CINE-ANIMÉ: ADAPTATIONS OF REALISTIC LIGHTING STYLES

A Thesis

by

ELLEN MAN NGOC TRINH

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

August 2005

Major Subject: Visualization Sciences

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Approved by:

Chair of Committee,	Carol LaFayette
Committee Members,	Ergun Akleman
	Daniel Koetting
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ABSTRACT

Cine-Animé: Adaptations of Realistic

Lighting Styles. (August 2005)

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Chair of Advisory Committee: Prof. Carol LaFayette

Animé, a style of Japanese animation, has begun to evolve into more than a simple animation. The stories found in animé have reached a level of complexity similar to traditional cinema. However, lighting in animé, has been minimal. Using computers to create animé, rather than creating it traditionally by hand, has allowed greater opportunities to be creative with lighting. Color and computer-generated (CG) effects can be integrated with traditional line drawings to create beautiful images in animé. Since cinematic lighting exhibits some of the finest examples of lighting, this thesis will analyze lighting styles from three different cinematographers and adapt them to three animé style scenes in 3D. The scenes will be modeled, lit, and rendered using *Alias/Wavefront MAYA*™, and textured using *Adobe Photoshop*™. The result will be a visual CG piece that adapts the lighting style of certain distinctive cinematographers, while retaining the look of animé.

To my family and friends

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CHAPTER I

INTRODUCTION

I.1. Origins of Animé

Animé is a style of animation originating from Japan. The word animé comes from the French word "dessins animés" which means "animated." [4] Animé arose during World War II in a generation of artists who largely ignored its horrors by creating characters who transported these tough realities into the realm of cartoon fantasy. "In childlike animated forms, anguished truths were stripped of their historical context," [21] through a flattening process that "released both the artist and the viewer from grappling with the contradictions of Japan's wartime experience as predator and victim and postwar status as economic rival of, and political subordinate to, the United States." [21] In an effort to produce moving pictures from manga, animé, a genre of Japanese comic, was created. When manga series become popular, they are produced as animations. Thus animé developed from its readers' desire to watch an animation based on manga stories.

Technically animé in Japan refers to any animated film. Yet, animé in the United States refers specifically to Japanese animation [19]. Since "the Japanese did not have a financially successful and internationally known live action movie industry like their American counterparts," animé possessed complex genres not found in Western animation [25]. These genres include: science fiction, romance, comedy, horror, sports, tragedy, adventure, even psychological probing of a kind [25]. Furthermore, Western audiences are accustomed to seeing these genres in live action films, not in animation.

The journal model is *IEEE Transactions on Visualization and Computer Graphics*.

Animé became easily recognizable worldwide and became an alternative to cinematic films. In addition, "the visual style of animé has provided a unique cinematic appeal that distinguishes it from other animation." [25] "The drawing style of the line art, character designs, narrative themes, animation techniques, shot compositing, lighting techniques, and special effects" all contributed to the visual style of animé [25]. Moreover, different visual styles can be found under each genre. For instance, some animé have a cute appearance to them where the characters have huge eyes and plump-looking hands and feet. There are other animé that look more realistic such that the characters' bodies look more proportional to a human's and the eyes are small and de-emphasized.

Although the drawing style of animé is one of the main visual characteristics that distinguish animé from other animations, the lighting style of an animé distinguishes one animé from one another. Typically lighting in animé is minimal and de-emphasized. Thus the lighting in animé looks flat and ambient, with no distinct style; however, a creator of Japanese animation, Makoto Shinkai, recently showed that beautiful lighting can be created in animé. His lighting style is reminiscent of cinematic films. Similar to a cinematographer, he uses color and light to help set the mood of his animated films.

I.2. Definition of Cinematography

In American cinema, there are films that have a distinct visual style that can be attributed to both the cinematographer, or director of photography, and the director of the film [32]. "While the director is the author of the performances of the film [and] the story of the film, the cinematographer is the author of the use of light of the film and how it contributes to the story." [3] The cinematographer helps and supports

"the director in getting exactly what he wants even when the director is not fully able to articulate it himself." [32] The cinematographer ensures that the overall tone and style of the film is consistent through lighting and composition. Thus, when a cinematographer sets up the lighting in a scene, there are two points he or she keeps in mind: the quantity of light and the quality of light.

Attention to the quantity of light ensures that a sufficient amount of light illuminates the scene. Attention to the quality of light brings out the following values: orientation, mood or feeling, aesthetic pleasure, and depth and perspective. The orientation of the camera is like the eye of the viewer [2]. The viewer sees whatever the camera sees. Orientation creates emphasis and informs the viewer as to when and where the story takes place. Therefore, the cinematographer can direct a viewers attention within that orientation by lighting areas of the screen brighter than other areas to help the viewer focus his or her attention where it was intended. It is the cinematographer's task to setup the lights and camera according to what he or she visualizes from a photographic point of view determined by lights and the moods of different scenes [2]. This leads to the mood or feeling of lighting being able to evoke emotions in the viewer. For example, seasons or the time of day can be interpreted from the lighting in a scene. Attention to aesthetics makes the scene visually appealing. For example, musical comedies using gorgeously lit settings lead the audience into a dream world. Lighting can also create depth and perspective to enhance three-dimensionality. The appropriate distribution of lights and shadows help to create the illusion of three dimensions, or photographic depth. The progression of dark to light, and light to dark on the screen continues to help create the depth. Thus, quantity and quality of light are main objectives in lighting a scene [2].

After determining the best lighting scheme based on the director's intent, the cinematographer composes and lights the shot with the director's approval. The

cinematographer decides how to orient the camera and the lights in order to evoke a particular mood.

Cinematographers are artists who work in the film industry who must possess an eye for lighting and composition. There can be many choices of visual style when it comes to creating the look of a film. Depending on the director and the artistry of the cinematographer, some films have very distinctive visual styles. For example, Gregg Toland's work in *Citizen Kane* (1941) [30] show a very powerful way to use light to enhance the story. Toland creates depth in many scenes by lighting the foreground subjects darker than the background subjects, and vice versa. Consequently, the viewer's attention is directed toward the brighter part of the screen, which allows the viewer to focus on the area Toland intended to emphasize.

I.3. Statement of Intent

While the animé story has reached a level of complexity similar to that of traditional cinema, animé lighting has not changed a great deal over the years. For the most part, the lighting style in animé appears visually uniform from one work to the next. Thus applying classic cinematic lighting to an animé scene will help animé continue to evolve. Since traditional cinema appears three-dimensional visually, modeling the animé scene in 3D will help animé achieve the dimensionality of cinema. Furthermore, the creation of an animé scene in 3D is consistent with animé's evolution into a cinematic genre.

The goal of this thesis is to create three animé style scenes in 3D with adaptations of lighting from differing cinematic styles. By analyzing the characteristics of animé lighting styles, the look of animé will be preserved. By analyzing the characteristics of cinematic styles, the look of cinematic lighting will be achieved. The result will be

computer-generated (CG) scenes that adapt the lighting style of certain distinctive cinematographers. The look of animé will be interpreted through modeling, while the cinematic styles will be interpreted through CG lighting.

CHAPTER II

BACKGROUND

II.1. Animé in CG

Japanese animation, or animé, has been traditionally drawn by hand. Since animé can be attributed to manga, which in its simplest form is line drawing, aesthetically, animé appears flat due to the lack of spatial perspective [21]. Now, however, more studios are experimenting with creating animé characters in CG and compositing them into 2D, 2 $^{1}/_{2}$ D, and 3D scenes. An example of an animé with 2 $^{1}/_{2}$ D scenes is *FLCL* (2000) [15]. In one of the scenes, a character is modeled and textured to resemble a traditionally drawn animé; nevertheless the scene contains a series of camera movements that include a fast zoom towards the character followed by a 360-degree spin around the character. As part of the supplement to one of the DVDs, there is a clip that shows the wireframe of this scene to demonstrate that CG was used to achieve the dynamic camera movement. On the other hand, characters could be traditionally drawn while the backgrounds are created using CG. The first feature-length animé film to rely extensively on this method was *Blood: The Last Vampire* (2001) [18]. The characters were traditionally drawn by hand, but then digitally inked-and-painted [18]. The compositing of the hand-drawn characters and hyper-photo-real backgrounds that included lighting effects added to the realism of the animé film. An example of an animé produced completely in 3D is a feature film titled, *Final Fantasy: The Spirits Within* (2001) [11]. The CG texturing and lighting created in the film contributed to its successful visual style. Thus lighting can be as effective in animé as it is in cinematic films.

II.2. Cinematography Styles - Classic Film Lighting

Many cinematography styles can be found in films; however, certain styles are more distinguished than others. Among the more famous include Gregg Toland's visual eye in *Citizen Kane*; Vittorio Storaro's beautiful work using seasonal colors in *The Conformist* (1972) [22]; Gordon Willis's darkly lit scenes and somber color schemes in *The Godfather* (1972) [27], and *The Godfather Part II* (1974) [28]; Nestor Almendros's visual feast in *Days of Heaven* (1978) [26], which showcases scenes filmed during "magic hour," the time immediately after sunset before it becomes dark [5].

II.3. Film Noir in CG

CG environments can be a useful tool in exploring elements of film styles. Recently, a colleague, Han Lei, presented his thesis on Film Noir in the Visualization Sciences Program at Texas A&M University. In his thesis, he discussed the characteristics of Film Noir, and then created a short animation in CG that adapted the "look" of Film Noir by exhibiting hard, intense lighting [20]. By analyzing several Noir films and adapting the Film Noir lighting style in his animation, Lei shows that the look of the Film Noir lighting style can be reproduced in the CG environment.

The visually appealing characteristics of animé, coupled with the lighting styles of brilliant cinematographers can make interesting combinations for experimentation.

CHAPTER III

PRELIMINARY RESEARCH

Seven films involving more well-known cinematographers were viewed and certain aspects of the lighting were noted. The lighting styles of three cinematographers were chosen for their distinct visual styles to be adapted to an animé style. Simultaneously, a number of animé were also viewed and noted for characteristic lighting styles. After determining which three films were used as reference, some scenes were chosen for further analysis. In analyzing scenes, some main qualities of light were noted. The first quality examined was whether the light was high key or low key. Scenes that are brightly lit are considered high key, while scenes that are darkly lit are considered low key. Comedies tend to be lit in high key, while mysteries tend to be lit in low key. The second quality examined was whether the light was hard or soft. There are two factors that determine the hardness or softness of light. One factor involves the size of the incoming light source in relation to the distance of the light from the subject: the larger the light source, the softer the shadows, because the light is spread out. The other factor involves determining whether the light is specular or diffuse. Diffuse light is scattered across a surface in many directions, while specular light comes from one direction and does not scatter. While diffuse light tends to appear soft, specular light tends to appear hard. The third quality examined was whether the light was sourcey or ambient. The light is sourcey if the origin of light is visible in a scene, for example, light coming from a lamp on a table. The light is ambient if the origin of light is not visible in a scene, for example, if a room looks well lit even though there are no visible light sources [10]. In addition to the qualities of light, the colors of the scenes chosen for reference were also noted since they can affect the feeling evoked

from the scenes.

After analysis of cinematographic lighting styles and researching visual characteristics of animé lighting, three CG scenes were modeled, textured, and lit. Since the main focus was on lighting, modeling and texturing was kept to a minimum. Animé style characteristics were interpreted with respect to modeling, and cinematography styles of three chosen scenes were adapted with respect to lighting. The objective was to model and texture the scene in a way that when viewed, a definite sense of the animé style was preserved. Furthermore, lighting invoked the style of a cinematographer whose distinctive aesthetic can be identified. To illustrate, it was interesting to see an animé-styled CG scene lit in the style of *The Godfather*. The subject had the large eyes and the unrealistic body design characteristic of an animé figure. There was an intense light coming from above, resulting in shadows on the eyes of the character. Viewers who have seen *The Godfather* were able to identify the lighting as a Gordon Willis scene.

The following sections will define the qualities of light: lighting ratio, hardness/softness of light, and sourcey/ambient. In addition, color, another quality of light, will be discussed. Furthermore, the visual characteristics of animé lighting will be examined.

III.1. Definition of Qualities of Light

III.1.1. Lighting Ratio

The first quality of light noted in the films viewed is the ratio of brightness between the key light and the fill light. The lighting ratio, or key-to-fill ratio, helps establish the mood of a scene [17]. It represents the difference between the brightness, or intensity, of the key light and the brightness of the fill light. The key light is defined

as the main light in the scene and is usually the brightest of all lights illuminating the subject [8]. The key light is the light that creates shadows. The fill light is defined as the light that fills in the dark areas not lit by the key light. In addition, the fill light is usually placed about 90-degrees away from, and lower than, the key light. In color production, the standard ratio between key light and fill light is 2:1 [23]. For example, if the key light has an intensity of 1, the fill light will have an intensity of 0.50. Usually high-key lighting in scenes has a low key-to-fill ratio. This indicates that the total intensities of all the fill lights in the scene are greater than the intensity of the key light. These scenes appear visually bright. Furthermore, the scenes do not have very many shadows since the brightness of the fill lights, lessen the darkness of the shadows created by the key light. On the other hand, scenes that have little or no fill and lots of shadow areas define low-key lighting. Thus, they have a high key-to-fill ratio because they appear high in contrast. An example of a high key-to-fill ratio may be 15:1. High-key lighting in scenes is easily found in comedies, while low-key scenes are more apparent in mysteries [8]. Thus, among the seven films viewed, most scenes in *Citizen Kane*, interior and night scenes in *The Godfather I, II, and III* (1990) [29], magic hour scenes in *Days of Heaven*, most scenes in *The Conformist*, night scenes in *Blue Velvet* (1986) [13], and initial scenes in *Prospero's Books* (1991) [24] are all low key.

III.1.2. Hardness/Softness of Light

The second quality of light noted in the films viewed is that of the hardness and softness of light. Light that emanates from a small source or a distance source is characterized as a hard light [8]. Hard lights tend to create sharp and abrupt shadows [10]. In addition, highlights on subjects illuminated by a hard light are typically

specular in nature and appear bright and crisp. Since specular light is comprised of light rays that run parallel to each other, they do not scatter in many directions when they hit the surface of an object. Hence, "specular light is highly directional and collimated." [8] The hardness of light can be easily observed on smooth objects, such as a billiard ball. The highlight on a billiard ball looks more focused on one spot rather than spread out. Light from the sun is also considered specular because the light rays are parallel. Furthermore, the light coming from the sun is also a hard light because the sun appears small due to its location millions of miles away.

