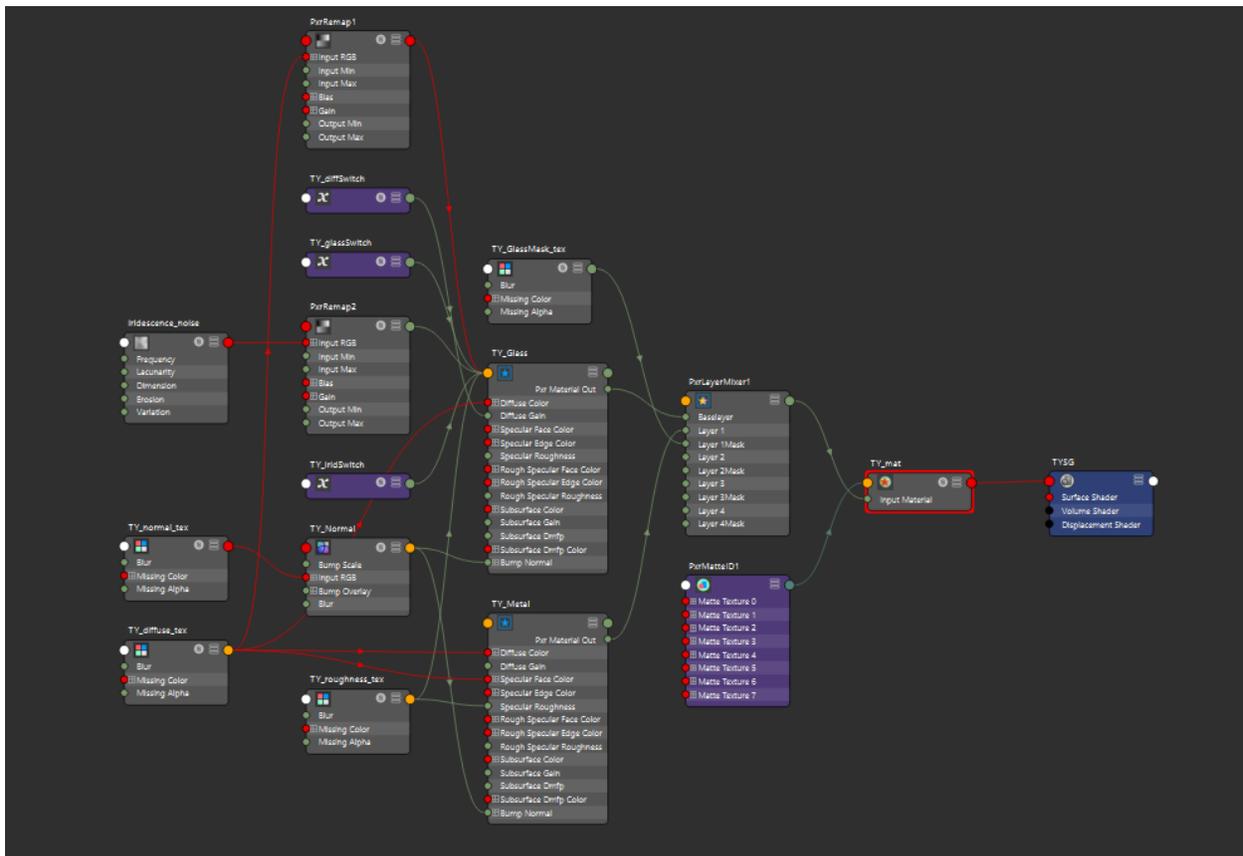


The useful Primvar node:

Primvar stands for primitive variable. It is simply a variable that is added to a piece of geometry to drive data during the shading process.

