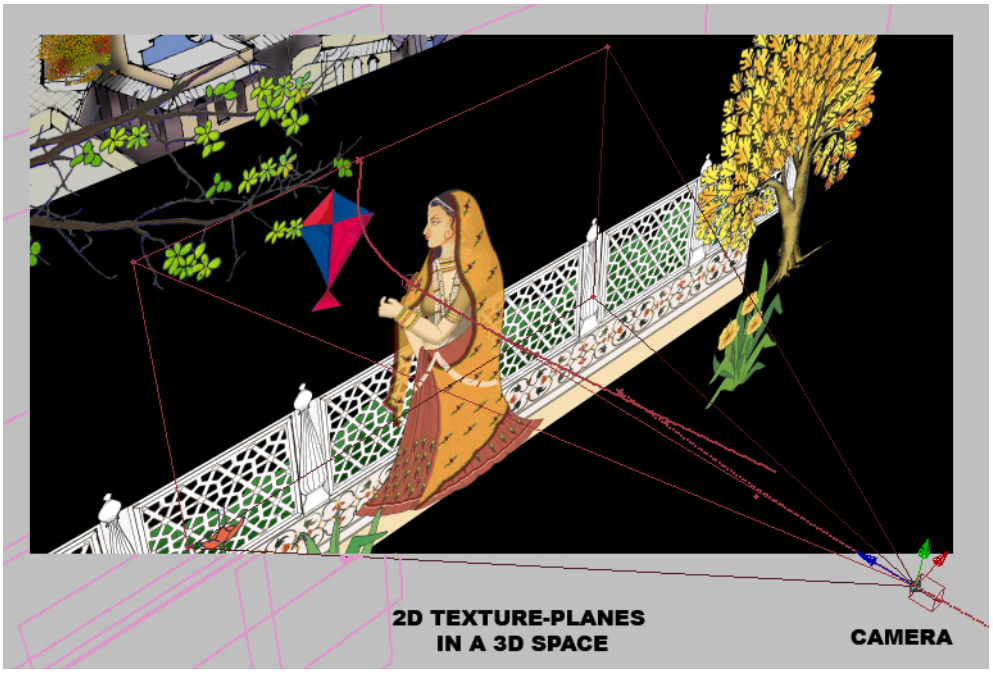

Fig. 28 Screenshot of the different layers in Adobe After Effects camera viewport

The next step was to edit together different scenes to convey the story. As I was doing this and showing it to my colleagues for critique, I got some interesting feedback. Most people felt that since this visual style is inspired from miniature paintings, I should try to avoid cuts as the story progresses. This was a valuable suggestion. Until then, I was only using the style of drawing as the guideline for my visual style, but if I made this a continuous composition without any breaks it would make my final animation look like a journey through a painting.

Miniature paintings have very fine detail and the paintings are small in size. A viewer usually looks at the painting closely and concentrates on certain areas. The eye of the viewer moves around the painting scanning each detail. My animation mimics this method of viewing. The camera moves along the composition in a similar way to movement of a viewer's eye across the miniature painting. As the camera moves slowly, the audience observes each detailed texture even as the camera movement advances the story.

After I had established the position of the camera and other 2D objects such as foliage, palace, and flowers, I added secondary movement to some of the elements in the scene. I added a little movement in the tree branches, the grass and flowers. I also included butterflies in the scene. This made the garden come alive. It did not look as static as it was before. The movement is subtle and only created for some objects. This was done

because the scene has many textures; if all of them move, it could be disturbing for the viewer.

The Adobe After Effects file already had several layers in it, and I did not want to add several more layers for each tree or bush as it would require key-framing these different layers. To make things simple and organized, I created separate animations of the trees, butterflies and other objects. First, I decided which part of the bush would move, then I created separate “portable network graphics” (.png) files of these different parts (Fig. 29). By making a .png file I could have the alpha channel information (for transparency) in the same file. Then I imported these different .png files into a new composition. I animated the separate layers, using key frames. Next I rendered a Quicktime ™ movie file, using the “Millions of colors+” setting (Fig. 30). By using this setting, the rendered file was saved with the alpha channel. When this Quicktime movie file was imported into the final composition, it brought the transparency information with it. This became a new 3D layer in the final After Effects composition. This has been illustrated in the following images:

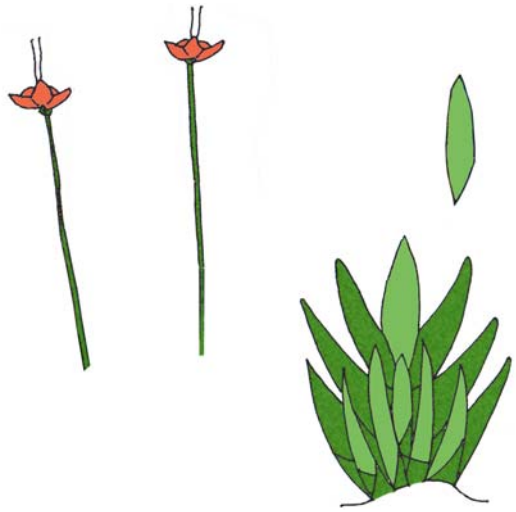

Fig. 29 Different parts of the bush imported into Adobe After Effects composition as separate .png files

