

Digital Cinematography

Chapter 1 Digital Cinematography

With the advent of movies like Toy Story, and its increased use in commercials and television shows, computer-generated animation is quickly becoming the latest and greatest cinematic art form. Digital Cinematography teaches computer animators about the tools and techniques at their disposal to give their animation the look and feel of a real Hollywood movie. Starting with the basics of lighting, camera movement, and genre, it teaches how to effectively create interior and exterior lighting, how to light characters to invoke a mood or theme, and even how to light scenes effectively as well as how to cover up modeling and texturing mistakes. Overall, this book is an invaluable guide to the cinematic art of computer animation.

Presenting Images

When planning and composing a shot, you must take many factors into account to predict how the audience will react on a visual level. Of course, you are only guessing and you might be wrong, but the craft of the digital cinematographer is to make educated guesses on how the viewers will respond to visual elements.

Your job as a digital cinematographer is to add flavor to the story. A little backlight here, a wide angle lens there, a simple fog effect, and the images are transformed from a simple narrative sequence into a four-course visual feast.

Film Language

Film has a distinct language of its own that is visual rather than verbal. There are certain responses that are common to everyone regardless of culture.

We all share certain automatic responses to visual stimuli. When you look at the picture, you will immediately seek out the brightest light, the color red, movement, and the human figure. If you put a character in a scene, that is where people will look. If you have two characters, one dressed in brown, the other in red, the viewer's eyes will first be drawn to the red one. Lighting and positioning of the camera are, at their most basic, an attempt to lead the eyes of the viewer to where you want them to look.

Use twice as much light on him as on anyone else, and he stands out again. Have him moving against the crowd, and once again he stands out. Each of these tools—color, light, and movement—will draw the eye of the viewer.

The eyes have acknowledged the camera's existence. This rule is broken frequently in films; it isn't uncommon for characters to address, or at least mug, for the camera.

Aesthetics

The choice of aesthetic determines how you will use your tools to implement the film visually.

Work Principles

As you create images you should always keep in mind three guiding principles:

- simplicity
- consistency
- planning

These are rules not of film language but of the art of cinematography.

Simplicity

Your job is to create the visuals as simply as possible while maintaining the style of the film. Strive to be elegant with your visuals; that is to say, find the simplest, most effective method to create the look of the film. As you plan the look continually ask yourself,

“Is there an easier way to do this? Can I get the same effect from a simpler technique?”

1. Start from the most basic, and add layers of effect as you need them.
2. Begin by setting up two or three lights that affect your whole scene.
3. Refine them until they begin creating the visual concept you have in mind.
4. Begin adding other lights and refining them further to create a more visually complex image.

This approach can save you a lot of work because it allows you to evaluate images as each new cinematic element is added. Sometimes you will achieve the look you want with less work than anticipated. You may find that a scene you had thought would need a complex setup works better with just a couple of lights.

Consistency

People are willing to believe in the reality of a film at least for a couple of hours if the film internally consistent. As long as all the characters and all the scenes follow the same set of rules, viewers are prepared to accept rules that differ from those of the real world. If the rules seem to apply only haphazardly, viewers are not likely to buy into the film, regardless of how much it operates like the real world.

Planning

The key to working effectively and efficiently as a digital cinematographer is preplanning all your work.

In planning the look of your film, test renderings can be an invaluable tool.

Planning the look, and rendering test images might avoid it by giving everyone a piece of what the piece will look like before real production begins. (Rendering your producer, say, speechless might actually eliminate the problem, but is not usually looked on kindly by said producer.)

Reference Material

Study the work of other cinematographers, both digital and traditional, as well as the work of photographers, painters, and other artists.

Watching Movies and TV

Analyzing a film is best done by watching it several times so you can get past the plot and focus on the visuals. Which films to watch is a personal choice; it depends on what kind of visuals you are studying.

1. Choose a film that looked good to you, with cinematic flavor similar to the one you are trying to create.
2. Screen the film, making notes on which scenes worked for you visually,
3. the overall impact of the cinematography
4. specific techniques or effects you want to study.

5. Watch those scenes again and again.
6. Pause the tape and analyze the frame
7. Try to figure out how the lights were set up to create that particular look.
8. Make note of what elements compose that specific visual style.
Is the focus deep or shallow? Did the cinematographer choose a wide lense or a long one? Is the camera invisible, or is it part of the scene?

Other Reference Sources

Film, TV, Painting,-----

2. Introduction to Lighting

When you see a well-crafted image, you know it looks good but you may not be aware of what ingredients contributed to its visual potency. That is the sign of a gifted cinematographer: The craftwork is not immediately obvious because it is well blended with the content of the image. In learning the tricks of the cinematographer, you will learn the ingredients that combine to create a strong visual image and you will learn how to use the tools of the trade to combine and fine-tune those ingredients.

Lighting Instruments

Ambient Light

It is not really light at all.

It is a setting that defines the maximum level of darkness in the scene.