A soft light is characterized by a large light source located closer to the subject. The larger the light source, "the more the light tends to 'wrap' around the contours of the subject," [10] due to the distance of the light in relation to the size of the light source: a soft light fills in shadows to create soft edges. Highlights created by a soft light are typically broader and less-focused [8]. The light is able to spread out and is diffused or scattered across the surface of an object in many directions. Diffuse light on a subject tends to appear soft. An overcast sky can soften hard light, making it soft [8]. In the films viewed, some scenes show hard lighting and some scenes show soft lighting.

III.1.3. Sourcey/Ambient

The third quality of light noted in the films viewed is the origin of the light source in a scene. The light can either be sourcey or ambient. Sourcey defines a light whose origin can clearly be perceived in a scene [10]. For example, if the scene is framed in which a chandelier hanging above a dining room table illuminates a family having a meal, it is considered sourcey. The light that falls onto the people and objects in the scene is emanating from the chandelier.

On the other hand, ambient light defines a light whose origin cannot be determined in a scene. "Highly diffuse light that covers all of the set" is considered ambient light [10]. In addition soft lighting tends to be more ambient than sourcey. Since it scatters across surfaces of objects, it is directionless light [10]. For example, if the scene appears illuminated even though the location of the light is undisclosed, it is deemed ambient. There are different reasons directors and cinematographers would opt for a sourcey scene over an ambient scene, and vice versa. A sourcey scene can create the harshness desired in more dramatic scenes. An ambient scene can create calmness desired in more mellow scenes.

III.2. Color

According to the author of *Digital Lighting and Rendering*, Jeremy Birn, color can also be referred to as a quality of light [8]. Lighting in a scene can evoke different moods depending on the color of light. For example, a scene that is predominantly blue in tone can make the viewer perceive the scene as cold. The color of light can also indicate its direction. For example, if a scene shows a person standing inside an ancient pyramid and suddenly yellowish-white color light comes pouring through, the viewer can infer that a door had opened and daylight is entering the pyramid.

To better understand color of light, the properties of color will be discussed. Color has four basic properties: hue, value, chroma and temperature. The latter is a psychological aspect of color while the first three are referred to as the dimensions of color, its physical properties. Hue is defined as the name and the location of a color on the color spectrum. The lightness or darkness of a color defines the value of a color. If white is added to a color, it becomes lighter and is referred to as tint. If black or the complement of the color is added to that color, it becomes darker

and is referred to as shade [9]. Chroma is defined as the saturation of a color. If neither black nor white is added to a color, the color is highly saturated and appears pure and rich [8]. Temperature is defined as the "relative warmth or coolness of a hue." [9] Since temperature is tied to psychological aspects, studies have been done to prove that people are affected by the color of their surroundings. For example, in one study, it took longer for people to feel warm if they came in from the cold into a room painted in cool colors. On the other hand, those who came into a room painted in warm colors felt warm faster [9]. Therefore, colors can affect the mood of a scene.

III.3. Visual Characteristics of Animé Lighting: Traditional vs. Non-traditional

Lighting in animé has evolved over the years from bland to stylized. In the past the lighting appeared flat even with three-toned shading: midtone, shadow, and highlight. Although the shading revealed the direction of light, the light did not appear to wrap around the characters and objects. In order to add more three-dimensionality with lighting, color was added to lights and CG effects were used. Color and CG effects, along with a wider range of color tones in shading, contribute to the updated look of animé lighting.

To illustrate, one of the earliest animé TV series created by Tezuka Osamu, *Astro Boy* (1963) [33], showed lighting that was flat (see Figure 1, Figure 2, Figure 3, and Figure 4).

In the scenes above, brighter shades of color indicate where light is coming from. Since they do not use a range of more than three colors, the scenes appear flat. In addition, the color of the light looks consistent throughout a scene, thus the depth of the scene does not vary. The lighting lacks the ability to convey the mood of each

Fig. 1. Still example 1 from *Astro Boy*.

Fig. 2. Still example 2 from *Astro Boy*.

Fig. 3. Still example 3 from *Astro Boy*.

Fig. 4. Still example 4 from *Astro Boy*.

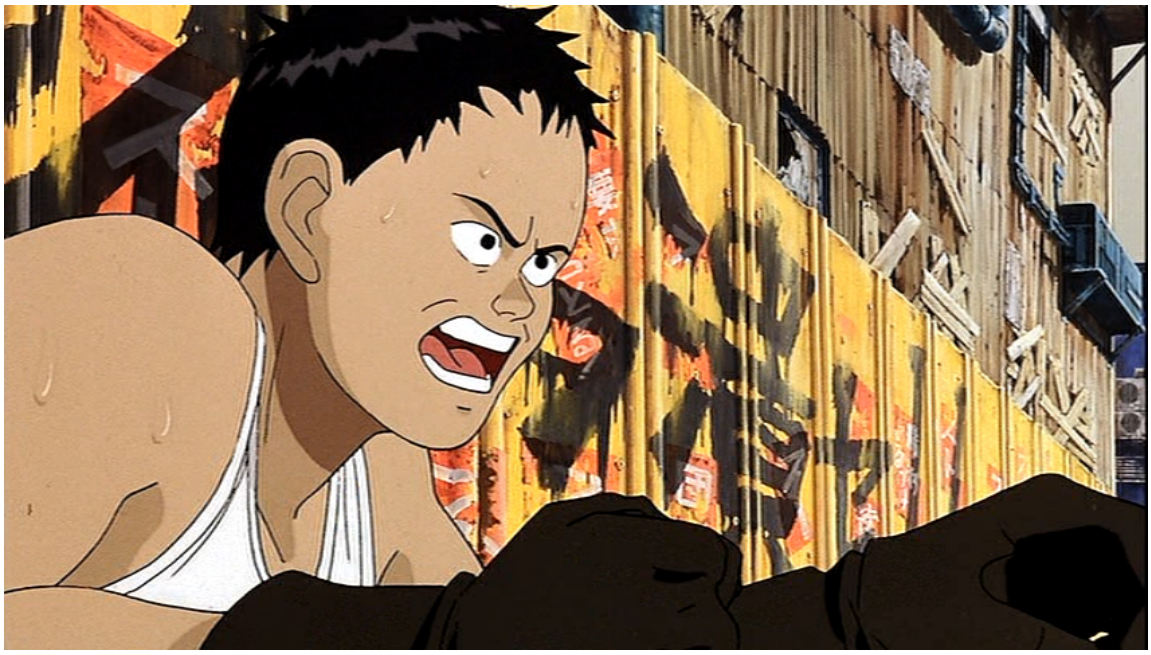

Fig. 5. Still example 1 from *Akira*.

scene. Only the expressions on the characters' faces indicate the current mood.

An improvement of lighting in animé, surfaces in Katsuhiro Otomo's feature film, *Akira* (1988) [1]. Yet, scenes still appears mostly flat (see Figure 5, Figure 6, Figure 7, and Figure 8 [7]).

The colors remain three-colored tones. However, the lighting appears to have more direction. Colors of lights are no longer just white. In Figure 6, orange lights were used for the buildings in the background, while blue lights were used for the foreground buildings. This created a contrast between the buildings.

Figure 7 shows yellow sparks emanating from the wheels of a motorcycle that indicates the tires are hotter than the blue lights of the opposite motorcycle's headlights. The light background against the darker foreground creates a sense of shallow depth in the scene.

In Figure 8, the character is surrounded by darkness aside from the bright blue

Fig. 6. Still example 2 from *Akira*.

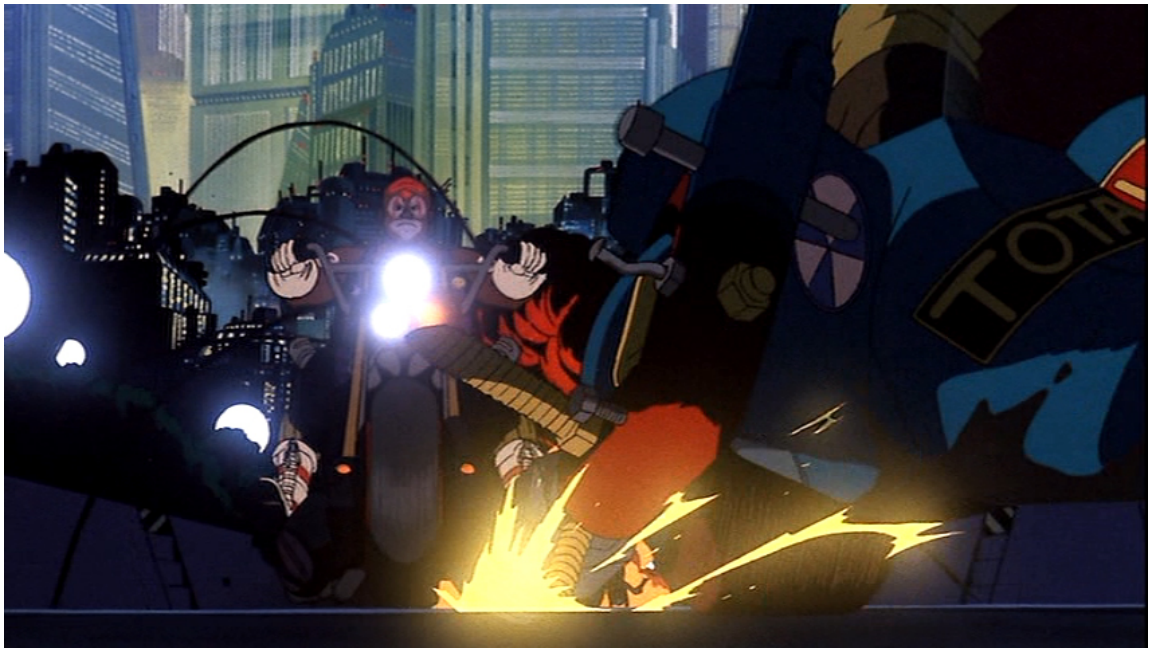

Fig. 7. Still example 3 from *Akira*.

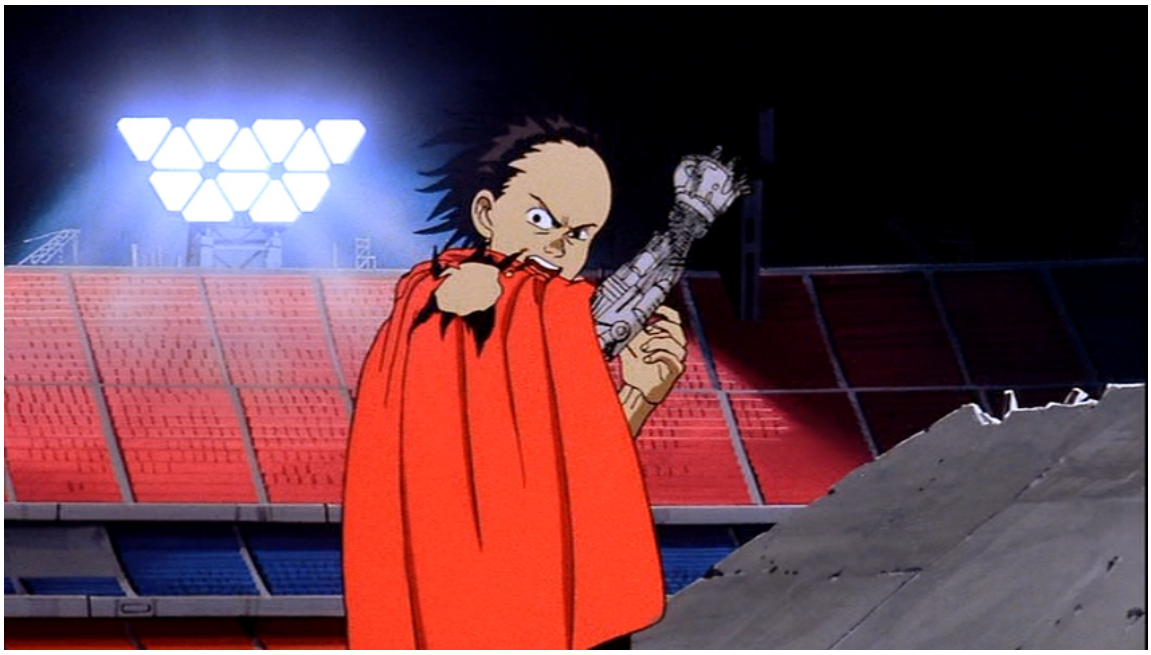

Fig. 8. Still example 4 from *Akira*.

lamp that appears to emanate from behind him. The scene is intense because the brightness of the lamp overpowers the character as he expresses anger toward something.

As animé ventures from traditional to non-traditional, lighting plays a more prominent role in animé and the creation of cinematic animé begins to grow. Using CG, creators were able to produce animé that possess more depth than the animé that came before it. For example, in 1995, Mamoru Oshii directed an animé based on Masumune Shirow's manga, *Ghost in the Shell* (1995) [6], that incorporated the use of 2D animation with CG effects such as lighting and explosions [16].

The result was an animé film that felt "more like a live-action movie." [14] (see Figure 9, Figure 10, Figure 11, and Figure 12).

The bright red flames in the scene of Figure 9 appear hot and intense as the character is flying out from it. The light from the fire illuminates the character's face

Fig. 9. Still example 1 from *Ghost in the Shell*.

Fig. 10. Still example 2 from *Ghost in the Shell*.

Fig. 11. Still example 3 from *Ghost in the Shell*.

Fig. 12. Still example 4 from *Ghost in the Shell*.

and clothes. The scene no longer feels flat as more color tones are used. The fire makes use of at least six color tones. This helps create a sense of depth in the flames.

In Figure 10, the lighting in the scene comes across as moody and solemn as the character is pondering while sitting atop a roof. There are certain highlights on the character that indicate that the source of light comes from below. The lighting in the background buildings is lighter in contrast with the structure in the middle ground, a dark roof.

In Figure 11, the scene is reminiscent of cop movies where the police officer is interrogating the suspect using one lamp as intimidation. The light from the lamp illuminates all three characters in the scene, focusing mainly on the character in the center. The character in the foreground catches some of the light on his clothes, while the character on the left catches more light since he is standing closer to the lamp. The scene is both mysterious and dramatic.

In Figure 12, the scene is simple with mannequins standing in which half the walls are made of glass. The light above them is so bright that it illuminates the signs outside and the boat below. The purplish-blue tone of the other buildings creates contrast with the brightly lit yellow room. The room appears alive and warm compared to the city outside. Ironically, the mannequins have no life within them. The pitch black in parts of the scene creates a sense of eeriness as the viewer does not know if anything lurks from within.