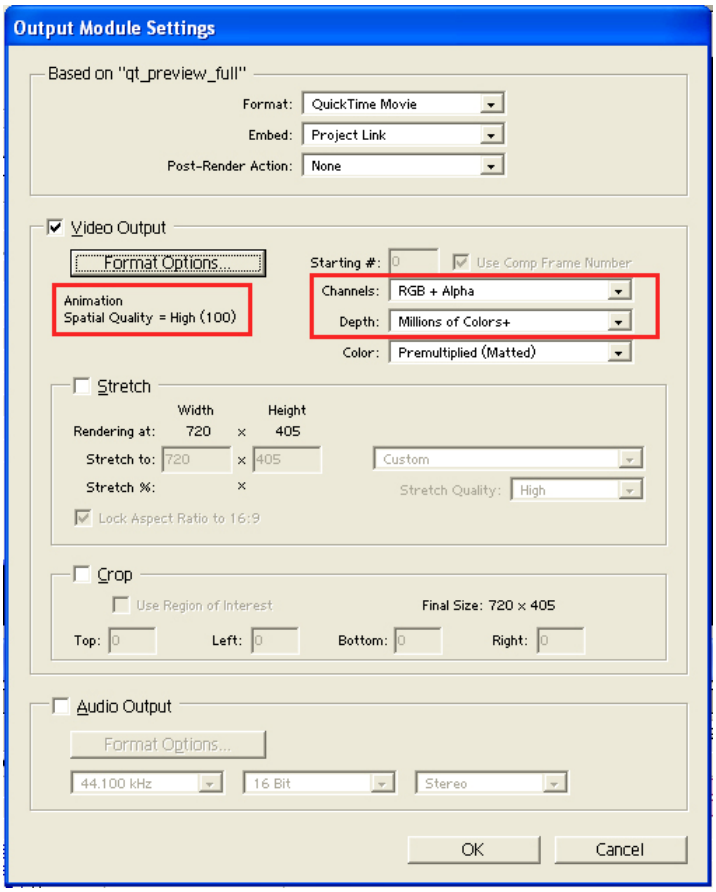

Fig. 30 Screenshot of the settings used to render the Quicktime movie file

After I finished the animations, I rendered out test movie files to see if everything was aligned correctly, if the animation speed was correct, and if everything looked cohesive as a composition. If any changes were required, I went back to the individual animation files and made the changes and re-imported the new Quicktime movie into the final composition.

Music was an important part of this project. I wanted a musical composition that complemented the aesthetics and used Indian musical instruments. A friend of mine, Amnaya Awasthi, composed the music for this project by using Indian musical instruments such as sitar, tanpura (string instrument) and flute for this composition. He listened to Rajasthani music and studied the kind of sounds and instruments used in their compositions before he began composing. We had several iterations before he finalized the musical composition for this project.

IV.5 Rendering

Rendering the final animation is also a very important step of my project. I wanted to have separate uncompressed video and audio files. As per the requirement, these files could be compressed. For the video, I first rendered an uncompressed Quicktime movie in the wide-screen format (720 x 405) from the Adobe After Effects composition. This movie was with the highest resolution and had all the information, but since it was uncompressed it would not playback in real time. Using the uncompressed movie, I created separate movie files depending on how it will be played. For the computer, I

used the Sorenson-3 compression and created a Quicktime movie which can playback in real time, and also did not have compression artifacts. For the DVD version, I created a "moving picture expert group" (mpeg-2) movie file. I used a bit rate of 8.2, which gives me the best possible mpeg-2 movie file, with the least amount of compression. I rendered a separate uncompressed waveform (.wav) audio file from the Adobe After Effects composition. For the DVD version, I created the compressed waveform (.wav) file.

After the animation and music were finalized, I added the titles and credits and completed the project. This final project demonstrates one of the ways of interpreting Indian miniature paintings into a time-based media animation.

IV.6 Challenges Faced During the Project

There were several challenges at different stages that I faced while I was working on the project for my thesis.

