Cycles for Max Manual

Release 2021.1.1 for 3ds Max 2017-2023

June 18, 2022

Contents

Chapter 1

Overview

Cycles for Max is a plugin that brings the capabilities of Blender's Cycles renderer to Autodesk 3ds Max. The plugin integrates with many of Max's built-in features including ActiveShade rendering, Physical Material, OSL Texmaps, exposure control, and more.

As of version 2021.1.1, Cycles for Max is compatible with 3ds Max 2017-2023 and is based on Blender 2.93.

If you are using this plugin for the first time, consider reading through the Quick Start Guide.

A PDF of this manual can be found at https://cyclesformax.net/manual.pdf. Additionally, if you have already installed the plugin, the manual PDF is available in the directory `(3ds Max 20xx)\Plugins\cycles\manual.pdf`.

Chapter 2

Quick Start Guide

2.1 Introduction

This quick start guide is meant as a short introduction to many of the basic features included in this plugin. This will cover creating a simple scene, creating materials, setting up environment lighting, performing a render, and cleaning up noise for a final render.

This guide will assume you have some familiarity with 3ds Max and know how to do some simple operations such as creating objects, creating and applying materials, setting the renderer, and navigating in the viewport.

Continue to Guide

2.2 Guide

2.2.1 Part 1: Scene Setup

For the purposes of this guide, a very simple scene will do. I will be using a teapot sitting on a box. In this image I have set the teapot's segment count to 16 so it looks fairly round.

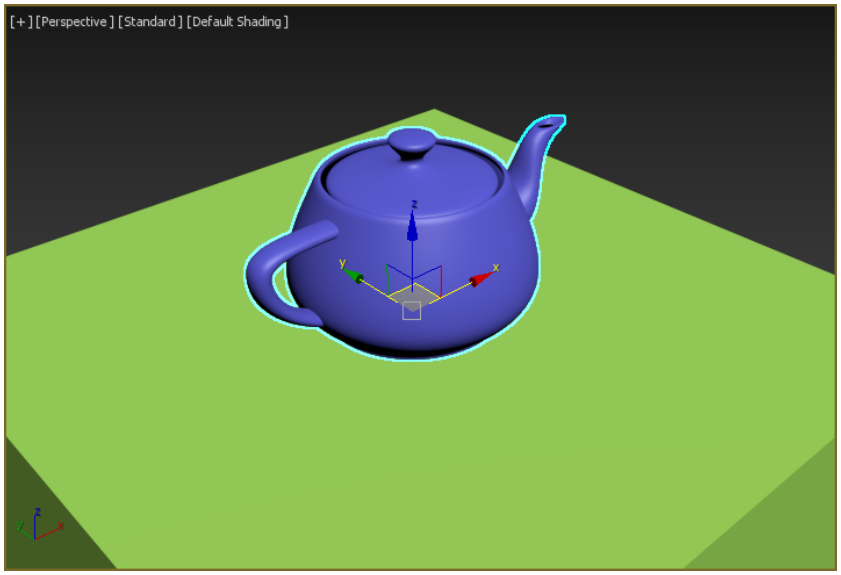

Figure 2.1: A simple scene in the viewport

Now that we have a scene, we need to set up lighting. Trying to render the scene as it currently is would just result in a black frame.

2.2.2 Part 2: Lighting

For this scene, I'll be using an environment map for lighting. The specific map I'm using is the 4k version of Chinese Garden which can be downloaded for free at HDRI Haven, but any HDRI should work just as well.

To bring up our environment setup, press 8 or open the "Rendering" menu and select "Environment...". In the "Environment and Effects" window click the button at the top under the label "Environment Map:". If you haven't set an environment map yet, this button should be labeled "None".

In the texmap list that pops up, select bitmap and then navigate to the HDRI file on your hard drive. Leave all of the HDR settings as default when you load the HDRI file.