Incorporating CG into animé was successful enough that it inspired more creations, not limited to using CG for lighting and explosions. In Makoto Shinkai's animé feature film, *The Place Promised in Our Early Days* (2004) [12], he incorporates the use of CG models while retaining the 2D look of animé. The lighting in his animé comes across beautifully nevertheless (see Figure 13, and Figure 14).

In Figure 13, the scene shows light pouring through the windows to convey that

Fig. 13. Still example 1 from *The Place Promised in Our Early Days*.

the time of day is early morning. The haziness of the beams of light indicates the room is getting warmer as more sunlight descends into the room. In addition, the light creates a glow around the character that is standing in the room. The set of lights hanging from the ceiling are 3D models composited into the scene. The scene in Figure 14 shows beams of light in contrasting colors of blue and orange. The lighting evokes a feeling of a nice sunny day at the park. The green tones in the background imply there are trees or bushes that the sun also shines through. In addition, the scene appears to have a dimensionality not found in traditional animé. There is depth created between the foreground and background. The vehicle on the left is a 3D model that is made to appear 2D.

As techniques of animé creation advance, so does the look of animé. Following is a look at an animé film created completely with CG. The flat-shading and the

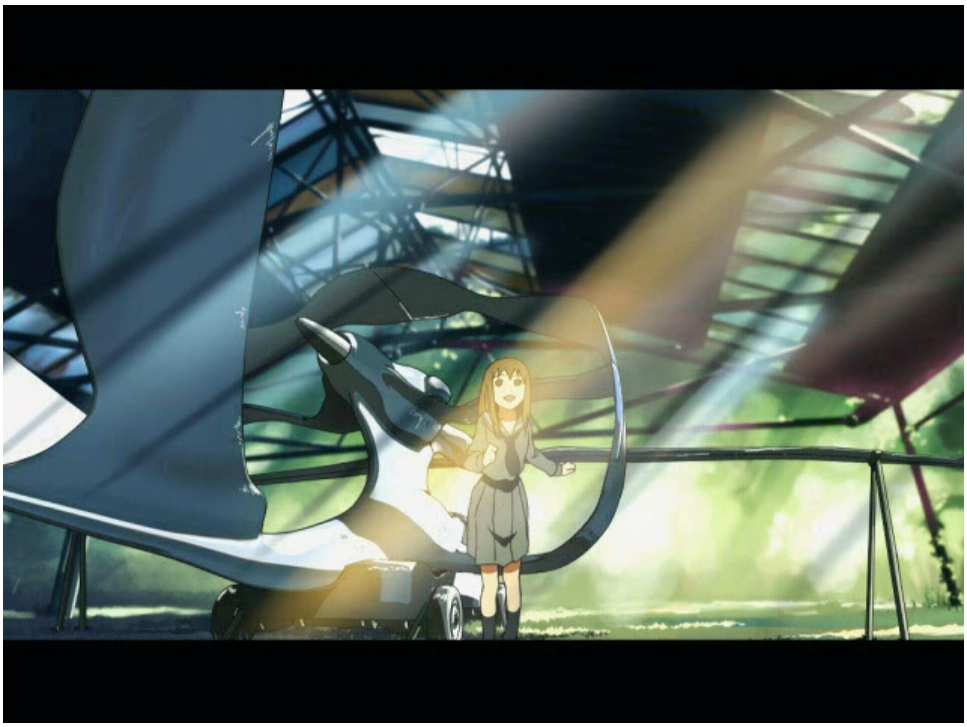

Fig. 14. Still example 2 from *The Place Promised in Our Early Days*.

outlines of the characters are nonexistent. This film is as non-traditional as *Astro Boy* is traditional. The lighting makes the scenes appear photorealistic in the following scenes from *Final Fantasy VII Advent Children* (2005) [31] (see Figure 15, Figure 16, and Figure 17).

The scene in Figure 15 is reminiscent of scenes in *Citizen Kane*, where beams of light are descending from above. The character appears to be experiencing enlightenment as the stain glass windows indicate he is in a church. Since the foreground is dimly lit, it creates contrast with the middle ground. It suggests the character may be in conflict between good and evil.

In Figure 16, the scene shows the use of lighting from dark to light to create depth in the scene. The objects in the foreground are silhouetted while in the background, the objects are very bright. The intensity and the position of the light source imply

Fig. 15. Still example 1 from *Final Fantasy VII Advent Children*.

Fig. 16. Still example 2 from *Final Fantasy VII Advent Children*.

Fig. 17. Still example 3 from *Final Fantasy VII Advent Children*.

that the time of day is around noon.

The scene in Figure 17 shows a closeup of a character with light from window blinds casting onto his face. The scene is reminiscent of a scene in *The Conformist* where alternating slits of light and shade are casting onto the character as well. However, in this scene, since the shade is falling onto the character's eyes, it indicates he may be dishonest. The hair falling in front of the other eye completely hides what he is thinking, a similar idea found in *The Godfather*. The light behind the character is soft and colored yellow and orange, thus the time of day most likely falls into the early evening.

As evident in the examples above, lighting in animé has evolved from a simple animation to a full-fledge cinematic film. As animé continues to change in the future, the combination of simple animation with cinematic qualities will become the new standard for animé.

CHAPTER IV

METHODOLOGY

IV.1. Analysis of Cinematography Styles

This section will discuss scenes from films in which quality or qualities of light are more distinguished. In addition, color, also as a quality of light, will be discussed in each film's section if applicable.

IV.1.1. Citizen Kane

IV.1.1.1. Lighting

In *Citizen Kane*, cinematographer Gregg Toland creates mystery in the theater room scene (see Figure 18).

At first glance, light can be seen streaming through two small square windows. Only two main characters' silhouettes can be seen because of the strong rim of light falling on their heads and shoulders. The backlights create a defining edge to separate the subjects from the background [8]. However, faint silhouettes of other characters can also be seen. The right side of the scene is almost in complete darkness. Since there is no visible light source inside the room, the light coming from outside becomes the main source of light in the scene. The light is flowing through a thick cloud of cigarette or a cigar smoke. The high contrast between bright areas and shadow areas of the scene creates a feeling of suspense in this low-key scene.

Similar beams of light can also be found in another scene from *Citizen Kane*. While the following scene also possesses a dimly lit foreground, a different kind of drama is created. The scene portrays a character moving towards the light, perhaps

Fig. 18. Still example 1 from *Citizen Kane*.

Fig. 19. Still example 2 from *Citizen Kane*.

in hopes of expanding his knowledge.

In a scene from *Citizen Kane*, beams of light are seen descending from above (see Figure 19).

They are soft and heavenly as they light the table below. The guard in the center is holding a book that almost glows, and the three people in the scene are dimly lit in comparison. The light falls softly along the head and upper body of the woman on the right, while the light partially illuminates the guard. The dark lines on the surface of the table come from the shadow of a window frame. According to the Blain Brown, in *Cinematography Theory and Practice: Image Making for Cinematographers, Directors, and Videographers*, his perception of the scene concludes

Fig. 20. Still example 3 from *Citizen Kane*.

that the beams of light "represents knowledge reaching into the darkened space." [9] In addition, the characters being lit with a backlight without any fill light represents their ignorance of the knowledge [9]. The origin of the beams of light is not visible, in order to imply that knowledge comes from everywhere. Not grasping it when it is available can prove to be a disadvantage.

While the character in *The Godfather* appears underlit in the scene (see the figure on page 32), he looks nowhere near as dominating and intimidating as the character in the following scene from *Citizen Kane*. A powerful backlight was used to illuminate the characters (see Figure 20).

Two windows show extremely bright light pouring in from outside. One of the

windows is obscured by the man standing before it. Since it is darker inside the room than outside, the light source appears more intense as it comes in through the two small windows. A hard-edge backlight wraps around the man on the right and a soft-edge backlight wraps around the man on the left. This suggests that the man on the right is the dominant character in the scene. The light creates the impression that the man on the right is overpowering as the light wraps around his head and his business attire. The shadows on the wall are created by the beams of light coming through the windows. They appear sharp at first but become soft the farther away its distance is from the window. Even though the scene does not have hard highlights and the distance of the source of light is close, soft lighting appears to dominate as the light spreads itself around the room.

IV.1.2. The Godfather

IV.1.2.1. Lighting

Not all scenes with light coming in through the windows show mystery and suspense. In the following scene, the patterns of soft light evoke calmness and patience that the previous two scenes do not.

In *The Godfather III*, soft natural light pours in through the window (see Figure 21).

The entire Godfather series is predominantly lit with soft light. From the window on the right, slits of shadow and light fall onto the wall immediately next to it. The light coming from the window on the left helps to illuminate the left side of the room. The shadows falling onto the desk beneath the window projects a sense of calmness even thought the papers on the desk are in disarray. As the light passes through the curtain, the light becomes less harsh as it is scattered by the cloth. Light passing

Fig. 21. Still example 1 from *The Godfather III*.

through the blinds is broken up as alternating slits of wood block the light's path. The highlight on the chair is soft and spread out along the rim. Similarly the highlight on the right side of the character's face is also soft and distributed along his face. The mood is peaceful, yet the sternness of the character's expression leads the viewer to believe that troubles lie ahead.

In another scene from *The Godfather* series, the character also holds a stern face, yet the same serenity is not evident.

In *The Godfather II*, cinematographer Gordon Willis creates a somber scene with minimal lights (see Figure 22).

In this scene, there are four barely visible characters. Aside from the white cuffs of their shirts and their faces and hands, they are difficult to distinguish in the darkly lit room. There is no visible light source in the scene. Yet, light falling on the hair of the characters indicates that there is a light source positioned high above them. That same light also reveals a woman wearing a dress, standing in front of the man seated

Fig. 22. Still example 1 from *The Godfather II*.

in the armchair. Near the right side of the image stands a lamp that appears to serve no purpose in lighting the scene. Areas in the foreground and background remain completely black. The darkness of this scene, obscuring foreground and background is a classic example of an underlit scene. The lack of fill lights conveys the somber mood. This mood is further illustrated by the children huddled into one arm chair when there is an empty one right beside it.

As the eyes of characters in the previous scene are hidden, the eyes of the character in the following scene also remain in shadow.

In *The Godfather*, ambient light creates mystery in the facial expression of the subjects (see Figure 23 and Figure 24).

In Figure 23, only small amounts of light are entering through the slits of the window blinds. However, the man on the left, one of the main characters of the story, is barely being illuminated by that light. A lamp in the room, not seen, seems to

Fig. 23. Still example 1 from *The Godfather*.

Fig. 24. Still example 2 from *The Godfather*.

illuminate the left side of the room since the man's back appears darker. There also appears to be a light source emanating from above that result in the dark shadows on the eyes. This creates uneasiness and suspense. Cinematographer Gordon Willis states, "you saw a mysterious human being thinking about something or about to do something but you didn't really know what the hell was going on." [3] Willis believed it was "more appropriate not to see their eyes because of what was going on in their heads at certain moments." [32] This technique was accomplished by soft, overhead lighting. Light emanating from above is difficult to determine, causing the viewer, like characters in the scene, to be kept in suspense, not knowing what will happen next.

IV.1.2.2. Color

In scenes from *The Godfather* and *The Godfather II*, a yellow tone was used throughout the two films to convey that the stories took place in the past (see Figure 25, Figure 26, Figure 27, Figure 28, and Figure 29).

Gordon Willis, the cinematographer of *The Godfather* films, wanted to keep yellow tones throughout all three films in order to maintain unity between each film. The films possess a golden amber tone. Willis used the term yellow when he refers to golden amber because when the films go to print, the laboratories add yellow to the films during the printing process [32]. A golden amber tone conveys a period style of the 1940s. It is also reminiscent of old photographs.

The scene in Figure 25 portrays a sense of strong family ties and warmth between family members. Furthermore, the yellowish tone of the scene gives the viewer a sense of nostalgia. The subject of the scene, a family being photographed, expresses a historical time in the family's history.

In Figure 26, the colors are very saturated. The black of the train is rich. The

Fig. 25. Still example 3 from *The Godfather*.

Fig. 26. Still example 2 from *The Godfather II*.

Fig. 27. Still example 3 from *The Godfather II*.

Fig. 28. Still example 4 from *The Godfather II*.

Fig. 29. Still example 5 from *The Godfather II*.

red on the front of the train is vibrant. The golden amber tone is predominant on the left side of the scene. The costumes of the actors further conveys the time period of the scene. The scene in Figure 27 reveals a family having a meal outdoors against the backdrop of an old building in Sicily. The golden amber tone can be perceived to express a sense of family togetherness, as they enjoy each other's company on a beautiful day. The scene looks like an old photograph or an old postcard.

In the scenes of Figure 28 and Figure 29, the viewer can assume that the main source of light originates from the sun. The golden amber tone in Figure 28 gives the impression that the two men in the scene are not strangers, but that they have known each other for more than just a day. Figure 29 portrays the 1940s in New York, which is further supported by the color and the subjects in the scene [32].

Fig. 30. Still example 1 from *Days of Heaven*.

IV.1.3. Days of Heaven

IV.1.3.1. Lighting

Unlike the complex scenes seen later in *Prospero's Books*, a simplistic scene can also show the depth perceived from a contrasting foreground and background.

In *Days of Heaven*, the lamp in the center is the main source of light (see Figure 30).

A gazebo is beautifully lit after sunset by the light within. The light appears diffused through the soft fabric of the draperies. A warm glow is felt radiating from the gazebo against the dark background of the reddish-purple colored sky and the horizon line. Silhouettes of people can be seen through the draperies. Their profiles can be seen, revealed by this sourcey light. The intensity of the light creates a sense

Fig. 31. Still example 2 from *Days of Heaven*.

of warmth and togetherness among the people within the gazebo.

While the light feels trapped into a small area in the previous scene, a similar glow of warm light can be found through natural light in a more open space. In the following scene, tranquility fills the air and seeps into the characters as the day nears its end.

In *Days of Heaven*, the magic hour of after sunset gives off a warm glow (see Figure 31).

The light given off by the sun during "magic hour" has a very soft glow about it. The term "magic hour" was used by the cinematographer of this film, Nestor Alemendros, to describe the period of time immediately after sunset before the night falls. He explained that the "sky has light, but no sun. The light is very soft. It gave a magic look, the beauty; a romanticism that color could do much better than black

Fig. 32. Still example 3 from *Days of Heaven*.

and white." [3] Since the sun is not directly located above, the light given off is not as intense as it would be during the day. Thus, in the scene above, the light appears to lightly wrap itself around the subjects, barely illuminating them. The foreground subjects are darker than the background which allows the viewer to feel a sense of depth in the scene.

Almendros not only uses the "magic hour" to evoke serenity in a scene, but he also uses it to evoke drama.

