itDD

_Introduction to Techniques in Digital Design

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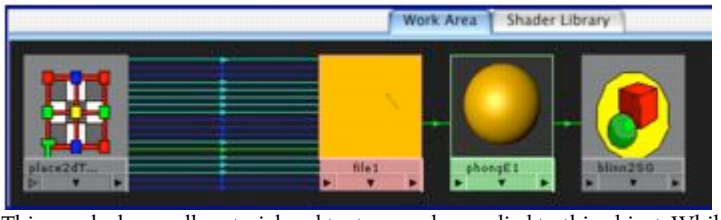
Hypershade Window

After you create a texture node, you will often want to return to the associated material node to make changes. Because material and texture nodes do not have icons that represent them in your scene view, you need a special editor, called **Hypershade**, to select them and edit their attributes.

Using the Hypershade Window:

1. **Hypershade** Window can be found under *Window > Rendering Editors > Hypersahde*
2. At the top of **Hypershade**, click the Materials tab. If the material swatches are too small to see clearly, dolly into the view using the same keyboard and mouse shortcuts you would use in the scene view.
   This tab shows all the materials currently in your scene.
3. With the middle mouse button, drag the newly created material into the scene view and over your object. When you release the mouse, the material appears on the sphere. **Hypershade** is designed for quick, drag-and-drop operations such as this.
4. Select the object.
   From the menus in **Hypershade**, select *Graph > Graph Materials on Selected Objects*.
   A graph appears in the **Work Area** tab in the bottom section.



This graph shows all material and texture nodes applied to this object. While the Materials tab shows a catalog of the materials in the scene, the **Work Area** tab shows whatever material, texture, or other node you are currently working on. The Graph menu has several menu items that change the contents of the Work Area display.
The Work Area shows connection lines between the nodes. The lines have arrows that all point in one direction. For a closer look at these arrows, dolly into the view using the same keyboard and mouse shortcuts you would use in the scene view.

Mental Ray's Reflection and Refraction Blur

Whereas **reflections** are the physical manifestation of light rays bouncing off of an object, **refractions** are the physical manifestation of light rays passing and bending through a transparent object. **Raytraced reflections** and **refractions** are typically rendered perfectly sharp, but in the real world, no perfect mirror or transparency exists. Instead, small-scale impurities reflect or refract light slightly, creating a blurry, glossy look. You can now easily render natural looking blurry **reflections** and **refractions** with mental ray for Maya.

Rendering blurry reflections and refractions:

1. With mental ray selected as the renderer, turn Raytracing on in the Render Settings window and in the Key Lights Shadow Attributes within its Attribute Spreadsheet.
1. Within the Attribute Editor of the selected material open the Raytracing Options pull down menu. If you are going to be utilizing Refractions, check Refractions on.
1. In the mental ray tab of the desired material's Attribute Editor, set the reflection and, or refraction blur attributes.
1. Reflection/Refraction Blur determines the blurriness of the reflection or refraction by calculating the angle (in degrees) between the perfect reflection or refraction direction and the jittered ray direction. A value of 0 creates a perfectly diffuse reflection or refraction. Values of 10 to 30 are good starting points.
1. Reflection/Refraction Blur Limit determines the blurriness of secondary reflections or refractions. The higher the Reflection/Refraction Blur Limit, the more the secondary reflections/refractions are blurred.
1. Reflection/Refraction Rays specifies how many rays to use to sample the random deviation from the perfect specular direction (blurry reflections and refractions require supersampling because a ray's direction is not precisely determined with this feature. It may deviate [randomly] from the perfect specular direction with the bounds specified by Reflection/Refraction Blur).

   In general, more rays are required for more blurry reflections or refractions. Other sampling parameters also affect this setting: per-object samples and the Render Settings sample setting supersample in image space. If you increase any of these two settings, you may be able to reduce the number of rays without loss quality, while significantly improving performance.
   (refer to image T09_rfl_1.tif within the images folder of the tutorial's project)
   (refer to image T09_rfr_1.tif within the images folder of the tutorial's project)
   (refer to image T09_rfr_2.tif within the images folder of the tutorial's project)

Custom Mental Ray Shaders

The material shaders dgs_material and dialectric_material implement different physically based models of reflection and refraction.

Creating a DGS_Material:

1. Within the Hypershade Window, click the drop down menu below the Create Tab. Select Create Mental Ray Nodes.
1. Under the Materials pull down menu of the Create mental ray Node menu, select dgs_material.
1. The dgs_material (Diffuse-Glossy-Specular Material Shader) can simulate mirrors, glossy paint or plastic, anisotropic glossy materials such as brushed metal, diffuse materials such as paper, translucent materials such as frosted glass, and any combination of these.
1. Diffuse is the resultant color of the object
1. Glossy provides the color of the glossy highlights and generates blurred reflections
1. Specular provides the color of mirrored reflections and generates crisp reflections
1. Shiny determines the width of the glossy reflection and the amount of blurred reflections
1. Shiny_u and Shiny_v specifies the width of the glossy reflection in the U and V coordinates of the object independently
1. Transparency specifies transparency (if ior is 1) or refractivity (if ior is not 1).
1. IOR is the index of refraction. Metals typically have a higher index of refraction than glass. Glass typically has an index of refraction set to 1.5.
   (refer to image T09_dgs_1.tif within the images folder of the tutorial's project)

Creating a Dialectric_Material:

1. Within the Hypershade Window, click the drop down menu below the Create Tab. Select Create Mental Ray Nodes.
2. Under the Materials pull down menu of the Create mental ray Node menu, select dgs_material.
3. the dialectric_material shader is a physically based material shader which can be used to simulate dialectric media such as glass, water and other liquids.
4. COL is the "persistence" coefficient which corresponds to the fraction of light which is left after traversing one unit of material. Thus 0.0 means that 10% of the light is absorbed per unit length of the material.
5. IOR is the index of refraction. Glass typically has an index of refraction set to 1.5.
6. Pheong Coefficiant determines the intensity of specular highlights
   (refer to image T09_dia_1.tif within the images folder of the tutorial's project)
   (refer to image T09_dia_2.tif within the images folder of the tutorial's project)