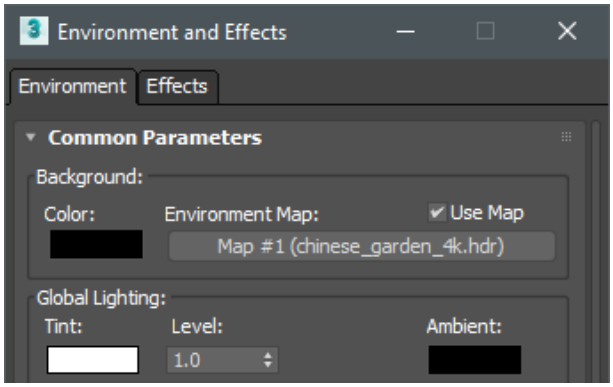

Figure 2.2: The environment map is set in the environment dialog

Now the environment is set up and we can do a test render. First, make sure that your perspective viewport is selected and has a decent view of the scene. Then, press F10 to bring up the render setup dialog. In the "Renderer" dropdown, make sure "Cycles for Max Renderer" is selected. With all the options still at default, you can click Render to produce something that resembles this image.

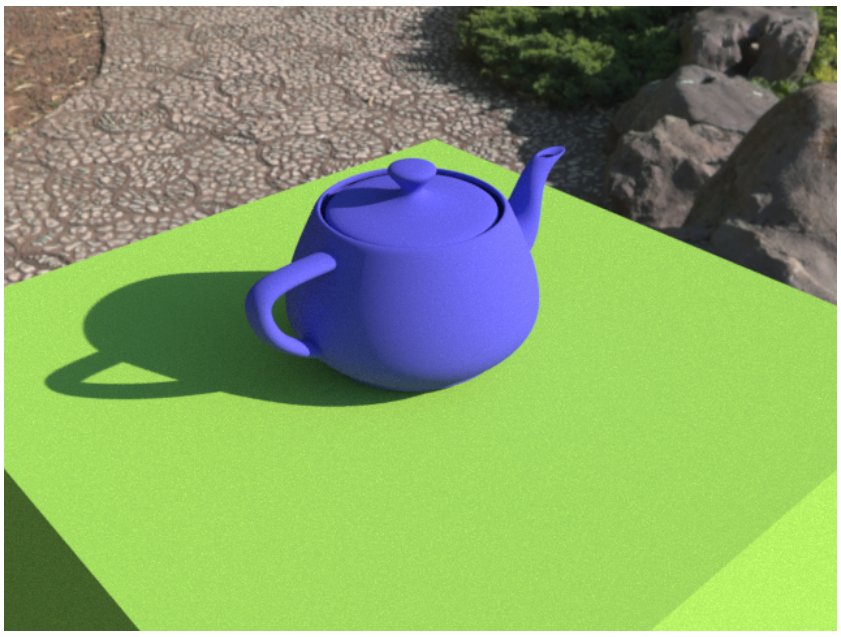

Figure 2.3: The scene rendered with environment lighting

If you would like, you can rotate the environment map by changing the HDRI bitmap's U offset in the 'Coordinates' rollout of the bitmap parameter panel.

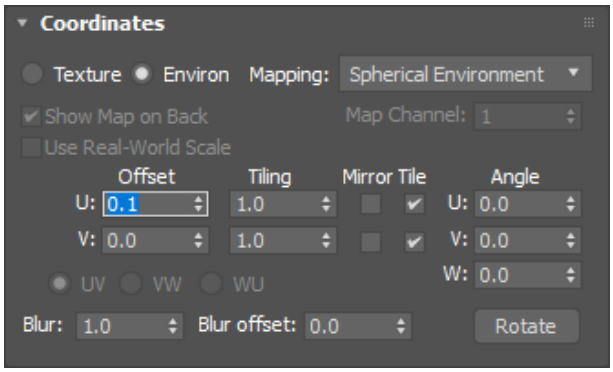

Figure 2.4: Texmap parameters used to rotate the environment

2.2.3 Part 3: Materials

Now that we have some basic lighting set up, we need to give the scene some materials. This simple scene will need just two materials: one for the box and one for the teapot.