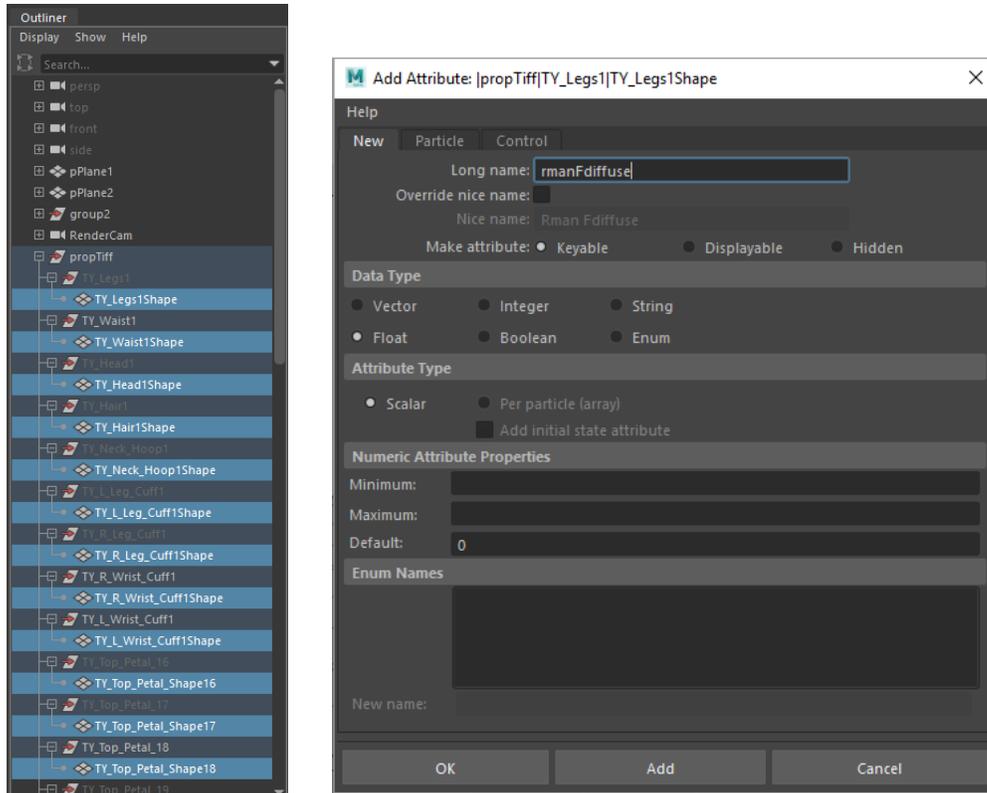
One of the issues I faced involved the direction of the displacement maps. I needed the displacement on the skirt wire to pop outwards and the displacement of the glass hand to go inward. The problem is that you can only displace in one direction within a shading group (the blue node at the very right).



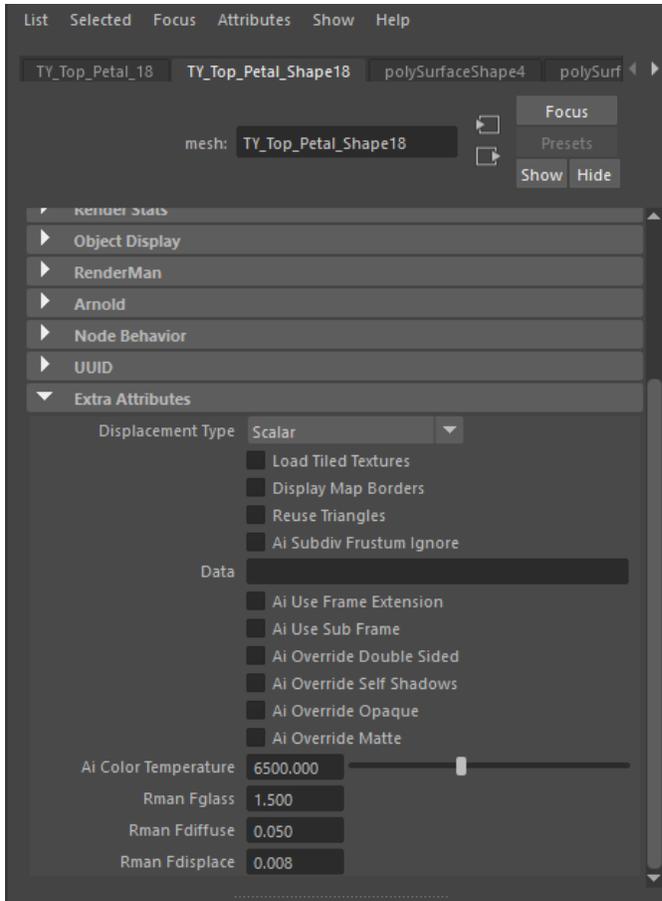
This can be solved by creating one material for the hands and another for the skirt so that they each have their own shading groups, however, I wanted to keep the character file organized by having only 1 material controlling everything. For this I used the PxrPrimvar node (purple nodes on the left). There are many uses for this node but for the Tiffany glass shader I used it as a switch to control the displacement, glass, iridescence and diffuse settings.