In *Days of Heaven*, Almendros creates a beautiful scene that shows light neither in an open space nor within a confined space (see Figure 32).

The scene above shows a silhouette of a character running away from the camera against angelic rays of light shot through with smoke. In the foreground, the columns on both sides of the image are dimly lit to create contrast with the background. The

Fig. 33. Still example 4 from *Days of Heaven*.

areas where the shadows fall are dark, and are even black in certain parts. The light emanating from the sun shining through the cracks of the building appears to be the only source of light in the scene. The angle at which the light shines into the place indicates that the time of day is early morning, right after sunrise, or early evening, right after sunset. There is very little fill light at the base of the columns. The contrast between foreground and background heightens a sense of frantic escape as the character runs away into the depth of the scene.

IV.1.3.2. Color

Color can also play an important role in a film. While colors in *The Godfather* series conveys a time in history, the colors in *Days of Heaven* tells of the time of day (see Figure 33).

Most of the scenes were shot during the time immediately before dawn or the time immediately after sunset "magic hour." The red and orange tones evoke the mood of a relaxing evening. Together the colors create the impression of a warm and intimate environment of a small farm after a long day of work.

In order to capture these colors and the lighting of "magic hour," the shooting schedule of the film was arranged for late evenings [9]. This also gave the film a more saturated look [32]. Almost all of the scenes were shot with natural light. This is partly due to cinematographer Nestor Almendros's preference for realism. If a scene was shot outdoors, he would see how the light normally falls on subjects, and then reinforce it by adding more lights. For an indoor scene, additional lighting created a look of lamp light due to the time period of the film [32]. Thus color can create a soothing, nostalgic effect.

IV.1.4. The Conformist

IV.1.4.1. Lighting

Mystery is created in a scene from *The Conformist*. It also shows natural light pouring through two windows. However the windows are larger in this scene. Yet, the scene appears even darker than the scene in *Citizen Kane* (see Figure 18). Lighting in a scene that is nearly half in darkness comes across as being underlit and suspenseful.

In *The Conformist*, half the scene is in complete darkness (see Figure 34).

The sudden abruptness of light to dark results from the hard lighting of this scene. Shadows created by the light are sharp and crisp. The cinematographer, Vittorio Storaro, wanted to show a distinct separation between light and shadow [32]. When the light falls on the man on the left, it only partially illuminates him while leaving the rest of his body in complete darkness. Similarly, the room was lit in

Fig. 34. Still example 1 from *The Conformist*.

Fig. 35. Still example 2 from *The Conformist*.

parallel with the man. The viewer is able to see a desk with some items sitting on top of it, including a lamp and a statue. The rest of the room remains hidden in darkness. On the right side of the scene, there is another man standing against the window. The light on him is equally harsh. Although the man is wearing a distinguishable suit and glasses, his face is unrecognizable. The tension between the two characters is made apparent by the harsh contrast between light and dark.

The following scene from *The Conformist* does not show as much depth in the scene even though it is underlit and high in contrast. The artificial light source that illuminates the scene appears just as mysterious as the figure on the left (see Figure 35).

Uncertainty about what may emerge from the darkness creates an unsettling feeling. The figure on the left side of the screen, a young girl, is walking towards

Fig. 36. Still example 3 from *The Conformist*.

a woman. The woman is sitting in a pool of hard light that appears to be coming from the left side of the screen. Her face is half lit with an abrupt change from light to shadow, while her eyes remain in the dark. With the abundant darkness of the scene, and the light shining intensely upon the woman, the origin of the light remains hidden. The blue light from the window behind them creates contrast with the yellow tone from the light inside the room. Overall, the harshness of the scene makes it a powerful image with unseen mystery.

In the following scene from *The Conformist*, light also plays a role in establishing rhythm. Cinematographer Vittorio Storaro creates a bold scene with horizontal and diagonal patterns in the scene below (see Figure 36).

In this scene, a woman dressed in a dress of black and white diagonal patterns sits in an armchair. Behind her is a window with blinds that project a pattern similar

Fig. 37. Still example 4 from *The Conformist*.

to the dress. Since the light coming through the blinds is limited, there is little fill light to illuminate the room. The light does not seem to be able to reach the shadow areas. This creates a sense of darkness in the scene and it is difficult to determine what surrounds the woman. The pattern of light streaming through the blinds along with the pattern of black and white stripes on the woman's dress is reminiscent of a prisoner locked in a jail cell cage. Storaro wanted to show the woman caged by light, to evoke a sense of claustrophobia [32].

IV.1.4.2. Color

Color can create excitement in the scenes if contrasting colors are used. For example orange and blue created striking contrasts in *The Conformist* (see Figure 37, Figure 38, Figure 39, Figure 40, and Figure 41).

Fig. 38. Still example 5 from *The Conformist*.

Fig. 39. Still example 6 from *The Conformist*.

Fig. 40. Still example 7 from *The Conformist*.

Fig. 41. Still example 8 from *The Conformist*.

Orange and blue were the primary colors used in this film. The color contrast is more visible in the scenes because the colors are complementary. Vittorio Storaro, the cinematographer, experimented frequently with opposites: artificial light and natural light, day and night, warm and cold, shadows and light, and white and black. He used opposites to express conflict [32]. This film was set in a claustrophobic period and a time of dictatorship. "At that historical time the promises were very great but their fulfillment in reality was very little," [32] so he expressed the conflict between stated and actual reality by contrasting the color in an interior space with that of an exterior space. He gave the interior a warm tone by using orange, and the exterior a cool tone by using blue.

In Figure 37, the buildings and the street are all tinted with blue, while the lamps and the headlights of the car are orange. The overall mood of the scene is cold. The man appears to feel cold, made apparent by the black coat he is wearing.

The scene in Figure 38 shows the same concept as Figure 37. The structure is tinted blue while the lamps are tinted orange. In addition, the scene presents windows on the side of a building that are also tinted orange. The viewer perceives the interior of the building as warmer than the exterior. It causes the viewer to feel that on the other side of those windows is cozy place filled with warmth.

Figure 39 is different because the entire scene is tinted blue to indicate a cold winter night. The deserted look of the street indicates the building may be abandoned.

Figure 40 is a scene of two people with blue tinted faces. This time blue represents "the danger of succumbing to temptation." [9] The couple looks somber as it appears they are trying to devise a plan to escape from someone or something. The backlight falling onto the woman's shoulder and the man's face can infer that the couple is not completely helpless, as the light symbolizes a way out.

Figure 41 portrays a couple separated by a wall. The contrasting colors can

imply the personality of each person. For example, the man is being illuminated blue because he is a cold-hearted person. The woman is being illuminated yellowish-orange because she is a warm-hearted person. The complementary colors imply that even though the couple has opposite personalities, they remain attracted to each other. However, the mood of the scene suggests that a rift has formed between the couple, as a wall is standing between them.

IV.1.5. The Last Emperor

IV.1.5.1. Lighting

While light appears to create tension and bring out one character over another in the scene from *Citizen Kane* (see Figure 20), light can also be used to physically separate characters in a scene.

In *The Last Emperor*, tension stirs among the subjects in the scene below (see Figure 42).

A sense of coldness can be felt from this scene as the viewer sees three men standing amidst a room like soldiers awaiting the command of a superior officer. The man sitting in the far room, the emperor, looks out towards the men. The manner in which he is sitting on the throne convinces the viewer that he is not appeased by his subjects. The stance of the three men conveys feelings of shame as their heads remain bowed even though the emperor has left the room. The lighting in the scene helps to reflect the tension between the three men and the emperor. The light spills into the room through the windows, casting sharp shadows on the ground. The light falling on the three men is also abrupt. The light scatters very little on their clothing and their skin, thus the specularity remains sharp. The way the light appears to separate the three subjects and the emperor suggests a rift has opened between

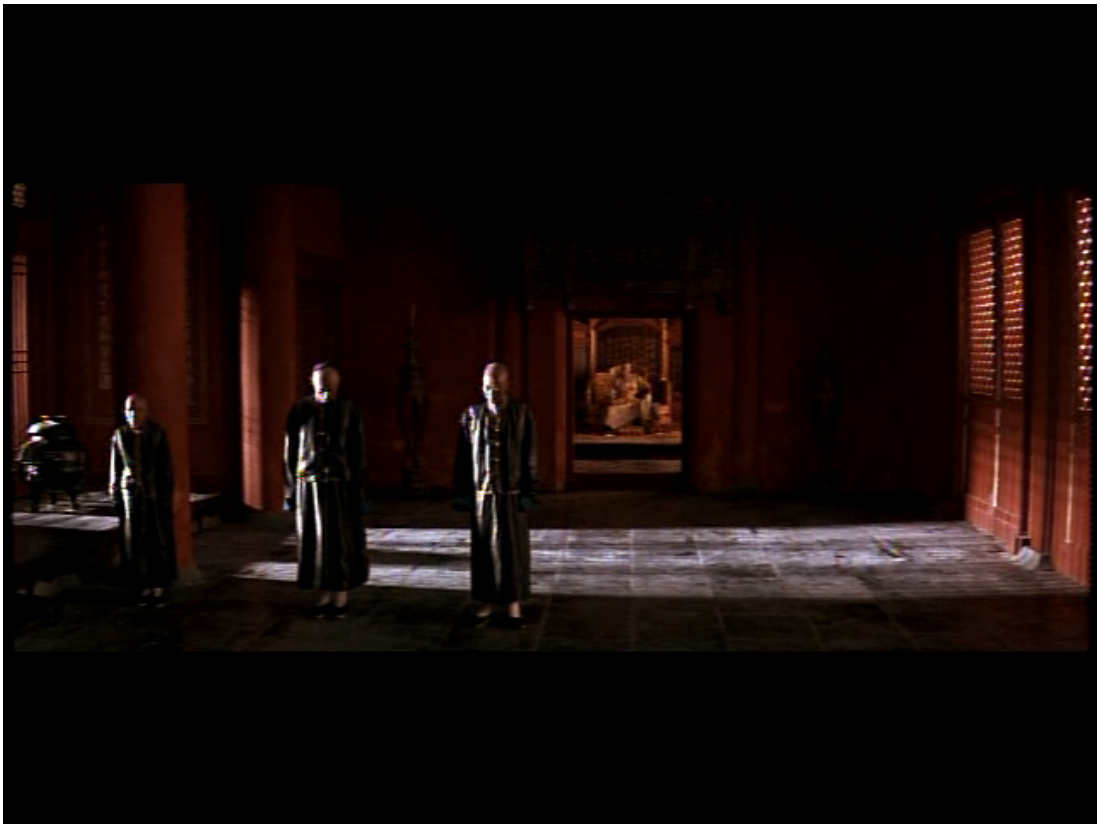

Fig. 42. Still example 1 from *The Last Emperor*.

Fig. 43. Still example 2 from *The Last Emperor*.

them. Additionally, the contrast between light and dark helps to reveal the depth of the scene.

As in the scene from *The Conformist* (see Figure 36), light patterns are similarly found in a scene from *The Last Emperor*. This time the patterns are squares instead of slits. Nevertheless, it still gives the impression of being caged. If a character feels trapped, the atmosphere is certainly not a pleasant one.

The moonlight creates a solemn atmosphere in the scene below (see Figure 43).

Blue light shines in through the window, making moonlight the dominant light source in the scene. The lamp on the ceiling is weak at best and the character remains completely silhouetted by the moonlight behind her. The high saturation

Fig. 44. Still example 3 from *The Last Emperor*.

of the visible moonlight and the pale tone of the nearest walls create a nice contrast that further intensifies the somber mood of the woman.

IV.1.5.2. Color

Not only can color be used to convey a period in time, or the time of day, color can also be used to tell a story about the different stages of life.

In *The Last Emperor*, the predominant color in each scene marks a different stage of the emperor's life (see Figure 44, Figure 45, Figure 46, Figure 47, Figure 48, and Figure 49).

The cinematographer who worked on *The Conformist*, also worked on *The Last*

Fig. 45. Still example 4 from *The Last Emperor*.

Fig. 46. Still example 5 from *The Last Emperor*.

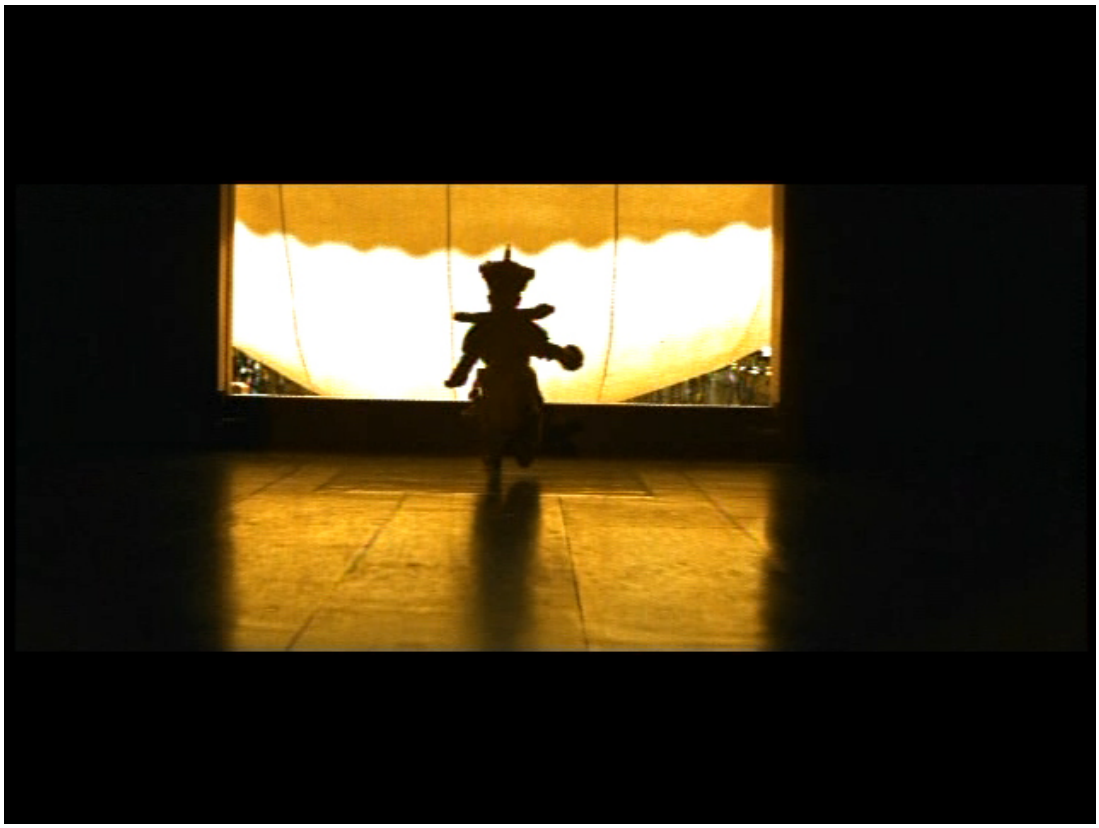

Fig. 47. Still example 6 from *The Last Emperor*.