Box Material

The simplest general-purpose material available in Cycles is the Diffuse material, so we will use this for the box. Create a Cycles Diffuse material and assign it to the box in your scene.

Next, create a Smoke texmap and connect it to the Color input of your Cycles Diffuse material. We will need to change some of the parameters on this texmap to make it work with Cycles. The two changes we need are to change the Coordinates Source to "Explicit Map Channel" and change the Size to 0.3. These changes are needed because Cycles for Max is only compatible with 2-dimensional Max texmaps, not 3-dimensional maps based on object geometry.

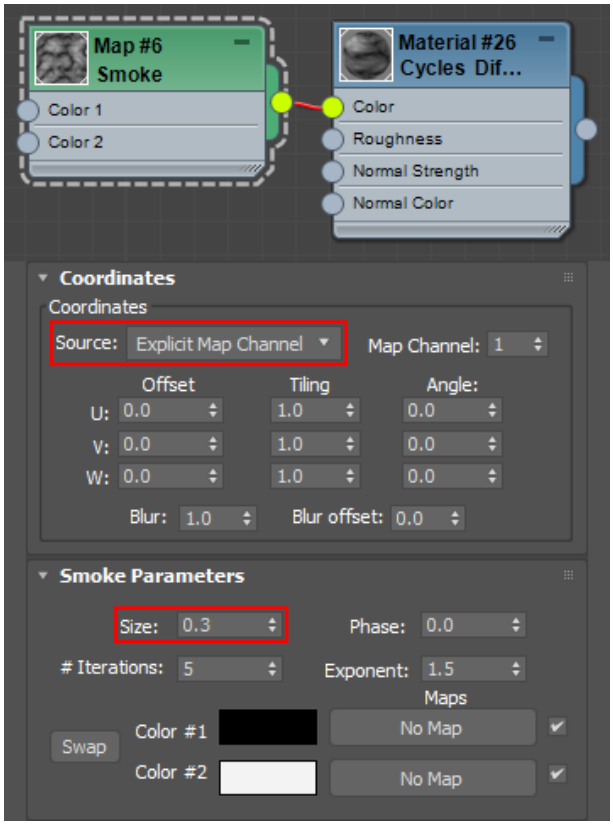

Figure 2.5: Material used for the box

Teapot Material

For the teapot we will use the Physical Material that is built in to 3ds Max. This material is largely compatible with Cycles for Max, though not every parameter is respected. See the Max Materials section for more details.

First, create a Physical Material and apply it to the teapot. Then, in the presets rollout at the top of the Physical Material configuration, open the menu labelled `<Choose Preset....>` and select Copper.

Render

With these materials in place, our render output now looks like this.

