

Ambient Occlusion with V-Ray

Post-production work is a critical part of the workflow of many 3ds Max users and a common post-production procedure that can dramatically improve both the quality of a visualization as well as the efficiency with which it's created, is **ambient occlusion**. The purpose of this short tutorial is to illustrate the utility of ambient occlusion using the V-Ray render engine.

Ambient occlusion (AO) is the measure of how much of the sky is occluded, or blocked from view, at any given point on a surface. An AO image is always grayscale and is often referred to as a dirt pass because it can be used to add a dirty look to what would otherwise be surfaces that are too perfectly clean to be realistic. As this tutorial demonstrates, it can also be used here to add detail as well as depth to shadows. Creating an AO pass can do wonders for a rendering, and if you use compositing software, an AO pass can be just as invaluable for an animation. An example of an AO pass is shown in the following illustration.

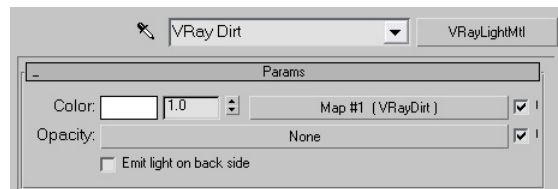


To make an AO pass in V-Ray, we need to apply a special material to all of the objects in the scene. Specifically, we need to create a **VRayLightMtl**, which is a material that casts illumination. The strength and color of the illumination will be dictated by a special map type, the **VRayDirt** map. The VRayDirt map wants to generate a grayscale image where pure black areas represent completely occluded points blocked from view of the sky, and pure white areas represent completely unoccluded points. In between pure black and pure white are areas that are partially occluded. By using this map in the Color channel of the VRayLightMtl, we can create a nice AO pass, like the one shown in the previous image.

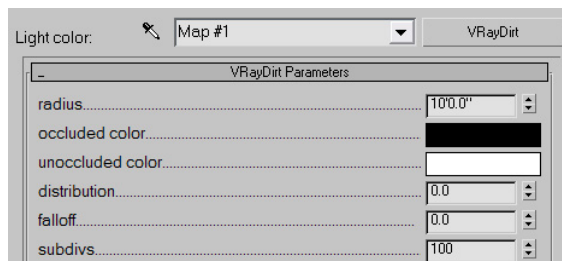
- 1) Open the file **Hampton_Inn-01.max**. For the purpose of this tutorial, the cars have been removed from this scene because they were purchased from Sugar 3D and can not be distributed freely.
- 2) Render **Camera01**. The result should look like the following image. Notice that despite the high quality GI and image sampling used, numerous details were too small to be rendered effectively and the image is a little flat.



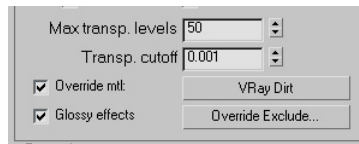
- 3) Open the **Material Editor** and create a **VRayLightMtl** in one of the sample slots.
- 4) Load the **VRayDirt** map into the **Color** channel of the **VRayLightMtl**, as shown in the following illustration.



- 5) Within the **VRayDirt** map, change the **radius** value to **10'0"**. This value determines the area around a point for which the **VRayDirt** map is applied.
- 6) Change the **subdivs** value to **100**. This will provide a smooth and subtle amount of dirt; however, if you want a very noticeable dirt, simply use a lower value to create noise in the map.



- 7) Within the **Global Switches** rollout of the **Render Setup** dialog box, enable the **Override mtl** option and drag an instance of the **VRayLightMtl** into this override material channel, as shown in the following illustration.



- 8) From the **Global Switches** rollout, disable the **Lights** and **Shadows** option. These components of the rendering should be excluded in an AO.
- 9) From the **Indirect Illumination** rollout, disable **GI**.
- 10) From the **Environment and Effects** dialog box, disable the **VRaySky** map that is currently loaded.
- 11) Change the background color to **pure black**. This ensures that no skylight is added to the AO pass.
- 12) Within the **Image sampler** rollout, change the image sampler type to **Adaptive Subdivision**.
- 13) Within the **Color mapping** rollout, change the type to **Linear** and set the **Bright** and **Dark** multipliers to **1.0**. Color mapping must be disabled for the AO pass and the default values now used are essentially the same thing as no color mapping.
- 14) Change the **Min** and **Max** rate to **1** and **3**.
- 15) Render **Camera01** again. The result should look like the 1st image in this tutorial. If you want to use the final AO version of the scene, open the file **Hampton_Inn-AO.max**.

With a raw rendering and an ambient occlusion rendering created, we can use Photoshop to blend the two images together.

- 16) Open the raw rendering in Photoshop.
- 17) Load the AO rendering as a 2nd layer.
- 18) Right-click the AO layer and select **Blending Options**.
- 19) Change the **Blend Mode** to **Multiply**. This mode uses the AO layer to multiply the colors of the layer below it. The result should look like the left image of the following illustration. Notice how much better the details in the image appear, such as the very important grout lines. The effect is a little strong so we can reduce it to our liking.
- 20) Change the **opacity** of the AO layer to **50%**. The result should look like the right image of the following illustration. This concludes the exercise. If you want to see the final Photoshop file, open the file **Hampton_Inn.psd**.



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