Public Preview

This is the first chapter of the Blender Tutorial Guide to be published in june 2000 by Not a Number.

This Tutorial Guide is aimed at new users and together with the Blender Tutorial Guide #01 covers all aspects of using Blender. You don't need the Blender Manual to work with this guide, although it is recomended to have it as a reference.

The tutorial guide will contain 6 gallery pages as well as 20 tutorials about modeling, rendering, lighting, animation and plugins programming. The guide is 100 pages long and will have a full color magazine format for your reading pleasure.

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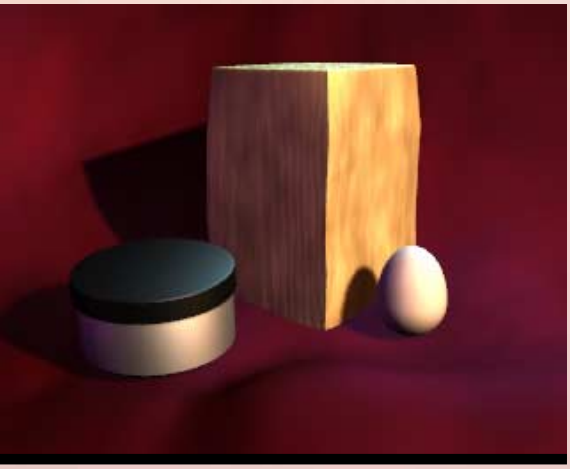
You can buy the printed tutorial guide at the Blender internet shop: http://www.blender.nl/shop/

Lighting Recipes



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Level: Intermediate
Topics: Spotlight, Halo, Sun, Hemi

Introduction

To achieve stunning realism in our 3d images, we must carefully adjust the lighting on a case-by-case basis, depending on the content of the scene. Often however, we are more interested in a result that looks "cool" than one that is technically "correct". To this end, we will look at a few simple lighting schemes that can be used as starting points for your own compositions.

(Fig. 1) shows the scene we will be working with. It contains several different materials and some simple geometric shapes: a block of wood, an egg and a steel photographic developing tank (for information on making beveled edges, check out the Smoothing Tute). At the moment, the scene is lit by a single white spotlight. This produces a high contrast image, with bright-white highlights and pitch-black shadows. Though contrast is usually good, we sometimes want to play with the colour temperature (blue/green tints are considered "cool" while red/orange tints are "warm").

General Tips

Here are some general tips to keep in mind as you work.

You will need more than one light. In fact, you really shouldn't have less than three or four.

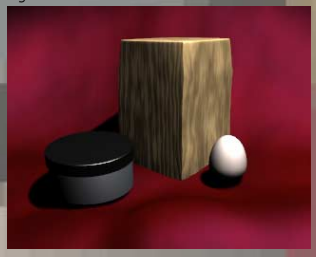
Your lights should be different colours. I almost NEVER use pure white light sources. They make images look flat and lifeless.

High energy lamps are your friends. Your key lights and your rim lights should be in the 2.0-4.0 range. If they seem to be completely washing out your materials, your lamps are either too close, or you may need to turn down the REF factor on your materials.

You should have at least one shadow-casting light. However, do not add too many or your scene will look like a cheesy 60's episode of Star Trek. A general rule is to add one shadow lamp for every three non-shadow lamps in your scene.

EXPERIMENT! It costs nothing except a couple of seconds to play with your lamp settings and to make a few test renders. You may discover something you weren't expecting. You can always try out different lighting schemes on different layers so you can play with new settings while keeping your existing setup intact.

Fig. 1



Mega-Saturated Lighting

Alright, I'll admit it. I'm a kid at heart, and I like to see images with bright colours that really jump out of the screen. To this end, my personal .B.BLEND file is set up with a default lighting scheme that is a variation on

Fig. 2

Fig. 3

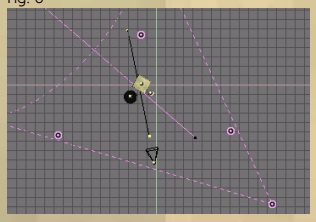


Fig. 4

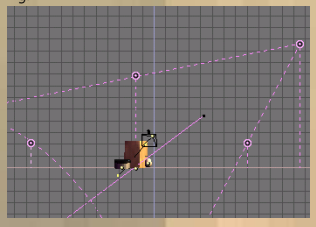
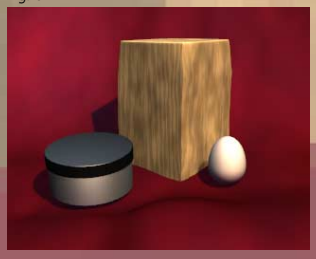


Fig. 5



the 3-light setup proposed in the Basic Scene Lighting article in Blender Tutorial Guide # 01. The main difference is that the lights all have very strongly saturated colours. This produces somewhat "cartoony" images (similar to the lighting schemes from Spyro the Dragon), but creates a nice dynamic starting point for exploring further lighting options (Fig. 2).

If you prefer a more subtle effect, you can reduce the saturation by decreasing the distance between the RGB sliders when setting up your lamp colours: the closer the sliders are to each other, the closer the resulting colour will be to grey (i.e. less saturated).