To set this up, I selected all the shape nodes for the geometry in Tiffany's body from the Outliner. With these selected, go to Modify > Add attribute. Add the attribute rmanF(name of attribute).

Rman will tell the shader to search for a renderman node, F will create a float value/C will great a color value, and the name of the attribute (diffuse) will search for that word in the primvar node. Click OK.



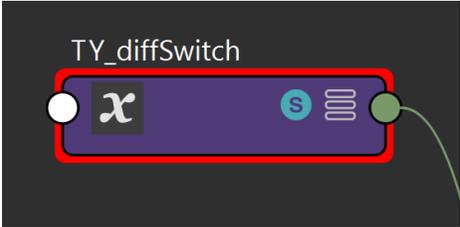
If this was done correctly you should be able to see your attribute under the shape node > extra attributes.



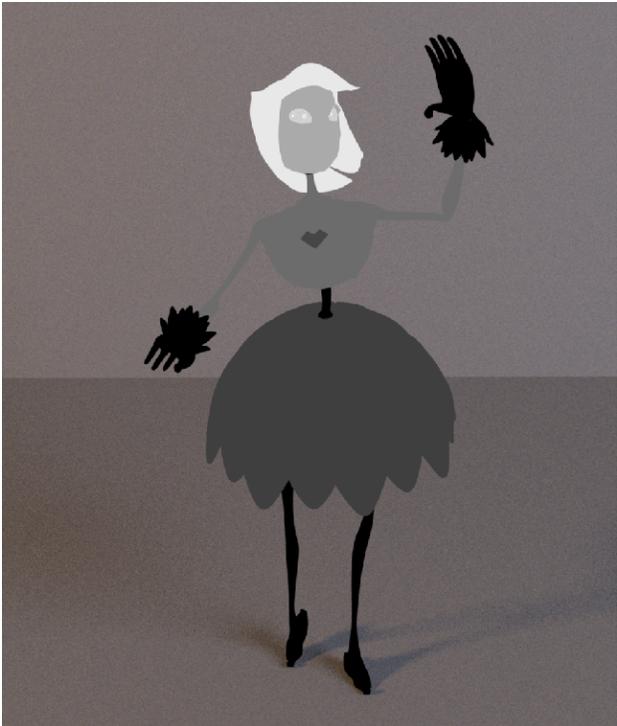
In the hypershade press tab and search for PxrPrimvar. Click on the node and under variable name make sure to type the same name chosen from the step above (diffuse). Connecting the node to any of the settings on the shader will make the primvar be the driver for that data. This one in particular is connected to the Diffuse Gain. Now we have a PxrPrimvar node looking for the attribute “diffuse” on the piece of geometry with the shader connected to it. I chose a float value for this, which means 0 is off and 1 is completely on, the numbers in between create a gradient between the two, and numbers above 1 will be a multiplier for the diffuse gain.



Now we can control the strength of the diffuse value on a per mesh basis directly from the mesh's shape node. To visualize this data you can select the "S" on the primvar node. This will "Solo" the node and render its contribution in the IPR window.

