Using Your Depth Pass for God Rays and More!

A Technical Paper by Lauren Gisewhite

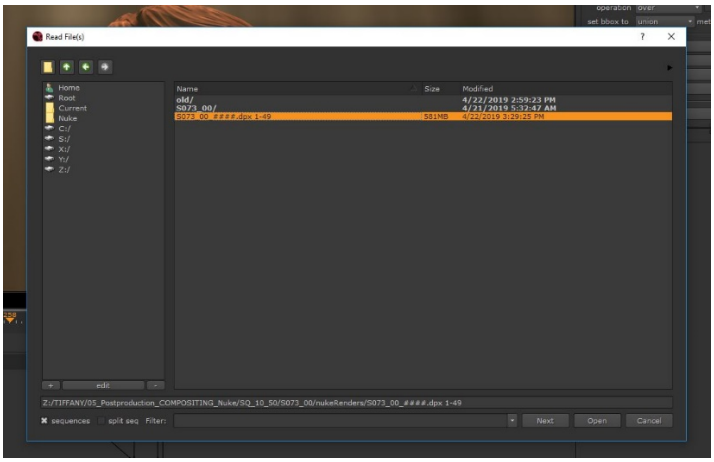
One of the widely known uses for a depth pass (or z-depth pass) is for blurring foreground and background elements in a way that simulates depth of field. This is a popular and common practice in photography, film and other artistic mediums to help give dimension to shots, paintings, and more. A depth pass can be used for more than just blurring objects, it can also be used as an alpha for color correction nodes, grade nodes, volume ray nodes and any other node that has a mask input. This will allow you to "animate" your nodes in a way that gives more dimension than just turning it off and on linearly with values from 0-1.

For a specific shot in the film "Tiffany" (S077_20, aka "The Aladdin Shot") we wanted to show/give the feeling of Pauline emerging from the darkness/shadows and into the light by her walking through the god rays coming from the skylight. The lighting, which was done in Renderman, was a great starting point by already having Pauline walking through a light that animated across her. See the original rendered images below:


As you can see, the volume rays (also referred to as light rays, light beams and god rays) are not in the original rendered image but were added in post using the Volume Rays node in Nuke. To set up your volume rays, first you'll need to create your Read node with the desired image/image

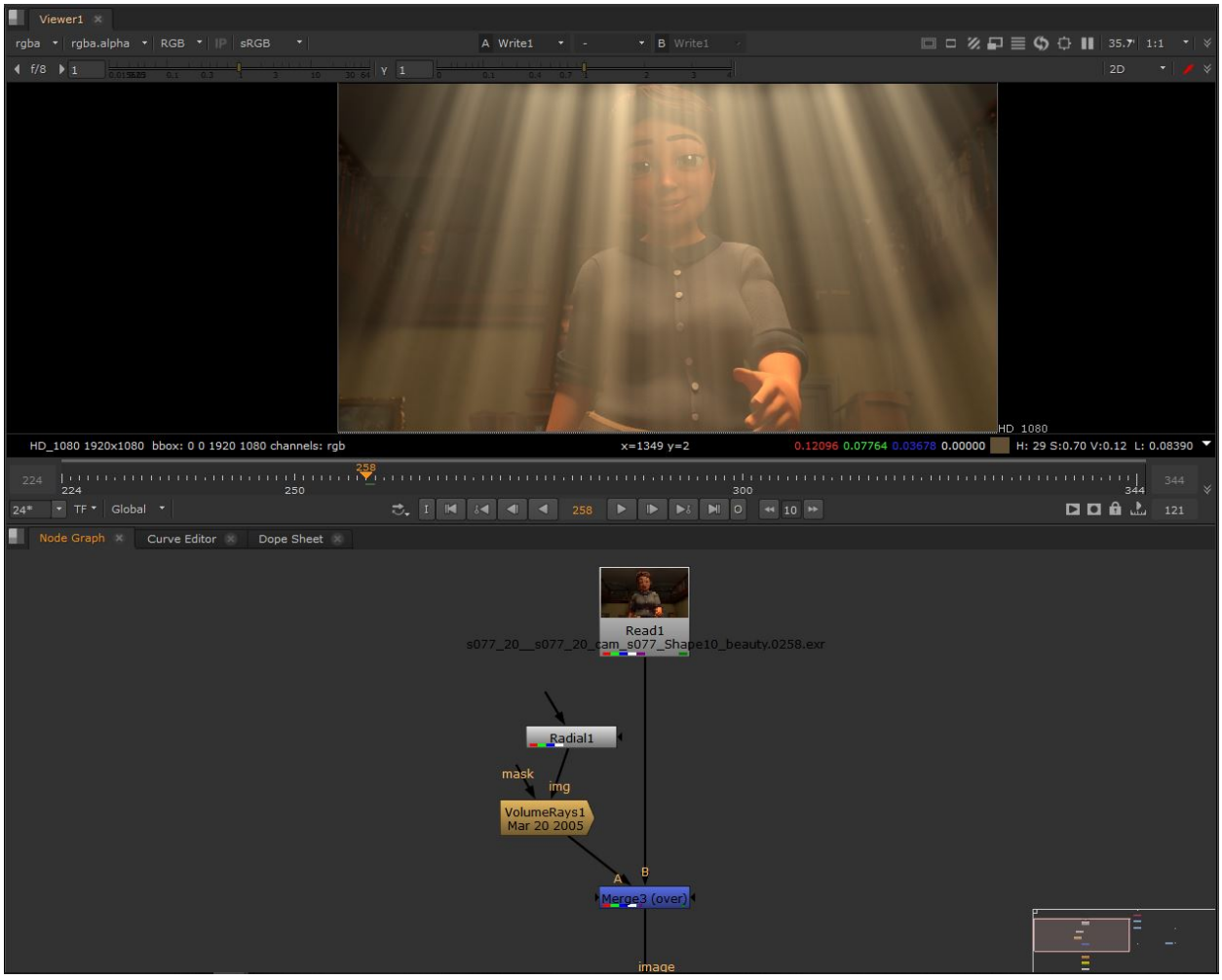
sequence you'll be putting your volume rays over and then you will need to create a volume rays node.