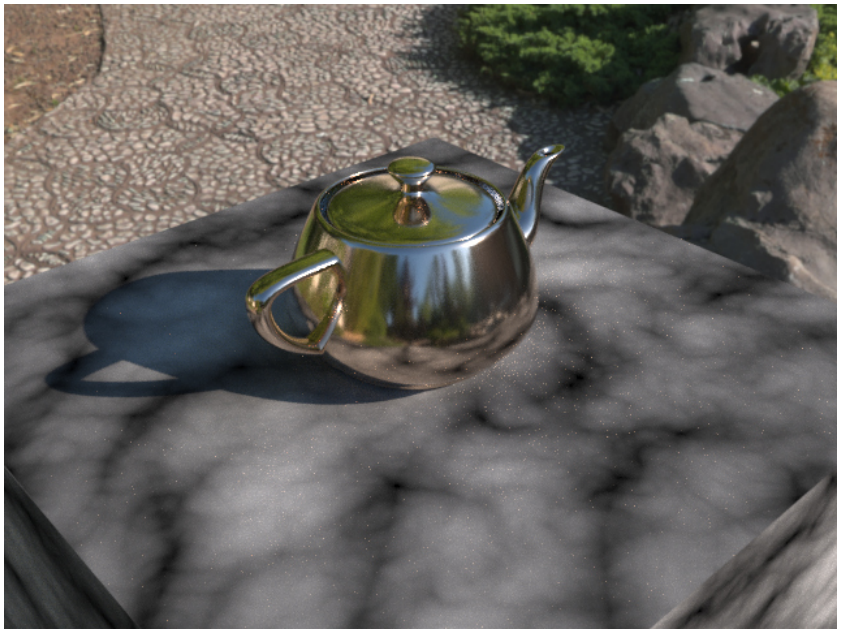

Figure 2.6: The scene rendered with some materials

2.2.4 Part 4: Cleaning Up Noise

Now we have a completed scene, but the render is quite noisy. This noise is most noticeable on the top surface of the cube, particularly around the base of the teapot. This noise is caused by very bright sunlight reflecting off of the side of the teapot onto the cube.

Cycles give us a few options to help reduce this noise.

First, we can always simply render more samples. By default this plugin will render 100 samples per pixel, which is fine for previews and simple scenes, but will not provide the quality we want for final renders. To help reduce the noise in this scene, let's increase the sample count from 100 to 200. This is done in the Cycles tab of the Render Setup Dialog. Be aware that increasing the sample count will proportionally increase the render time. That is, 200 samples will take twice as long to render as 100 samples.

Another tool available to help clean up noise is sample clamping. This allows us to set a maximum possible brightness for any one sample. Limiting the maximum brightness in this way will reduce the variance across multiple samples of the same pixel and will lead to a final render with less noise.

It is important to understand that the sample clamp option gives you speed at the expense of physical accuracy. This option limits how bright a single pixel can be sampled, which means that enabling it makes the scene slightly darker than it 'should' be. Be careful when using these options, particularly direct clamping, to not remove too much light from the scene.

In this case we know that the noise is being caused by light reflected off of the teapot. This is Indirect light because it is bouncing off of an object in the scene, so we will want to adjust Clamp Indirect here. Lower it to 2.4.

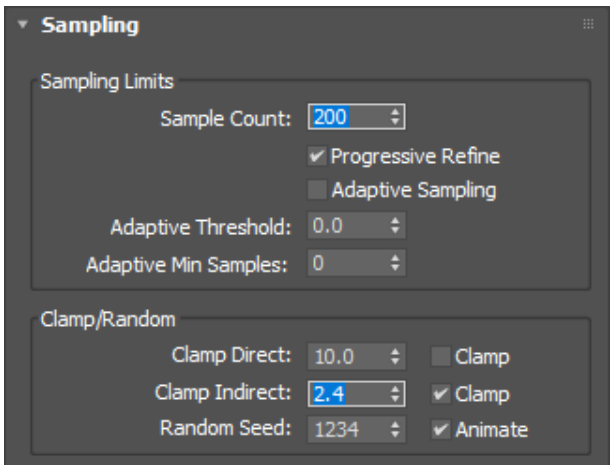

Figure 2.7: The render parameters to control clamping

With these options set, let's run the render again.