Fig. 48. Still example 7 from *The Last Emperor*.

Fig. 49. Still example 8 from *The Last Emperor*.

Emperor. Vittorio Storaro had the idea to make an analogy between life and light. He mentions that the emperor's journey of life could be represented as different stages with colors [9]. Instead of using complementary colors in this film, he used a monotone color scheme.

In Figure 44, only the hands of the emperor are seen dipped into water, while blood is gushing out from underneath them. This is the first time red is used in the film. It represents the beginning of the emperor's retelling of the story of his life. Cutting his own vein and seeing the blood flow out, he not only tried to commit suicide but also is remembering he was born an emperor [9]. This scene transports him back to the beginning of his life when he is taken from his mother to become the last emperor of China.

Figure 45 shows the young emperor being embraced by his mother. The orange tones used in the scene signify warmth and maternal embrace. The lights placed around the queen emanate the orange tones of color that elicit the feeling of family [9].

Orange also represents the color of the Forbidden City [9]. The scene in Figure 46 takes place in a great hall adorned with columns with dragons wrapped around the top. The color of the light pouring through between the columns is orange. The beams of light are more apparent due to the smokiness of the hall. The orange tone also allows the viewer to perceive that the time of day is in the late afternoon, when the sun is still out but is at a lower position in the sky.

The yellow in Figure 47 represents the color of identity, "when we become conscious." [9] Yellow also symbolizes the sun and is the color of the emperor. Hence, the emperor's main garment of clothing is yellow. In the scene, the young emperor is running out towards the yellow cloth, symbolizing that he is embracing his identity as the new emperor.

Green is the color of knowledge [9]. The color of the automobile is painted green in Figure 48. It is the first time green is used in any of the scenes taking place within the Forbidden City. Since green represents knowledge, and knowledge is gained from others, green was used in this scene to show that the new tutor is arriving. The tutor is seen near the left side of the screen wearing the black top hat. Up until that moment, the emperor "did not know anything about one section of [the] color spectrum: green, blue, violet, indigo; only reds, oranges, [and] yellows." [9] The people in the emperor's court decided that the emperor should not know everything, "he should only know a portion of it because knowledge can hurt him." [9] That was their naive way of thinking before the emperor enlisted a new tutor from outside the Forbidden City.

In Figure 49, the scene is slightly different than the previous examples. The colors used in this scene show contrast and indicates the time of day. Two colors were used in this scene: orange and blue. This is reminiscent of the color scheme Storaro used in *The Conformist*. Blue represents the moonlight outside of the windows, while the orange creates contrast, warmth, and light inside the dark lit room. Thus, since the lamp is turned on, and it is blue outside, night time is implied.

IV.1.6. Prospero's Books

IV.1.6.1. Lighting

The lighting in the scene from *The Godfather II* (see Figure 22) appears to illuminate certain areas without a visible light source. The following scene shows a more noticeable light source.

In *Prospero's Books*, a flame ignites fire into the scene (see Figure 50).

The source of light in the foreground is obviously the flame. It illuminates three

Fig. 50. Still example 1 from *Prospero's Books*.

naked subjects on the left, giving them a soft, warm glow. It also lights up the dancer in the center. Not only does the flame light up the people in the scene, it illuminates the objects on the table and the columns behind them. The light on the columns shows a gradual transition from light to shadow. Even though the foreground is illuminated by the flame, the light illuminating the background remains undisclosed. As with later scenes from the film, the viewer may feel overwhelmed by the populated scene, but the contrast between the foreground and background suggests unseen depth.

As in a scene from *Blue Velvet* (see Figure 55), which appears well illuminated and populated with people and objects, the following scene does not. Yet, there appears to be something hidden and unsettling just as the character's faces in Figure 55 seems to be hiding something.

In *Prospero's Books*, cinematographer Sacha Vierny adds great depth to the scene through a lack of illumination (see Figure 51).

The color between the columns is pitch black. The foreground shows silhouettes of columns and unknown objects on the floor. The middle ground shows a pool of light which appears to be emanating from the ground rather than the ceiling. The person standing on the far side of the pool emerges from the barely illuminated background. The lighting scheme of a dark foreground, light middle ground, and dark background allows the viewer to perceive the vast depth of the scene. The darkness creates space that may be either empty or occupied. This is unsettling, making the viewer unsure whether something is hidden behind the columns. The stark contrast between the foreground, middle ground, and background creates a sense of drama reminiscent of a grave stage play.

The scene in *The Last Emperor* (see Figure 42) shows three subjects with a distinct separation between them. By contrast, in the following scene from *Prospero's Books*, there seems to be no separation between the characters. The sharp lines and

Fig. 51. Still example 2 from *Prospero's Books*.

Fig. 52. Still example 3 from *Prospero's Books*.

high contrasts contribute to the depth of the scene (see Figure 52). There appears to be a rhythm as the light alternates from light to dark and vice versa. It keeps things moving even into the background.

Many people and objects populate the scene as carefully placed lights illuminate each one to bring about awareness of each. The alternating dark and light illumination keeps the viewer's eye moving into the depths of the scene. Darkness on screen left and lightness on screen right emphasizes camera motion from left to right. The sharp shadows on the floor, along with the shadows on the columns and the ceilings, reveal hard lighting. Specularity is sharp as evident on the rim of the vase near the lower left of the screen. In addition, along the sides and the upper part of the columns, the specularity creates striking contrast even in the background part of the scene. The mood of the scene appears chaotic as there are many things happening at one time.

Fig. 53. Still example 1 from *Blue Velvet*.

The viewer experiences a sense of anxiety by all the action.

IV.1.7. Blue Velvet

IV.1.7.1. Lighting

A focused and untraceable light can be found in *Blue Velvet* similar to the scene from *Citizen Kane* (see Figure 19). The following scene shows an exterior shot seemingly lit with one spotlight.

In *Blue Velvet*, cinematographer David Lynch creates a voyeuristic feel to a few of the night scenes, specifically when it is a shot of the exterior of a building (see Figure 53 and Figure 54).

Many scenes from *Blue Velvet* are very creepy and mysterious. In particular, the scenes above give the viewer a feeling of voyeurism. The viewer seems to be looking at the building through binoculars due to dark vignetting around the frame of the

Fig. 54. Still example 2 from *Blue Velvet*.

image. This is a creative way to foreshadow an unfortunate event. The lack of lights inside most of the windows indicates the building may be largely deserted. Aside from the street lamps, traffic lights, and building entrance lamps, there appears to be one main source of light in each image. In Figure 53, that main source of light appears to come from the lights of a building that is on the opposite side of the street. In Figure 54, the main source of light appears to come from the headlights of a car from far away. Thus, the darkness produced by the sudden falloff of light into the corners and borders of the image and the lack of fill lights heightens a sense of impending doom.

The same sense of eeriness is also evident in an indoor scene from *Blue Velvet*. The scene does not appear as deserted, yet the vignetting around the frame of the image along with the stern expressions on the characters' faces evokes similar uneasiness as in the previous two scenes.

Hostility appears to exude from the people within the scene of *Blue Velvet* (see

Fig. 55. Still example 3 from *Blue Velvet*.

Figure 55).

Apparently the people sitting in the room are unhappy or they are guarding the room behind them. The light emanating from the lamps produces well-defined crisp shadows resulting in sharp contrasts. Although the specularity is subtle, it remains visible on the leather-clad sofa. The horizontal pattern on the rug along with the vertical lines of the door frames, tables and chairs bears a feeling of stiffness amongst the people and the objects in the room. The simple shapes of the lamp shades are easily distinguishable due to the high contrast between the light emitting from the lamps and the darkness of the lamp shades. If the cinematographer had used soft lighting techniques in this scene, the ability of the scene to convey stoicism and hostility may be less effective.

Fig. 56. Still example 4 from *Blue Velvet*.

IV.1.7.2. Color

While colors can represent time, colors can also be used to show feelings about a place.

In *Blue Velvet*, primary colors were used in the beginning scenes of the film, while specific latter scenes exhibit only blues and reds (see Figure 56, Figure 57, Figure 58, and Figure 59).

In beginning scenes of *Blue Velvet*, the colors used in the scenes were bright and saturated. However, for the rest of the film, colors take on a less saturated look. Aside from the piano bar scenes, with the bright reds and blues, the rest of the film is fairly dark. In Figure 56 and Figure 57, pure shades of red, blue, yellow, green, and white are used to represent a feeling of an ideal town. The colors imply that the town in which the characters lived is cheerful, bright, and nothing can possibly go wrong. Yet, in previous examples of scenes from this film, color was kept to a bare

Fig. 57. Still example 5 from *Blue Velvet*.

Fig. 58. Still example 6 from *Blue Velvet*.

Fig. 59. Still example 7 from *Blue Velvet*.

minimum. Here color is used to convey irony, implying that everything is a little too "normal." In contrast, colors in latter parts of the film were dull and minimal.

One exception to this color styling occurs in scenes in a piano bar in which saturated reds and blues are used. The cinematographer chose these colors to define the character of the woman. Figure 58 and Figure 59 shows the woman on stage against a red backdrop and illuminated with blue neon lights. Red represents one side of her personality which is warm and intimate, while blue represents the other side of her which is cold and heartless. The two color tones create beautiful contrast, as each color can clearly be perceived in the scene.

Thus, depending on the intent of the cinematographer, color was used in different ways to represent a variety of things. A successful color scheme and techniques of using color can support a film in many ways.

CHAPTER V

IMPLEMENTATION AND RESULTS

The models for the scenes were created using 3D software. The textures for the models were painted using 2D paint software, and then applied to the 3D models. Finally, the lights were created using 3D software. The tools to create the three CG scenes are *Alias/Wavefront MAYA*™ for modeling, animation, and rendering, and *Adobe Photoshop*™ for painting textures.

This section shows images of the character model and images of the three CG scenes. The three scenes make up one continuous animation sequence.

The three CG scenes show the qualities of cinematic lighting while retaining the look of animé. To help animé evolve, cinematic lighting style was adapted to the animé style scenes. The analysis of the selected films and animé contributed to the decisions made during the process of creating the visual CG piece.

V.1. Model of the Animé Character

The character model is a young girl wearing a dress, gloves, stockings, and shoes. She possesses big eyes, a thin body, and plump-looking boots (see Figure 60, Figure 61, Figure 62, Figure 63, and Figure 64).

V.2. Lighting

The animation sequence is made up of three continuous CG scenes to show lighting adapted from the following three films: *Citizen Kane*, *The Godfather* and *Days of Heaven*. The setting consists of four columns standing in the middle of a huge room. Empty pedestals placed around the columns make up a museum-like atmosphere.

Fig. 60. Still from render of character model full body.

Fig. 61. Still from render of character model back.

Fig. 62. Still from render of character model head.

Fig. 63. Still from render of character model $^{3}/_{4}$ view.

Fig. 64. Still from render of character model hand.

The character model is sitting atop one of the pedestals positioned in the center of the four columns. Sliding doors seen in the third scene reveal a small fence outside the room. The following section show images of the three CG scenes, along with diagrams illustrating the placement of the lights.

V.2.1. Scene 1 - Citizen Kane

The lighting for the first CG scene is adapted from *Citizen Kane*, in which a low-key lighting scheme is used. There are little fill lights. The high contrast between light and dark, along with the faint silhouette of the character's back, creates a feeling of mystery. The intensity of the lights progresses from dark to light in order to create depth in the scene. To focus attention on the foreground, the far back wall remains in complete darkness. Soft lighting is apparent in the scene, as the shadows remain soft. In the tradition of *Citizen Kane*, beams of light are added, but without an indication of the light source. To achieve this effect, fog was added to two spotlights. Figure 65 shows an image from the first CG scene.

The lighting on the character and background setting is lit separately. The character is lit with three spotlights: a key light, a rim light, and a bounce light. Figure 66 and Figure 67 shows a diagram of the lighting setup for the character in *MAYA*™.

The background setting is lit with nine spotlights. Each pedestal is lit with two spotlights, the columns on the left of the scene are lit with two spotlights, and the columns on the right are lit with two spotlights. Figure 68 and Figure 69 shows a diagram of the lighting setup for the background scene in *MAYA*™.

Fig. 65. Scene 1 lighting adapted from *Citizen Kane*.

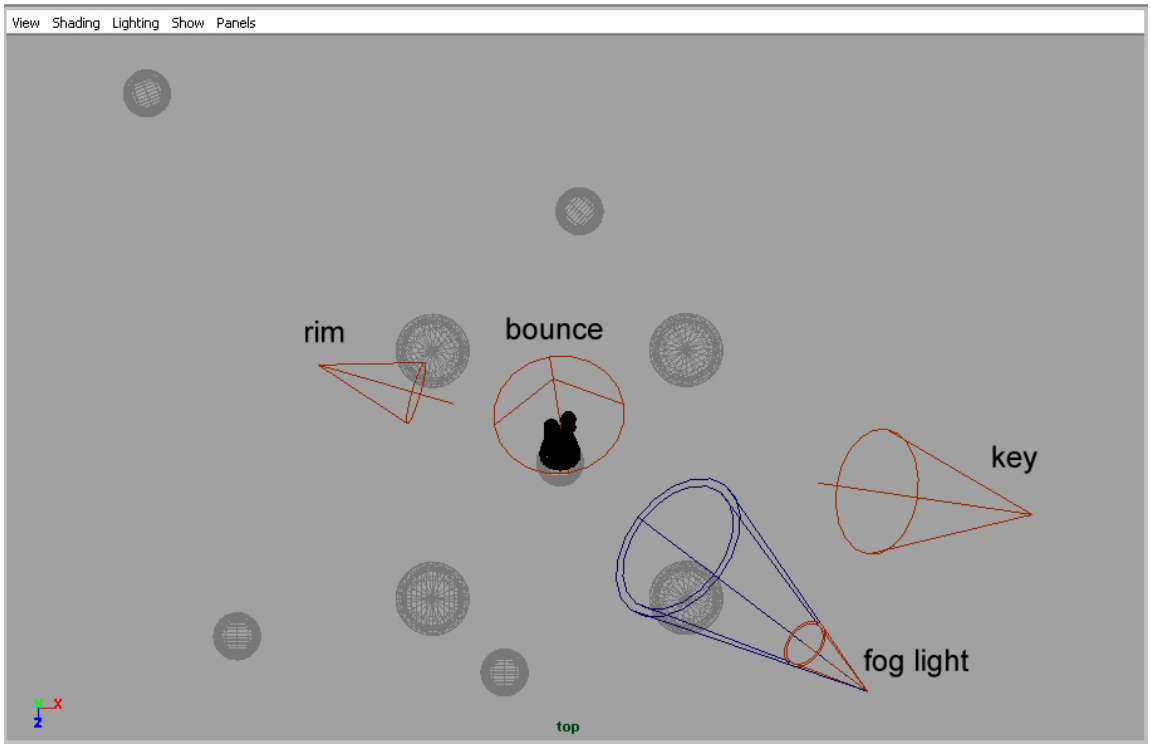

Fig. 66. Scene 1 top view of lighting setup for the character.