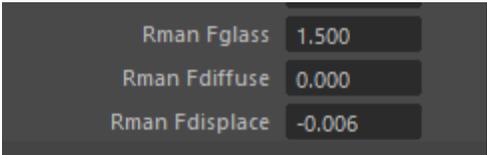


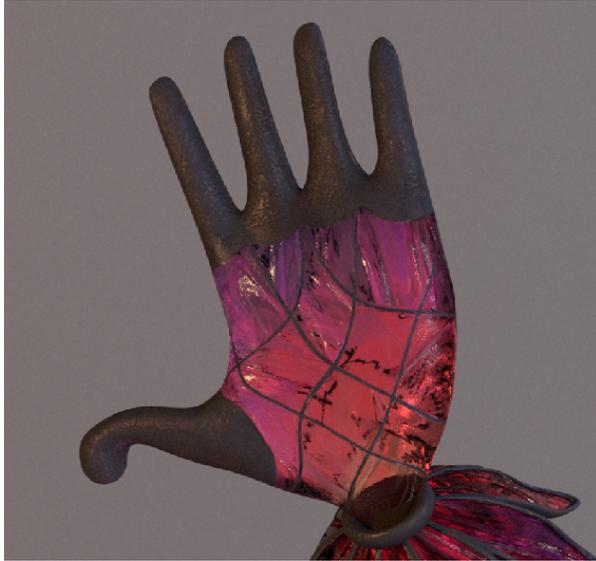
Result render: values of 1 are visualized as white, values of black are visualized as 0



Since the hands are a separate geometry from the skirt I managed to use this method to create a displacement variable that controls the amount and direction of displacement per piece of geometry while keeping 1 shader. These are the results:

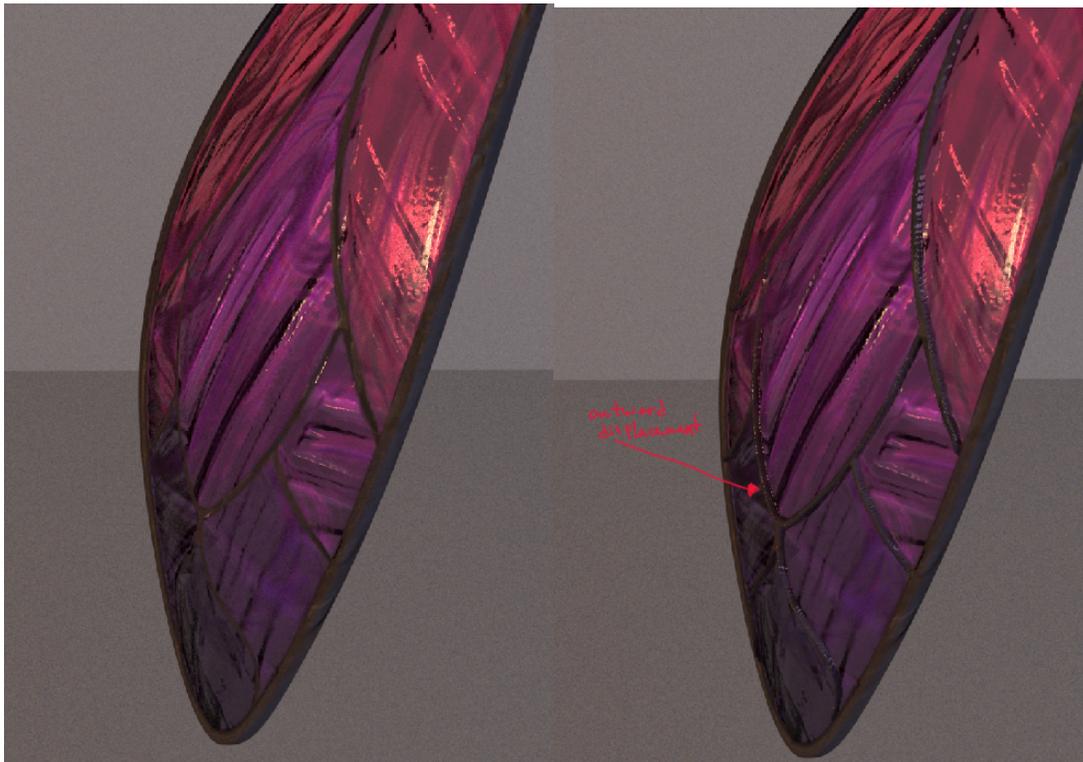
Hand Settings:





Skirt Settings:

Rman Fglass	1.500
Rman Fdiffuse	0.050
Rman Fdisplace	0.008



Extra info:

This method of data driven shading was also used in Serpendipity's effects. By taking the "heat" attribute of the fire they were able to shade their fire based on how much heat it is currently generating (this data was generated using Houdini). This creates a more believable shading model since the heat will shift and change as the fire grows and gets hotter.

Here's a link with more information and some of the other uses for Primvars that I found very helpful:

<https://www.youtube.com/watch?v=ZUtN8R4TIV8>