The higher you set the ambient light, the brighter the darkest parts of the scene become.

Ambient light should always be kept very low, as it will flatten the look of the scene if it is turned up too high.

Omni Lights or Point Lights

...is defined in space, and an intensity of light is defined as being emitted from that point.

The settings for an omni lights consist only of intensity and color.

Spotlights

...are defined in space and then adjusted for intensity and color.

Rather than casting light in all directions, a spotlight casts light on one vector only, creating a cone of light.

The cone of the spotlight consists of a hotspot and a falloff.

When you create a spotlight, always make the falloff a little larger than the hotspot. When you are making a tight beam of light, such as a stage spotlight, it can be tempting to make the hotspot and falloff the same size. The problem with this approach is one peculiar to computer-generated images. If there is not at least a small area of falloff for a spotlight, the edge of the circle will often appear jagged or stair-stepped; this is called aliasing.

Antialiasing is a process that smoothes the transition from pixels of one value to pixels of another by creating intermediate values between them. Antialiasing is applied, automatically by most programs, to an image after it is rendered.

Directional Lights

coming from a directional light do not converge at their origin.

The best example of a directional light in the real world is the sun.

Lighting Positions

Key Light

the main source of illumination in the scene—source

The key light is positioned in front and to the side of the subject based on the position of the camera.

Fill Light

to add a small amount of illumination in the dark areas left by the key light.

If the key light is set high, the fill light will be set low.

The position of the fill light is usually a little less than 180 degrees rotated from the keylight on the ground plane.

Back Light

The back light is used to separate the subject from the background.

The back light is positioned a little less than 180 degrees from the camera.

....is not intended to illuminate the features of the subject but only to visually separate it from the background.

Set Light

....is used to illuminate the set.

The set light is usually less intense than the key light.

Take a Look

Key light

Where is the light coming from? the answer is the key light.

Fill light

other lights are intended to modify the effect of the key light without overwhelming it.

The fill light adds some light to the areas the key light doesn't hit.

Back light

The purpose of it is to separate the subject from the background.

It is placed opposite the camera to create a thin line of light around the dark areas of the subject.

The position of the back light is determined by the position of the camera and the key light. It is set nearly 180 degrees opposite the camera so that only a thin line of light will be visible through the lens.

Schematics

Take a Look

Motivated Lighting

Motivated and unmotivated

Motivated lights come from an apparent or implied source.

Unmotivated lights do not have a logical source like back lights.

Light Modifiers

Shadows

Lights in the computer do not cast shadows.

Most of the time you want the key light and any other obvious light to cast shadows because this looks more believable to the viewer.

Negative Lights

In the real world all lights are positive and additive.

...decrease the amount of illumination in the area they affect.

Projector Lights

Project lights shine an image through the instrument as if it were a slide or movie projector. By assigning a bitmap to the light, you modify the color and intensity to correspond with the bitmap.

Projected bitmaps can also be used to break up the regularity of a light. In the real world the combination of atmosphere and complex surfaces means that the light on an object rarely looks even. In the computer world you must work to achieve that slightly dirty, organic look. Projecting a bitmap that is just some random gray variations can help greatly in achieving this effect.

Chapter 3--Introduction to the Camera

Lenses

The longer the angle of a lens, the smaller the FOV(Field of view)

Standard Lenses

Standard lens is 50mm####This is neither long nor wide, but sits right in the middle.

The human eye actually has a slightly wider FOV than this, approximately a 35mm or 40mm lens, but 50mm is what we are used to seeing as normal when watching movies or looking at photographs.

The FOV for a 50mm is about 40 degree.

Long Lenses

Wide Lenses

Compare and Contrast

Camera Heights

Camera Angle

Camera Roll

Depth of Field

Depth of field is a phenomenon that occurs when you use real lenses to capture images on film. DOF is a measurement of how large an area of clear focus you have in front of the camera.

Chapter 4----- Film Genres

Film Noir

is the visual style used in the classic gangster movie.

Traditionally it imparts a dark mood and uses a lot of contrasting light and shadow to create a strong, graphic look. The subject matter tends to be dark and gritty, contrasting black and white- good and evil with little gray area.

.....is often achieved with single-source lighting.

Horror

dark mood,

often uses lights streaming in from behind a character to create a silhouette.

Catoons and Comedy

Traditional animation uses dark outlines around cartoon objects to separate them from other objects in the scene.

Comedy lighting is very flat and everything is bright.

add a lot of light to the scene.

Shadows can be used to add texture without making the scene darker.

Strong fill lights can be used to make sure the characters are always evenly lit and that the shadowed areas don't become too dark.

A wide-angle lens distors the image, making it more stylized, and also helps to separate foreground from background.

Cinema Verite

is like that of a documentary, with existing light and hand-held cameras used to capture pieces of real life on film.

The movement of the camera is a key element in a verite style.

.....The endIt is not necessary to continue to read this book.