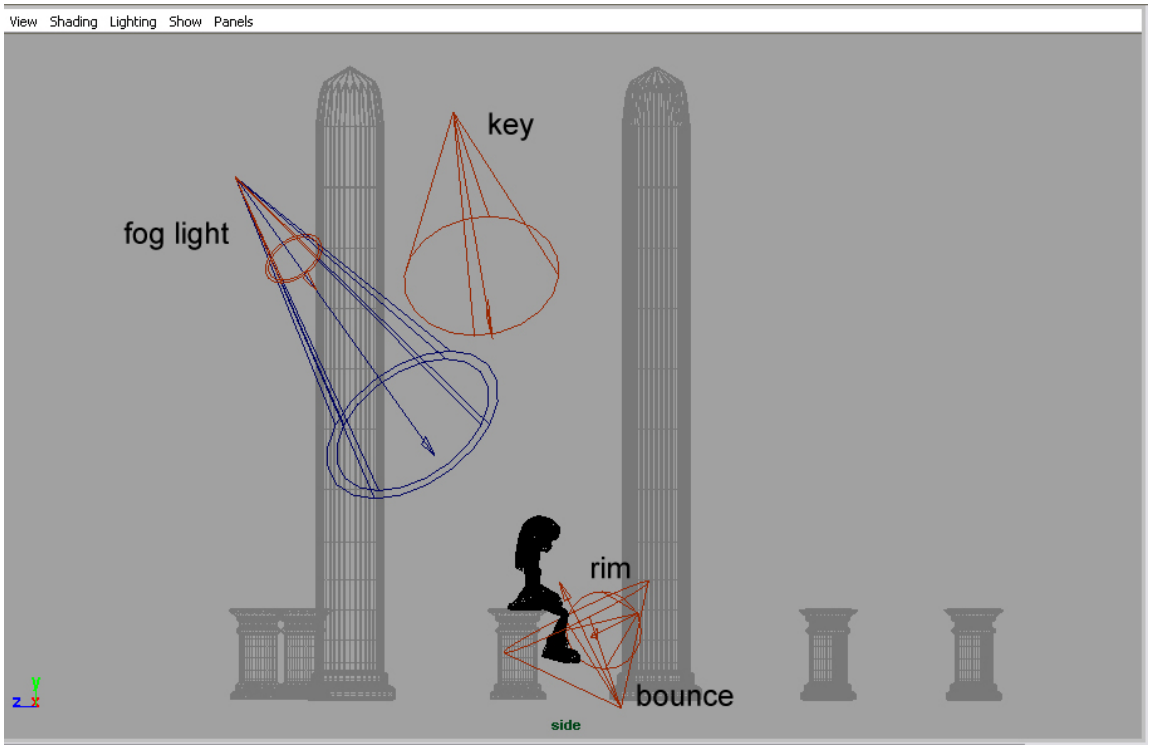

Fig. 67. Scene 1 side view of lighting setup for the character.

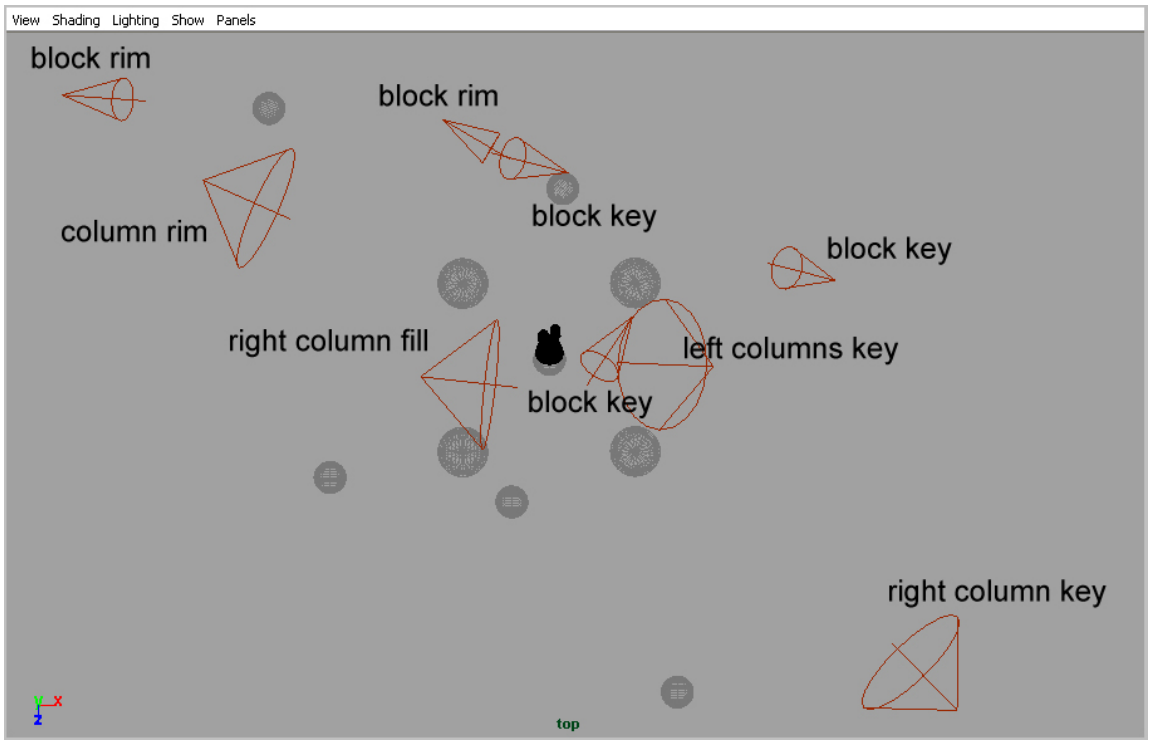

Fig. 68. Scene 1 top view of lighting setup for the background setting.

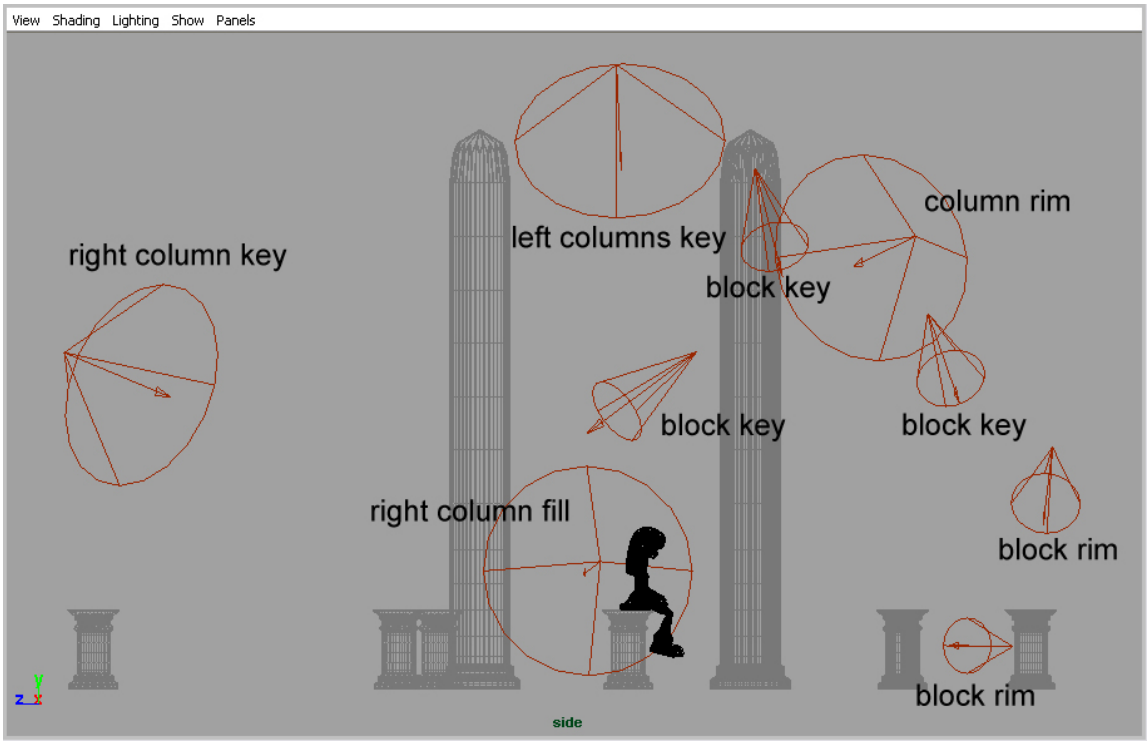

Fig. 69. Scene 1 side view of lighting setup for the background setting.

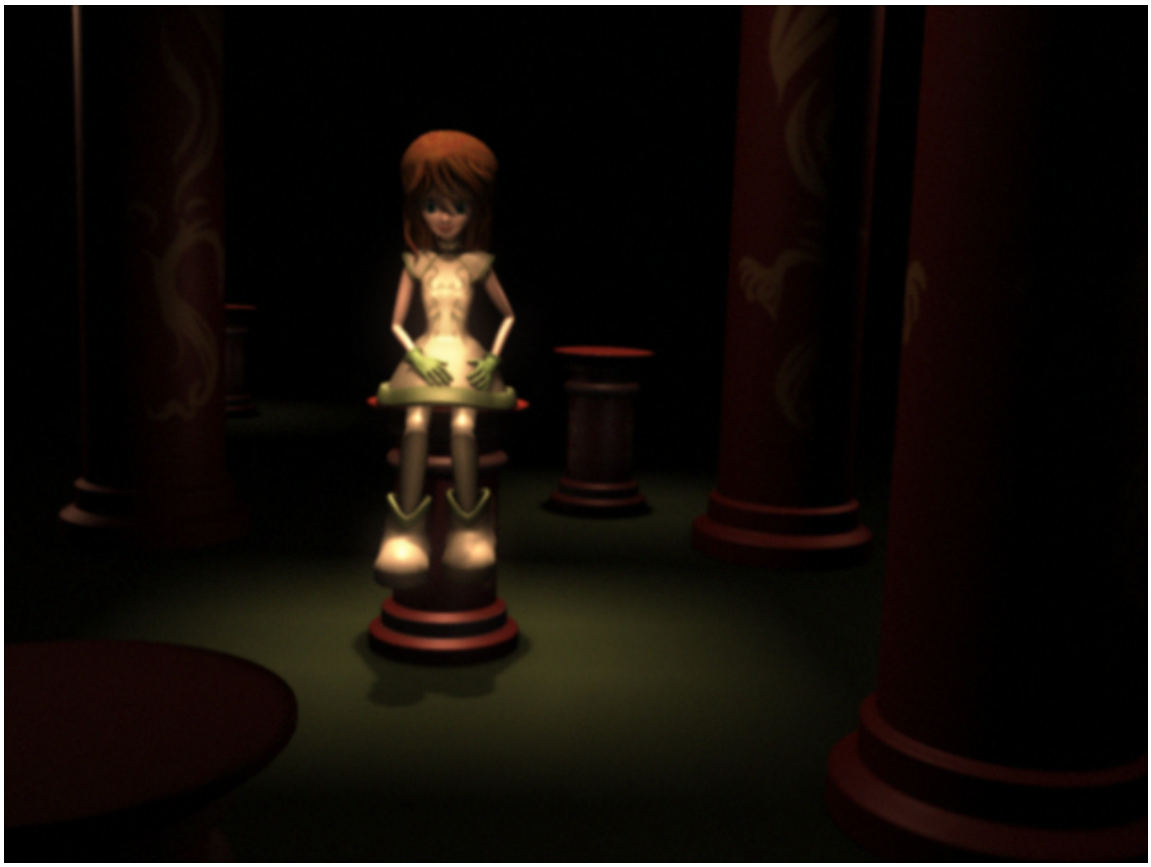

Fig. 70. Scene 2 lighting adapted from *The Godfather*.

V.2.2. Scene 2 - The Godfather

The lighting for the second CG scene is adapted from *The Godfather*. Similarly, following the lighting style from *The Godfather*, a low-key lighting scheme was used. There are little fill lights. The lighting is soft with lights emanating from above. The source remains unknown and results in the dark shadows on the eyes as also noted in scenes from *The Godfather*. A feeling of suspense is created by the unseen eyes and the dimly lit scene. Figure 70 shows an image from the second CG scene.

