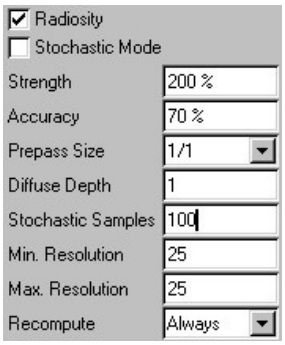
RadiosityTut1MV.html
RadiosityTut2MV.html
RadiosityTut3MV.html
RadiosityTut4MV.html

# MV's Cinema 4D

Scenefile: RadiosityTut2&3MV.c4d.zip

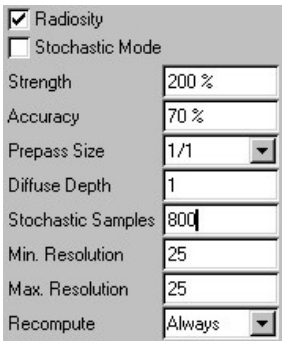
This page will further examine the issue of stochastic samples and splotchiness, and will look at what the accuracy value does.

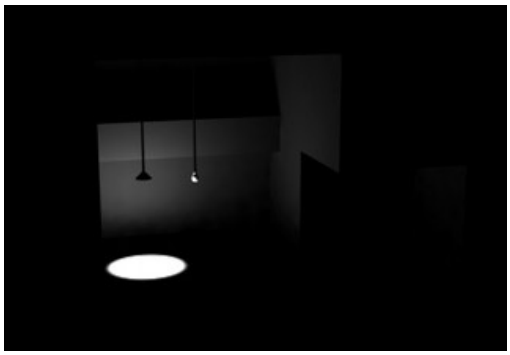
Times shown are the render time on my dual Athlon 1800.62




Next let's turn the omni light off and look at the scene with a single spot light. We see major splotchiness and not just in the corners. Although the number of samples is relatively low, the main problem is the quality of the samples. The stochastic sample value is too low. How do we know? Splotchiness in open areas like the middle of a plain wall indicates you need more stochastic samples, whereas splotchiness in corners and curves indicates you may need more samples there.

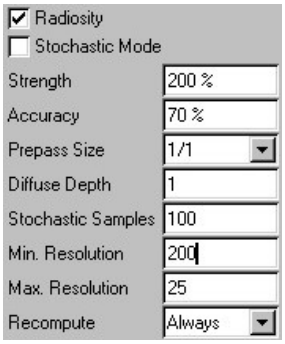
00:05

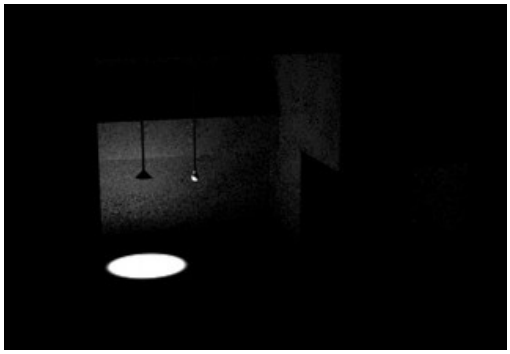


The greater the contrast and the smaller the spot of illumination, the higher the stochastic samples value must be. Why? Let's say a sampled area sends out just three rays in random directions. The likelihood of one of those rays hitting the white spot on the floor is very small. If one or more of the three rays does hit the spot, then that sample area will be bright or extremely bright. If none hits then it will be black. If you have adjacent samples where one hit and the other didn't then you get splotches. Increasing the stochastic samples value to 800 better insures that rays hit the white spot and that the correct percentage of rays hit it as well.

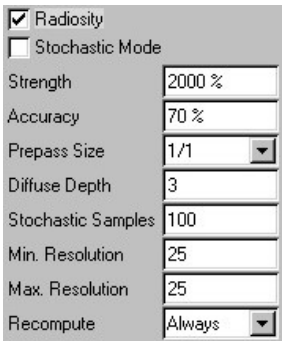
00:28

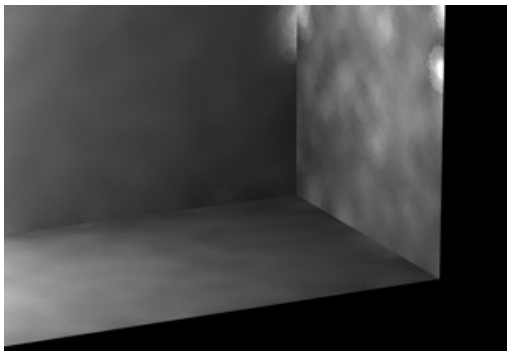


Here we see that just increasing the number of samples won't help if the quality of the samples isn't increased. This illustrates why radiosity can be so frustrating to new users. Increasing the wrong setting can substantially increase render times without any benefit in quality. Another prime example of this is the render accuracy setting, as we'll see later