The first challenge occurred while I was composing the scenes for each sequence with 2D drawings that I had created based on the miniature paintings. Each individual detailed drawing with fine textures was made separately. Since the miniatures used bold and bright colors, the drawings that I created also had saturated colors. But when these drawings were composed together, I had to make sure that the colors complemented each other and were not overpowering. It had to look like a harmonious, balanced

composition. I had to also maintain a balance between the foreground and background colors in terms of saturation and value. The elements in the foreground had to be more saturated than those in the background which had a lower color value. Even though I was altering spatial perspective, this use of atmospheric perspective was necessary to a time-based viewing experience. Contrast between the foreground and background allows the eye to focus on objects in the foreground where the action takes place. In some instances, I had to redo some drawings and adjust the color values after assessing the shots in the composition. This was an important step in achieving the desired results.

The other challenge involved adjusting the speed of the animation. The camera in the composition had to move at the right pace so that all the details in the textures were clearly visible. As the drawings were complicated and intricate, the camera had to move slowly. If it moved fast, the patterns overlapped each other, and it became disturbing to the viewer. The color values changed from pixel to pixel, and fast movement was not desirable to observe everything in the scene. Therefore, I had to strike the right balance between the pace of the movement of the camera and the progression of the story.

Another challenge was maintaining continuity and conveying the sense of space through the narration of the story. This animation has been treated as one continuous composition: the story unfolds in one long take. As I created the composition, I had to convey the sense of space as we moved from the garden to the palace and then to the front terrace. The layout of the scene was important to get the feel of this environment

and also to ensure that the sequence was not too long and uninteresting. I had to make this transition slow, effective and interesting. I also had to maintain continuity as we moved along with the kite from one scene to the next. In order to do this, the layout of the whole environment played an important role.

Another important aspect of this project was to keep a cohesive visual style throughout the animation. All the different objects and elements in the composition were made as separate drawings, so that they could be detailed and edited individually and could be brought together to create the composition. It was important to keep a consistent visual style so that the final composition would be cohesive. For instance, each tree had its individual character, type of foliage, color and texture, but at the same time all the trees belonged to the same garden. To achieve this I had to create several drawings and choose the type of elements that blended well with each other and looked consistent. I also had to refer to the paintings constantly to see how they achieved cohesiveness in spite of their different elements.

CHAPTER V

CONCLUSIONS

This research and the resulting project are meant to show how the traditional art form of Indian miniature paintings can be used in a digital medium to create a new visual style for animation. The resulting project also demonstrates how a consistent look can be achieved without following conventional 3D perspective, but can instead be inspired by the method of representation in Indian miniature paintings. The implementation procedures for this project yielded results that are consistent with the goals of the research, while providing several strong insights throughout the production process.

Indian miniature paintings were my source of inspiration because of their distinct method of representation which is very different from the perspectival conventions in photography or film. In my creative process, I began by adapting the style of pen and ink drawing. I observed the way of depicting foliage, human figures, architectural details and other elements. The drawings created for my production were very similar to the paintings in style, pattern and overall look. I used a different method of coloring, shading and rendering which made the work distinct and not a copy of the original. I was using the computer as my tool, unlike the original painters who used a set of conventional tools. My medium was digital, and their medium was paint on paper. By bringing the painting into a digitized form, I created a unique aesthetic clearly inspired by the style of painting.

These paintings were held close to the face, and admired for their intricate detailing and patterning. In my project, I try to mimic this method of viewing the paintings. I move slowly across my animation, giving the viewer a chance to absorb the rich detailed drawings, and get immersed into the environment created. I am not just following the method of drawing, but I am also enhancing the experience by following the same method of observing the paintings. This slow movement is different form the conventional style of animation which has fast-cuts and a much faster pace of movement. The experience is also enhanced by traditional music of India.

In conclusion, this thesis and the resulting project provide a new method of integrating the traditional art form of Indian miniature paintings with a digital medium. The project is a new visual style for animation which is different from conventional animation. The project is a 2.5D animation which gives the viewer an experience of 3D space without the use of 3D objects. The resulting research provides a foundation for further exploration into different methods of integrating other traditional art forms with digital media.

A Movie file (.mov) accompanies this thesis as a file available for downloading.

CHAPTER VI

IMPLICATIONS FOR FUTURE WORK

The implications of this research and the project are limited to 2.5 D animation. This is the kind of look that I achieved since I was using Indian miniature paintings as my reference. However this kind of work can be done using other regional art forms such as Chinese paintings, Egyptian paintings, or African folk art. Future research need not be limited to 2D or 2.5D. One can explore the possibility of using a style of painting, or implementing a stylistic vision for a 3D animation project. This will open up many new possibilities and can produce exciting results.

Another possibility for research is to study paintings of artists such as Rembrandt, Goya, Manet, Hopper or any other particular style of painting. An exploration of the technique used by the artist to create his artwork can be used in a digital production. Artists often employ a specific technique to make their work believable. This method can be researched and explored because the creative process for any artistic work is often ignored. This can be a useful knowledge for other artists and creators.

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