Though this scheme can make pretty much any model look good, it doesn't take any actual light sources into account, and is not well suited for final or realistic renders. It works very well with cartoon or comic-book style models.

The main light or the key light is a high-intensity shadow-casting SPOT lamp with a slightly warm colour. This is positioned in front of the object and slightly to one side.

Three LAMPS are placed in a triangle around the object. Behind the object, above it and opposite the camera is a high-energy blue rim light. On one side of the object, a low-energy purple LAMP adds temperature to the shadows, while on the other side, a low-intensity orange LAMP augments the key light (Fig. 3), (Fig. 4).

Day Lighting

Day lighting can be deceptively tricky. Our intuition tells us that placing a single white shadow-casting light in the scene should be enough. The problem is that lighting in CG does not work the same way that it does in reality. To achieve the proper effect, we will need to add some light sources in places one might not normally expect (Fig. 5).

First of all, we use a couple of warm SUN lamps to establish the basic lighting in the scene. We use SUN lamps rather than SPOT lamps to ensure an even distribution of light. Note that the position of the sun lamps doesn't matter, but their orientation does. A single SHADOW ONLY spot lamp provides the shadow. If the shadow seems too dark, you may need to play with the ENERGY setting of the shadow spot (Fig.6 , Fig. 7).

Fig. 6

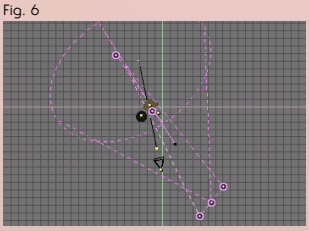
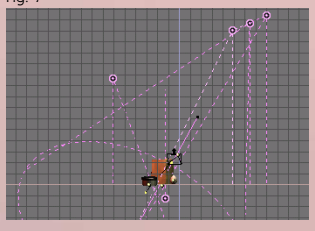


Fig. 7



Opposite the "sunlight" lamps is a HEMI lamp. This one has a cool (blueish) tint. This is used to simulate the ambient light reflected by the sky. It helps to fill out some of the overly dark shadows seen in (Fig. 1).

An additional purple SUN was placed below the scene aiming upwards. This is specific to this scene, and represents light being reflected by the magenta-coloured cloth.

Night Lighting

Perfect night lighting is actually easy to achieve: simply remove all lamps from the scene. Though this may be "correct" it certainly doesn't look good (in fact, it doesn't look like anything but a black screen). So we will have to fake it a bit. In this sample we will be considering light from the moon/stars as well as from a campfire or other auxilliary light source (Fig. 8).

The basis for this scene is a high-energy blue SHADOW SPOT lamp placed directly above the scene and pointing downwards (Fig. 9), (Fig. 10). This represents the moonlight or starlight coming from above. If this seems too bright, consider the "night-time" scenes in movies or television shows. When the actor turns off the bedside lamp, you can still see the scene. That is because the set is being lit by massive blue spotlights. If they weren't present, you wouldn't be able to see anything!

A high-energy blue LAMP is placed to one side of the scene and behind it. This serves as a rim light which helps define the edges of the tank and the egg, which might otherwise fade into the backdrop.

To add some colour contrast to the composition, a high-energy orange SHADOW SPOT is placed to one side of the scene, slightly in front of it. This will be the "fire" that we spoke of earlier. It would also work in a sunset scene.

Once again, a low-energy magenta HEMI lamp placed beneath the scene, pointing upwards accounts for the light reflected by the cloth.

Mood Lighting

Nothing adds atmosphere to a scene like a HALO lamp (Fig. 11). We will use one in this final scene to give the impression of a smoky bar (or possibly an incense-filled wizard's lair). This scheme could be converted to a "horror" mood by moving the key-light below the level of the camera and shining it upwards.

The key light is an halo-enabled, shadow-casting SPOT lamp with a high intensity. This is situated above the camera, pointing at the scene. A purple lamp with medium energy acts as the backlight.

The object itself is flanked by a medium intensity orange lamp and a low intensity green lamp. The front of the object is filled in slightly using a medium intensity olive-coloured lamp.

Conclusion

All of these images were produced by simple manipulation of light sources. The materials and the geometry of the objects didn't change at any point. All of this goes to show that you don't need to spend hours to get decent lighting established. After a while, you will start to get an intuitive grasp of which colours work together and which don't.

Fig. 8

Fig. 9

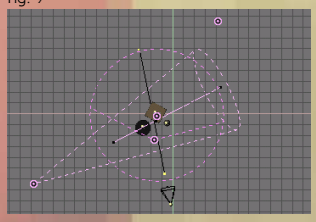


Fig. 10

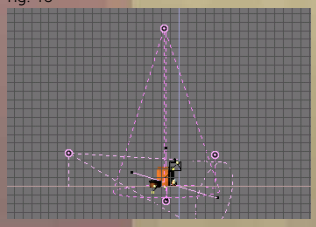


Fig. 11

Fig. 12

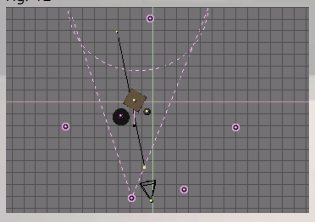


Fig. 13