To create a Read node, press Tab > type in Read and hit Enter OR press R for the hotkey. A file browser will pop up and you'll go to the location of your desired images and double click the image sequence or click once to highlight and click Open at the bottom.

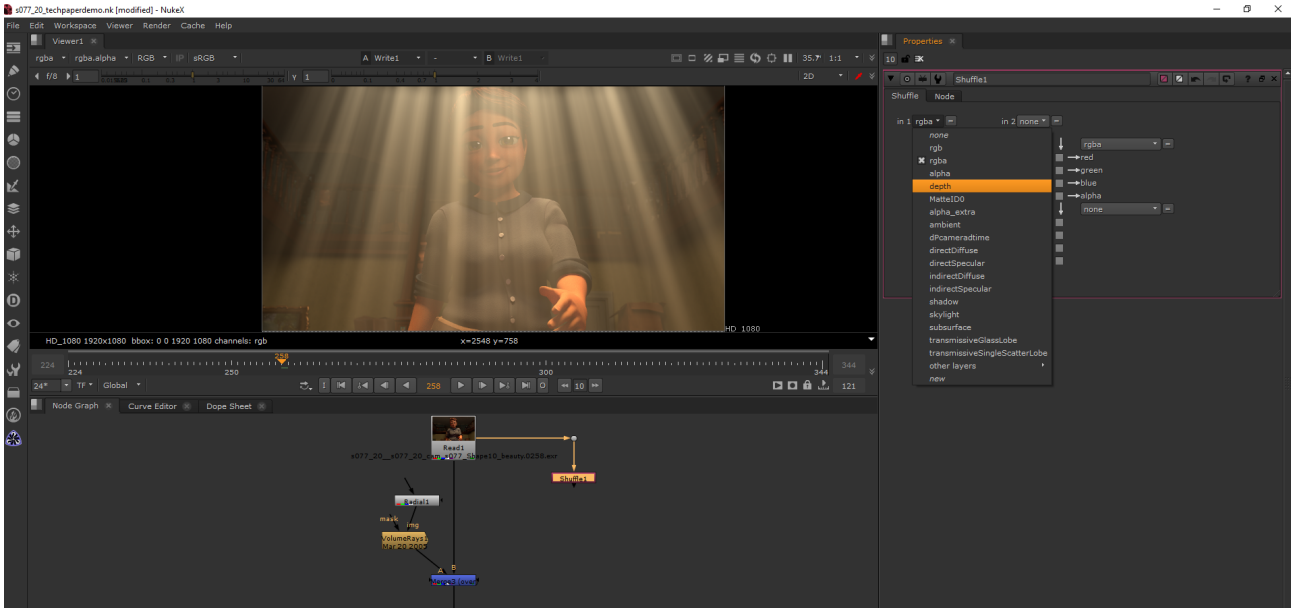


Now hit Tab > type in Volume Rays and hit Enter. This will create a Volume Rays node. You will need to plug in a radial node into the img pipe for your volume rays to show up (just hit Tab > type in Radial and hit Enter)

Create a Merge node (Tab > type in Merge and hit Enter or press M for hotkey) > plug in the A pipe to your Volume Ray node and the B pipe into your read node. Anything plugged into you're A pipe will act as a foreground element and anything in your B pipe will act as the background element. Your Mask pipe/input for your merge node effects your A pipe input which is where we will be plugging in our depth channel information and we want it to effect our god rays, hence we plug in the Volume Rays node into the A pipe. Make sure your merge operation is set to Over.