The lighting on the character and background setting is lit separately. The character is lit with ten spotlights: one key light directly above, one key light illuminating

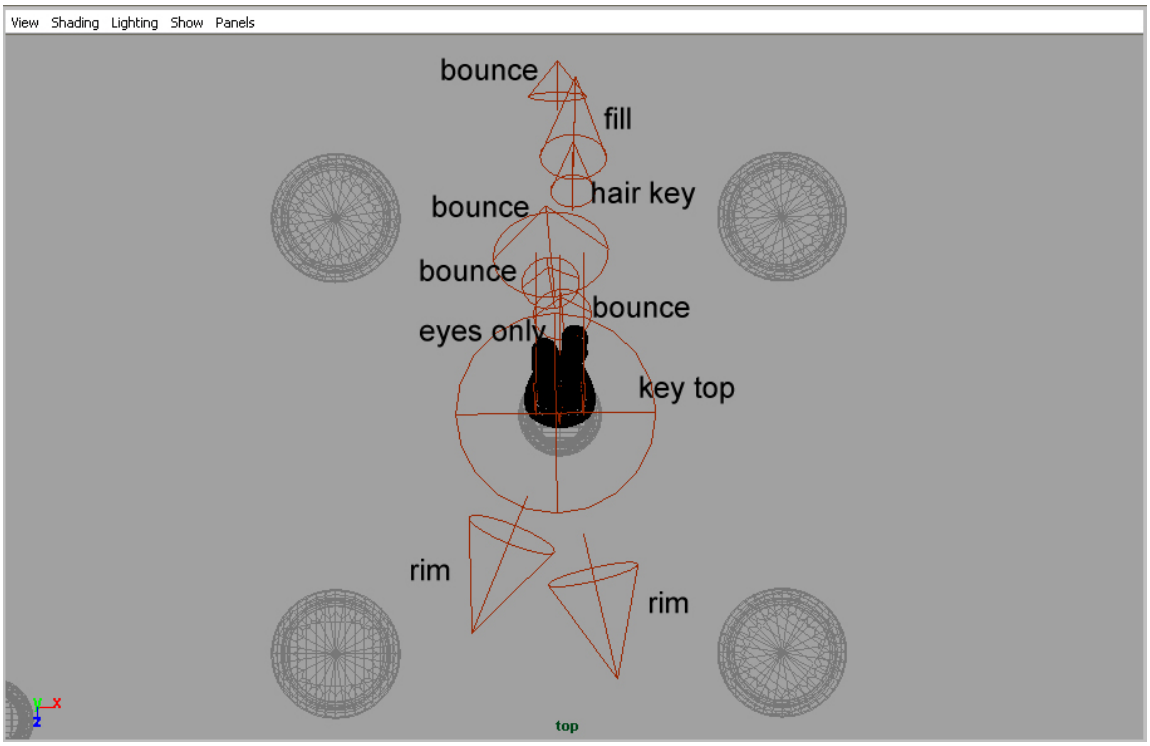

Fig. 71. Scene 2 top view of lighting setup for the character.

only the hair, one fill light in front to the left of the character, two rim lights, four bounce lights, and one directional light illuminating only the eyes. Figure 71 and Figure 72 shows a diagram of the lighting setup for the character in *MAYA*™.

The background setting consists of nineteen spotlights. Each pedestal is lit with three spotlights, similar to the character lighting setup: one spotlight directly above as key, two spotlights in front to the left and right of the pedestal as fill. The columns on the left of the scene are lit with three spotlights, and the columns on the right are lit with three spotlights. Figure 73 and Figure 74 shows a diagram of the lighting setup for the background scene in *MAYA*™.

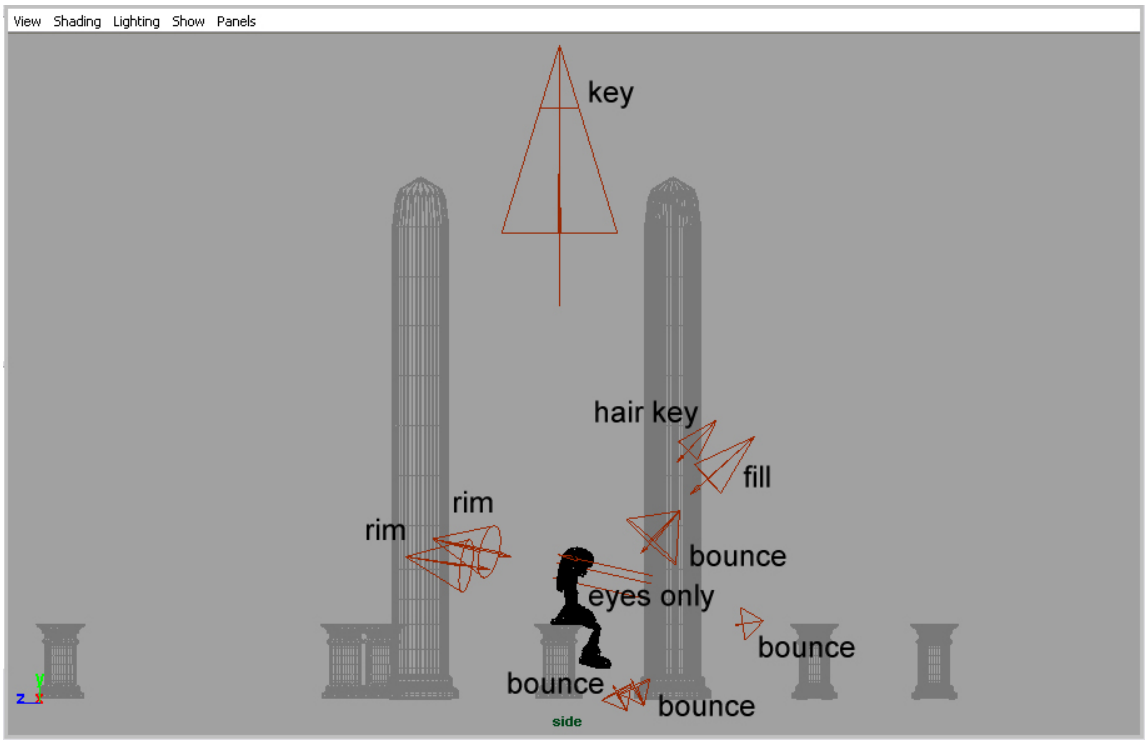

Fig. 72. Scene 2 side view of lighting setup for the character.

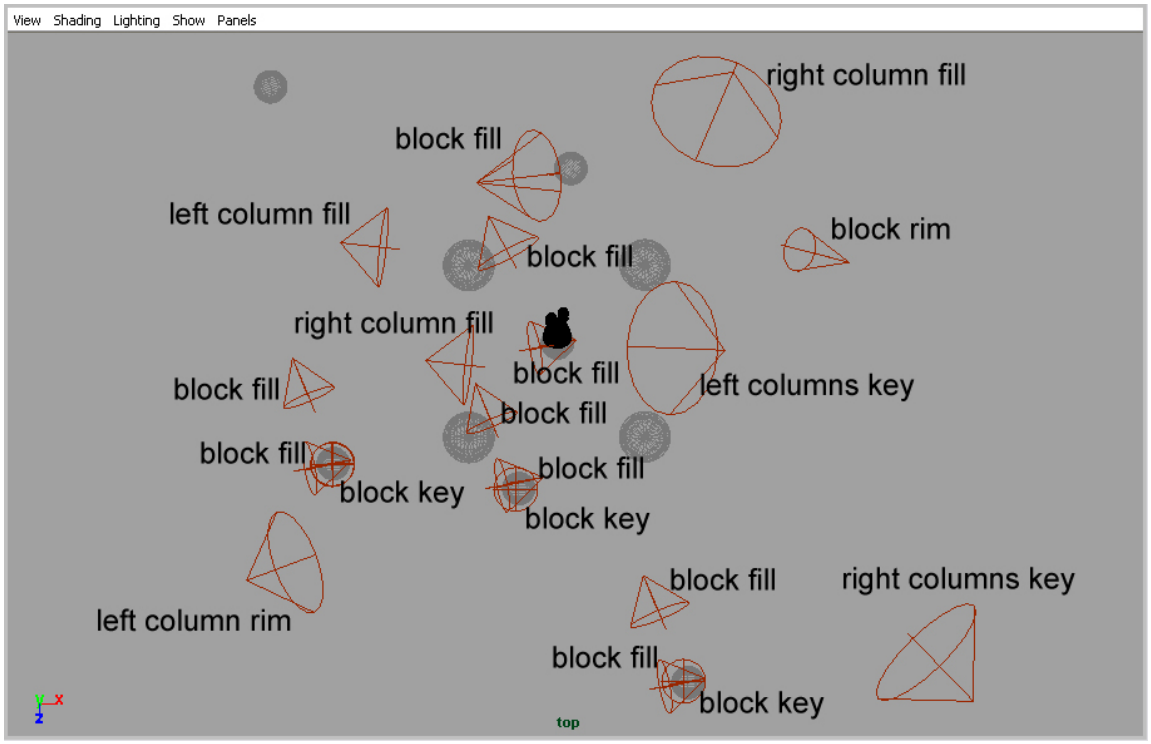

Fig. 73. Scene 2 top view of lighting setup for the background setting.

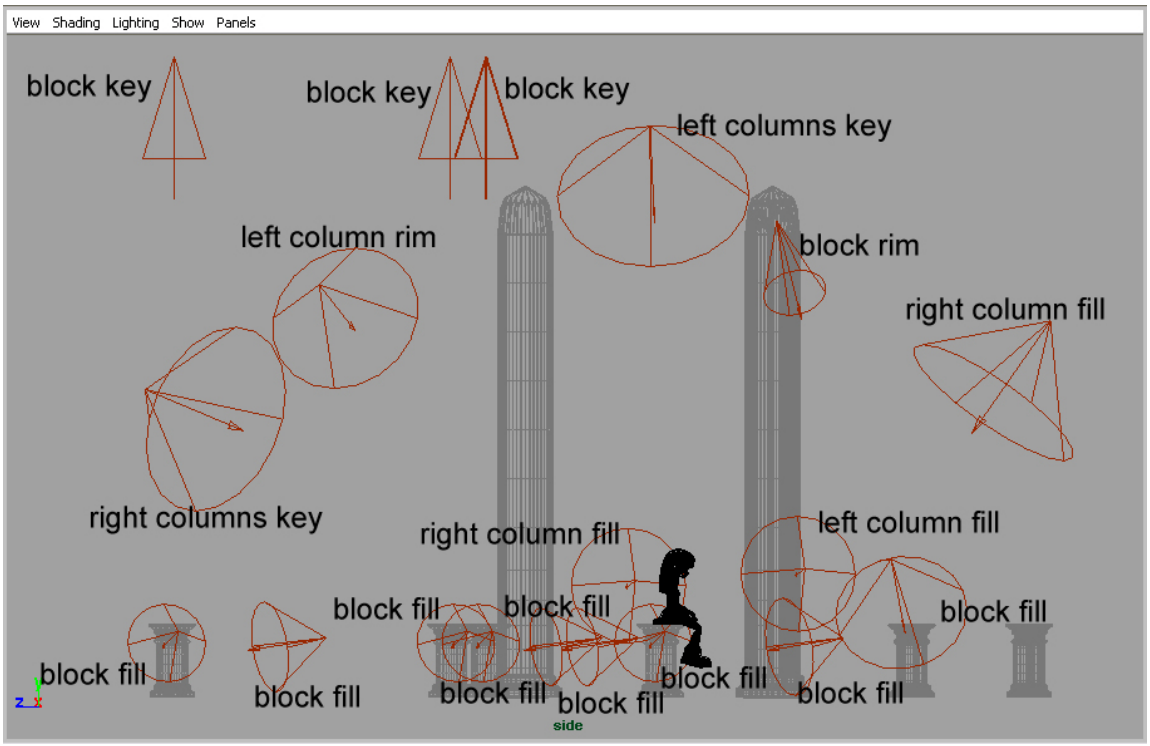

Fig. 74. Scene 2 side view of lighting setup for the background setting.

V.2.3. Scene 3 - Days of Heaven

The lighting for the third CG scene is adapted from *Days of Heaven*. Following the lighting style from *Days of Heaven*, a low-key lighting scheme is also used. The ratio between the key light and fill lights is high. The fill lights are set at a low intensity to create the faint silhouette of the character. When the doors slide open, the silhouette of a small fence is seen in front of a "magic hour" sky. The light is sourcey as it appears to emanate from the sky outside. The time of day depicted is immediately after sunset, thus the light is soft. The character in the foreground is also lit darker than the background setting to create a sense of depth in the scene. Figure 75 shows an image from the third CG scene.

The lighting on the character and background setting is lit separately. The character is lit with eight spotlights: one spotlight as the key light, one spotlight as the fill light, five spotlights as the rim lights, and one spotlight as the bounce light. Figure 76 and Figure 77 shows a diagram of the lighting setup for the character in *MAYA*™.

The background setting is lit with seventeen spotlights. Each pedestal is lit with two spotlights, similar to the lighting setup in the second scene: one spotlight directly above as key, and one spotlight in front to the left of the pedestal as fill. Six spotlights illuminate the columns: one spotlight as the key light, two spotlights as the fill lights, and two spotlights as the rim lights. Five area lights are used to illuminate the floor, walls and fence: one light for the interior floor, one light for the exterior floor, one light for the walls, and two lights for the fence. Figure 78 and Figure 79 shows a diagram of the lighting setup for the background scene in *MAYA*™.

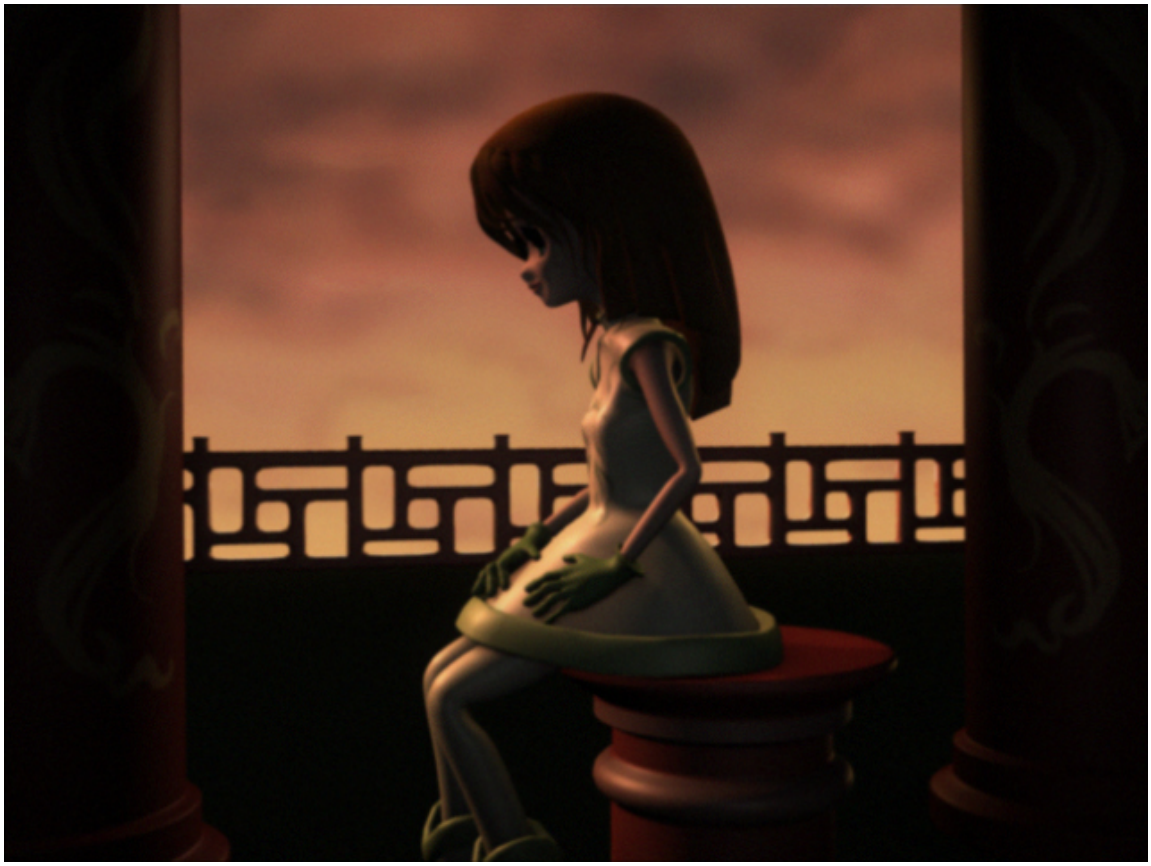

Fig. 75. Scene 3 lighting adapted from *Days of Heaven*.