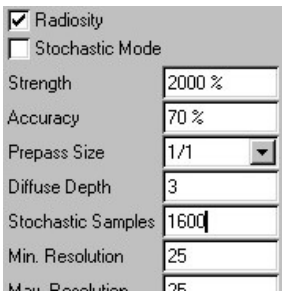
00:30

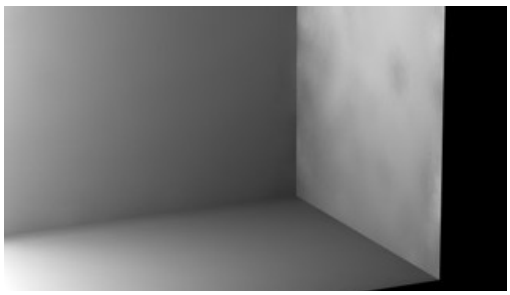


Still using the spotlight, here is a closeup of the room on the right again. I've increased the strength to 2000 so we can see better because the effect from that spot on this area would normally be very faint. I also increased the diffuse depth to 3 because a couple of bounces are required for most areas to see the spot on the faraway floor.

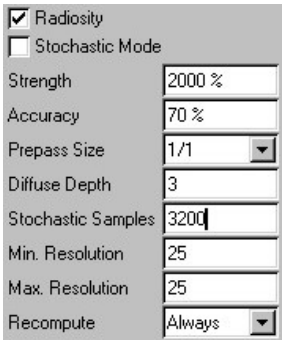
00:08

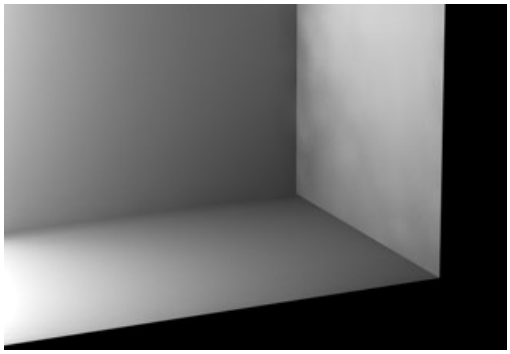


Because the spot is small and far away, we need a large stochastic sample value. Increasing the stochastic samples value to 1600 produces a pretty decent result.

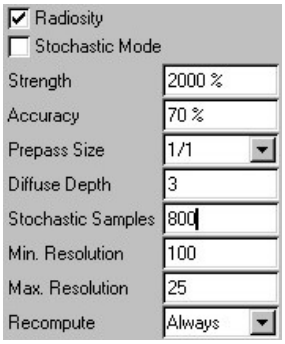
02:47

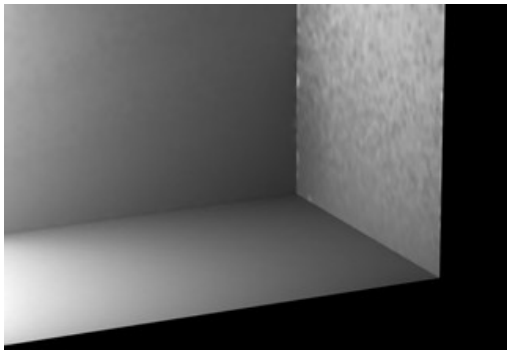


Increasing the stochastic samples value to 3200 produces an even better result, but it might not be worth the additional render time

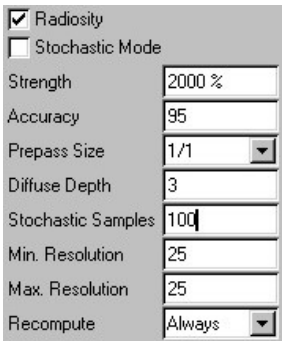
07:00

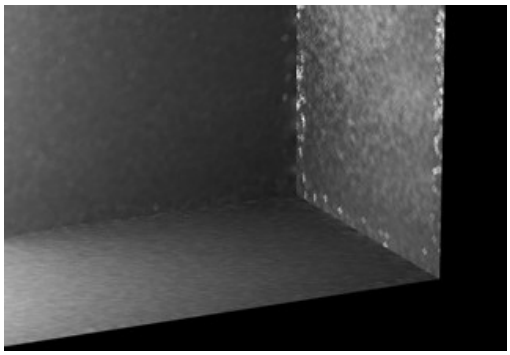


Here the stochastic samples value is scaled back to 800 and the resolution raised to 100. Despite the much longer render time, the result is much worse. The quality of the samples, that is, the stochastic samples value, the number of rays from each sample, is much more important here than the total number of samples.