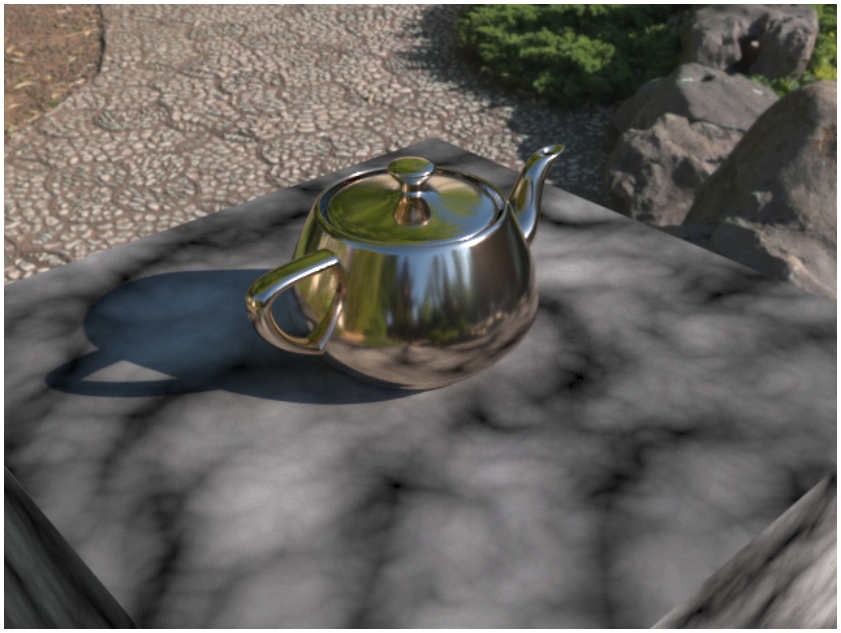

Figure 2.8: The scene rendered with less noise

Here we can see that a lot of the noise from the initial render is gone, but the image is not perfectly clean yet. The quality can be further increased by raising the sample count or lowering the indirect clamp a bit more. Try playing around with the render settings to see what values reduce the noise in this scene to an acceptable level.

2.2.5 Part 5: Where to go Next

Now you have a basic understanding of how this plugin works and how to set up a scene, lighting, and materials.

From here you may want to check out my youtube channel, which has a number of videos covering how to use various specific features of this plugin.

There is not (yet) a lot of info about using this plugin specifically, so you may also want to look up some tutorials on how to use Cycles with Blender. Most information from such tutorials will apply to this plugin just as much as it does to Blender. The Shader Graph Editor in particular should make it very easy to follow tutorials for building Cycles shaders.

Chapter 3

Render Setup Dialog

3.1 Overview

The Render Setup dialog is where you can configure most render options. These options are split into two tabs. The Cycles tab contains the most important and frequently-used options for controlling your render. The Advanced tab contains options that are less-frequently used.

The Render Setup dialog can be opened by pressing F10.

3.2 Cycles Tab

3.2.1 Misc Rollout

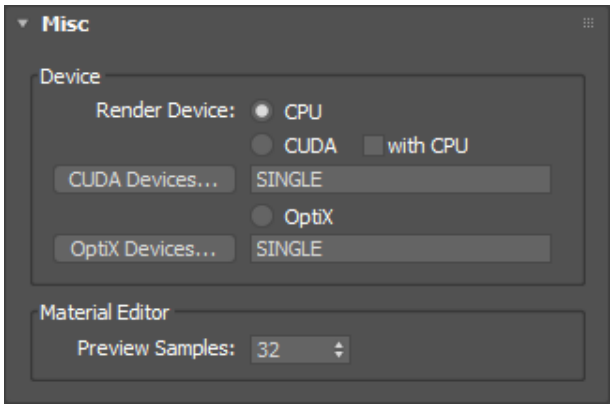

Figure 3.1: Miscelaneous render parameters

Render Device Controls whether the render will be done with the CPU, CUDA, or OptiX(RTX).

With CPU If this box is checked the CPU will be used in addition to the GPU for CUDA renders.

Render Device Text Boxes Selects which GPU(s) will perform the render (CUDA/OptiX only). The "Devices..." button will display a list of available devices to choose from.

These text boxes also allow some special keywords to be used in place of device IDs. These are `SINGLE`, which will use the first device in the list, and `ALL`, which will use every device.

Preview Samples The number of samples to render for material previews. Previews are the spheres that appear in the material editor.