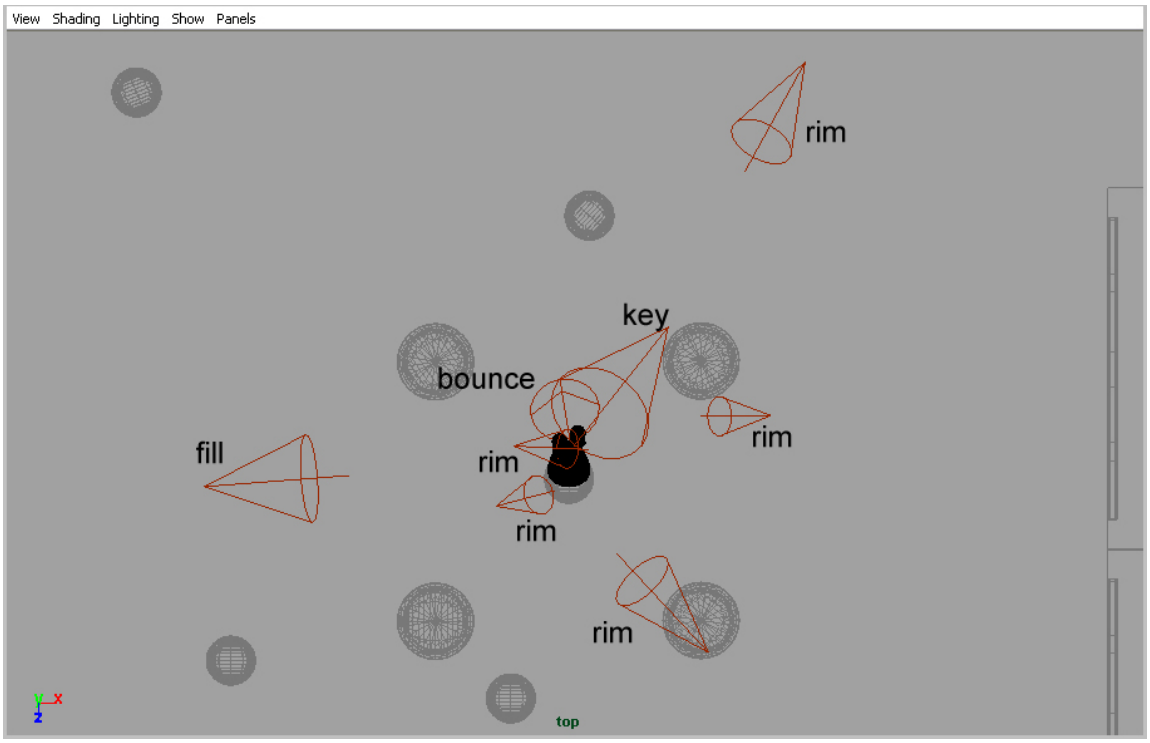

Fig. 76. Scene 3 top view of lighting setup for the character.

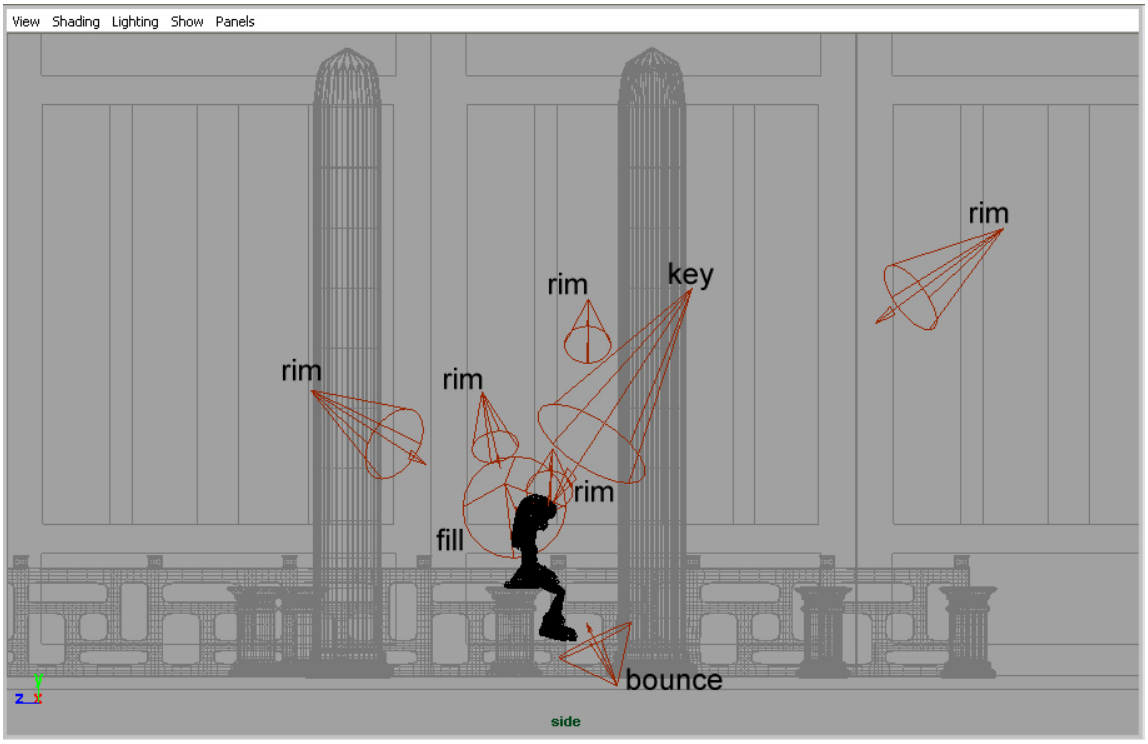

Fig. 77. Scene 3 side view of lighting setup for the character.

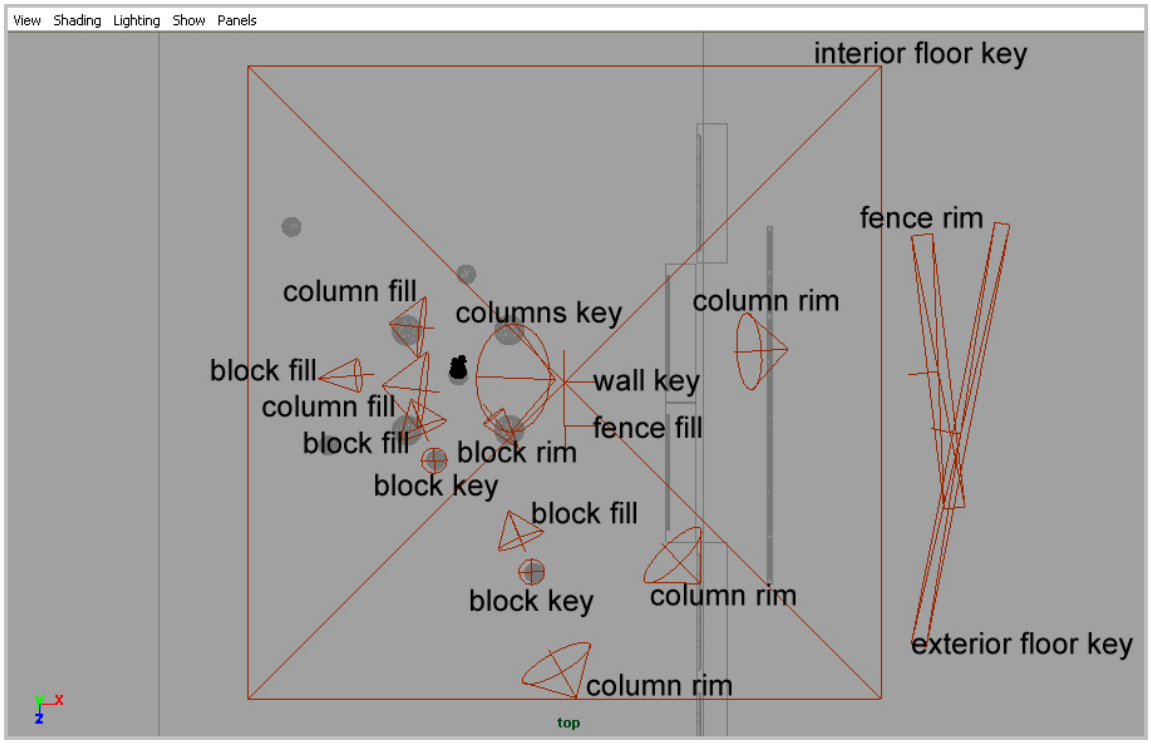

Fig. 78. Scene 3 top view of lighting setup for the background setting.

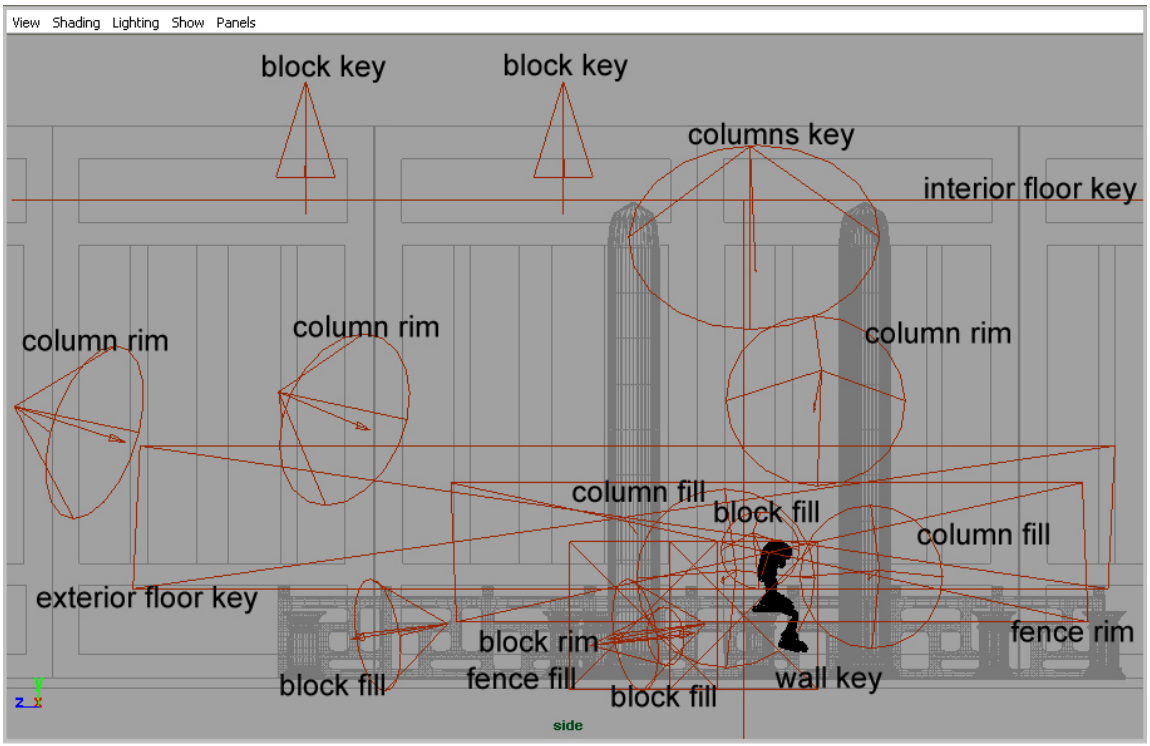

Fig. 79. Scene 3 side view of lighting setup for the background setting.

V.3. Color

In keeping with the color schemes of the films, the color of the lights in the scenes follows the style of the film from which it adapts its lighting style. The lighting in the first scene remains in grayscale as *Citizen Kane* was a black and white film. The lighting in the second scene uses browns, oranges, and yellows like those of *The Godfather* to convey a period style. The lighting in the third scene follows that of *Days of Heaven*, using pink and orange tones to evoke the mood of "magic hour."

V.4. Evaluation of Results

The three CG scenes created were successful in adapting the lighting styles of the chosen three films. The lighting in each scene presented was unique to that particular film. The character model retained the look of animé. The textures remained simple to keep the attention focused on the lighting.

To obtain better results in the lighting, the monitor should have been better calibrated. The colors seen on the monitor used for lighting varied on different monitors. Also, the colors and intensities of the three scenes on the projection screen, which was where the CG piece was presented, appear to display less contrast. Brightness, contrast, and color adjustments of the projected screen improved little. In addition, subtle details of color and lighting were lost.

Overall, this thesis accomplished what was intended: adapting the lighting styles from three cinematic films to animé style scenes in 3D.

CHAPTER VI

CONCLUSION AND FUTURE WORK

VI.1. Conclusion

The development of animé from manga stemmed from readers' desires to see popular manga series animated. Since there are many styles of manga, different styles of animé also exist. Thus, animé characters are not limited to one particular style. They may appear cute, realistic, or graceful. Lighting in animé is minimal and de-emphasized. Recently, a Japanese animation creator, Makoto Shinkai, showed that lighting can set the mood of a story. In American film, lighting a scene is the work of the director of photography, the cinematographer. He or she helps the director represent the film visually. Talented cinematographers use light to enhance a story. Through the process of exploring characteristics of differing animé lighting styles and analyzing lighting styles of differing cinematographers, a visual CG piece was produced. The CG piece showed modeling based on characteristics of animé, and 3D lighting adapted from cinematic lighting styles. The intention was to allow the viewer to identify the CG piece, which applies cinematic lighting to enhance the scenes, as animé in 3D.

VI.2. Implications for Future Research

The research that was accomplished in this study can further be explored in different ways. One experiment can be to choose other combinations of film lighting and animé styles. Another experiment can be to choose a photographer instead of a cinematographer on which to base the lighting style. Tools can be developed to create automatic lighting setups in the CG environment. For example, a lighting

setup can be defined so that a group of lights can be created with minimal tweaking to achieve the look of *The Godfather*. In addition, a tool can be developed to more easily texture models to appear cel-shaded as in traditional 2D animé.

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