21:26

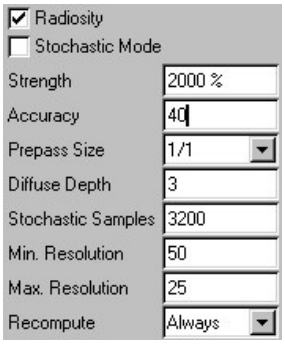


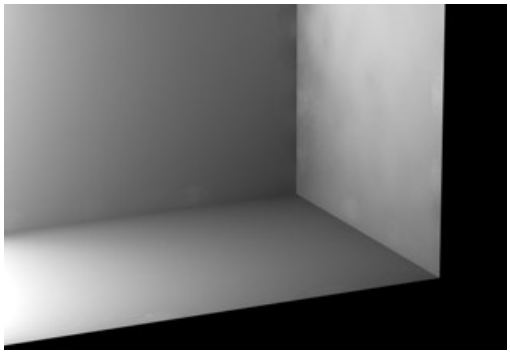



Another pitfall the beginning GI render dude can fall into is thinking that higher accuracy settings mean better renders. As far as I can tell, the accuracy setting only affects the number of samples, and not the quality of the samples (stochastic samples value). In this case increasing the accuracy setting from 70 to 95 increased render time from eight seconds (see 4 renders above) to almost 6 minutes with worse (or at least no better) results.

Remember: Accuracy only affects the number of samples. Increasing this value will only help in those instances where increasing samples would help. In cases where a higher stochastic sample value is required, increasing accuracy won't help you at all!

05:43

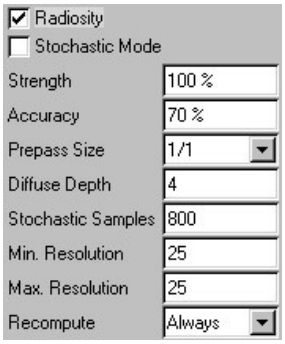


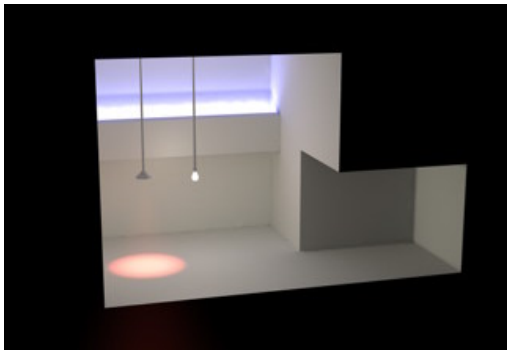



In this render I've reduced the accuracy to 40%, but I offset that decrease with an increase in resolution. The improved quality is due only to the high stochastic sample value.

Note that render tags allow you to set accuracy on a per object basis, thus affecting the number of samples per object, but this will do you no good if you need to set stochastic sample values on a per object basis, which is just as if not more likely. You can't currently set stochastic sample values in render tags. I hope Maxon will add this ability.

06:08



The best way to complete a complex radiosity scene is to determine the optimal values for each light, depending upon it's type, strength, position, etc. Conduct experiments with one light at a time. After you've found the best settings for each light source you can make a better judgment about the needs of the entire scene. In general you want to have enough samples to cover the scene evenly. (LivingRoom9.html) The stochastic samples value required will then depend, in general, upon the contrastiness of the scene. The diffuse depth required will depend upon the number and size of obstructions between samples and light sources. Illuminate objects require one more diffuse depth than standard lights.

05:31

In summation, I hope you've gotten something out of this tutorial. There is still much I don't know, and this tutorial will grow and change as I lean more. I could tell you that Cinema's GI renderer is a Monte Carlo renderer, and not a radiosity renderer, but I've little idea what that means, and it won't help you to make better renders one lick either. In the end you simply need to experiment. Alot. Don't waste your time trying to carry out those experiments with full blown multi-light high poly scenes before ever examining the basic fundamentals with simple objects, one light and one light type at a time.

Next part: Baking radiosity