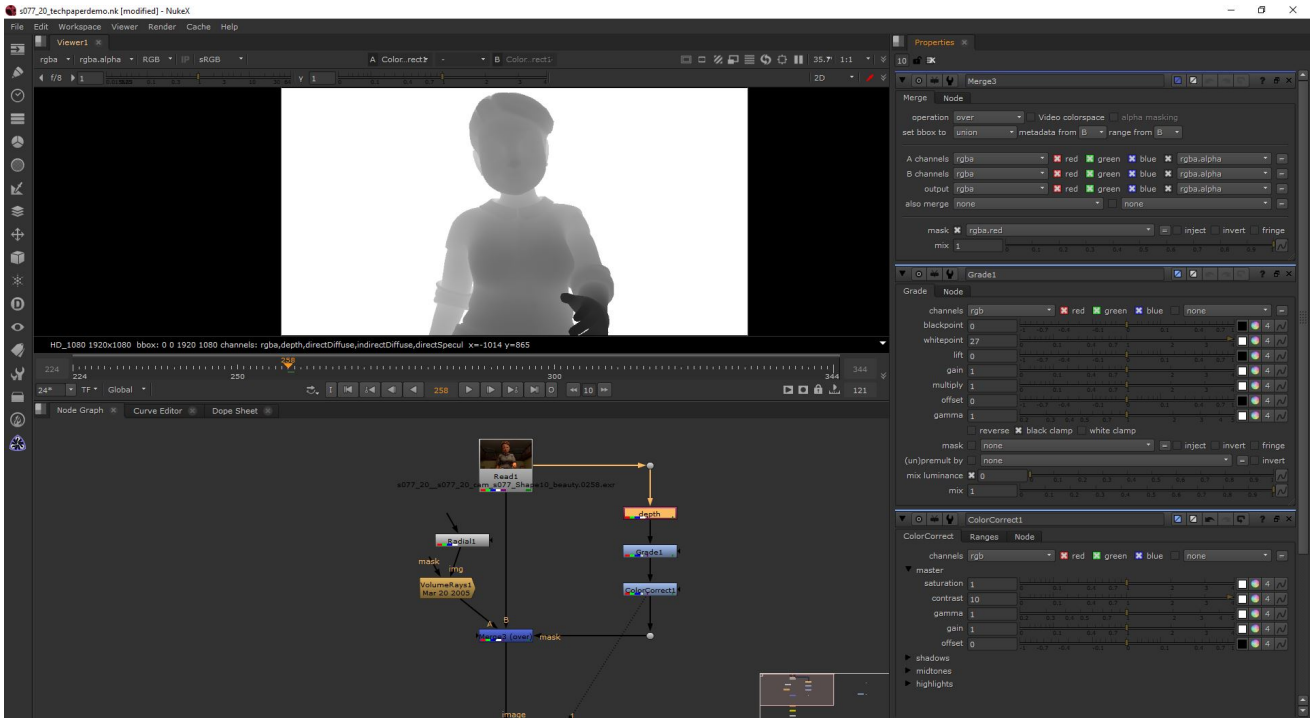


Now we will set up our depth channel to become a mask. First, his Tab > type in Shuffle and hit Enter. Plug in your Shuffle node to your Read node and double click to bring up the properties under the Properties Panel. From the in 1 dropdown, select depth. The Shuffle node allows you to isolate the different passes (AOVs) from your render so you will only be able to shuffle out AOVs you set up in your render settings in Renderman. Name your Shuffle1 node “depth”.



Create a Grade node and connect it to your depth Shuffle node. Click on the Grade node and hit 1 on your keyboard (this will connect your Viewer 1 to the selected node). At first you will only see white on the screen and that's okay, that is how all depth passes render out. Double click the Grade node to open its properties and set the whitepoint to 27. You should now be able to see the silhouette of your scene in grayscale. You will need to set your whitepoint to a high value to see anything and you will need to play around with the values until you find something you like. You can also adjust the gamma or add a Color Correct node (Tab > type in Color Correct and hit Enter) and adjust the contrast. For this scene I set my whitepoint in my Grade node to 27 and my contrast to 10 in my Color Correct node. Since this works in grayscale and will be used as a mask, it will work like any mask typically does. Black means objects will be hidden/transparent and white means objects will be unhidden/opaque and the grey is variations of transparency and opaqueness in between. Take the mask pipe of your Merge and plug in to your Color Correct node (or the last node connected to your depth Shuffle node) and because the depth channel

works in RGB, in the properties of your Merge node, set mask to rgba.red (otherwise your mask won't work)



Now if you go back to your Merge node, select it and hit 1 on your keyboard, you will see the god rays are now masked using the depth channel! We could have animated the mix of the Merge node to linearly make the god rays appear and disappear on Pauline but it wouldn't look as natural or have as much "depth" (for lack of a better term) than using the depth pass as a mask and it "animates" for us! Now she can appear that she is coming from darkness and passing through the light beams as if they were in scene. You can also use this technique for saturation (for example, objects in foreground are more saturated and as objects are further away they become more desaturated), darkness (same gist as saturation) and more! You will have to be careful about "matte lines" or black and jagged edges around objects. They're not too noticeable but you'll need to find the right balance when adjusting your whitepoint and contrast. Depth can have a hard time calculating values with certain pixels and distance which causes these jagged

edges. Sometimes blurring can help (add a blur after your Grade or Color Correct node) but the only other way to fully fix this is to use “deep images” and “deep compositing” which is not totally feasible for this scope of project and I won’t go into too much detail here about it. The pro outweighs the con, the look you get with a depth channel mask is a good pay off for the barely noticeable matte lines.

And that’s how you use a depth pass as a mask! Final images on the next page.