3.2.2 Sampling Rollout

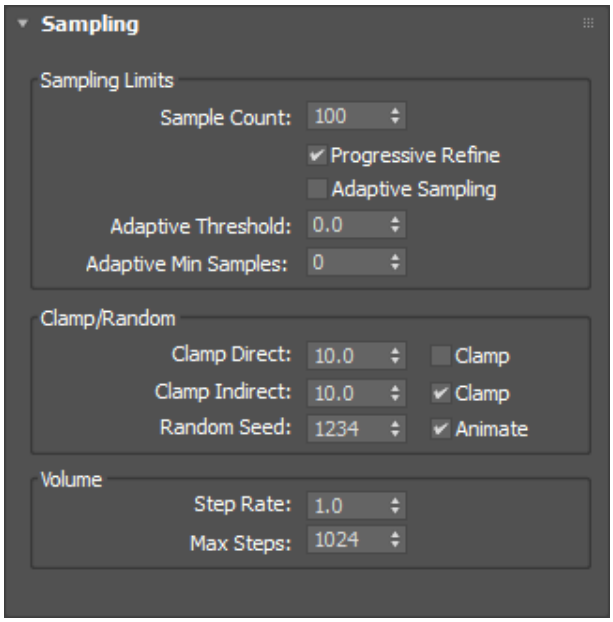

Figure 3.2: Sampling render parameters

Sample Count The number of samples per pixel to render. A higher value will produce an image with less noise, but will take longer to render. This option is the primary way you will control the speed/quality trade-off for your render.

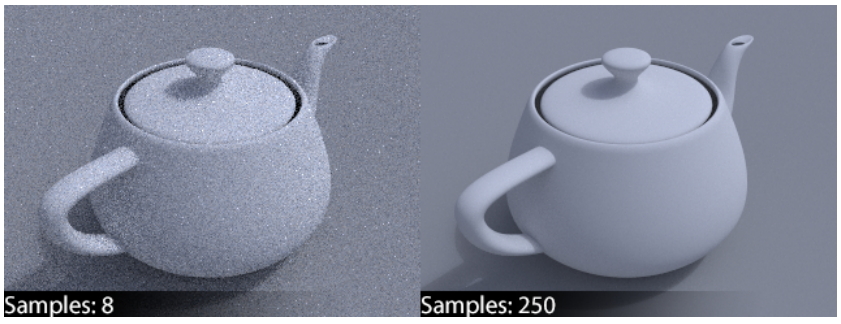

Figure 3.3: Example demonstrating different sample counts

Progressive Refine When this option is enabled the renderer will sample each pixel once before moving on to the next sample. When it is disabled, the renderer will sample each tile to completion before moving to the next tile.

Enabling this option is good for previews as it will let you see a noisy but complete image very quickly after starting a render. Disabling this option will result in slightly faster renders.

Adaptive Sampling When enabled, Cycles will render a variable number of samples per pixel. This option can potentially save a lot of rendering time. This option works fastest with progressive refine disabled.

Adaptive Threshold Noise threshold at which to stop sampling a given pixel when adaptive sampling is enabled. Lower values will cause more samples to be rendered. Set to 0.0 to use a default values based on your overall Sample Count.

Adaptive Min Samples The minimum number of samples to render for any pixel in an adaptive render. If set to 0, a default value of the square root of Sample Count will be used.

Clamping

Clamp Direct Direct sample clamp. This sets a maximum intensity that may be sampled for the first bounce of a ray.

Clamp Indirect Indirect sample clamp. This sets a maximum intensity that may be sampled for bounces of a ray after the first bounce.

Random Seed Sets the seed used to randomize noise patterns.

Animate Random Seed When this option is selected, the random seed will automatically change every frame. Enabling this helps to avoid having distractingly similar noise patterns in consecutive frames of an animation.

Volume

Step Rate Inverse of distance between sampled points in a volume shader. Higher values will be more accurate and take longer to render.

Max Steps Maximum number of steps to sample in a volume before terminating.

3.2.3 Film Rollout

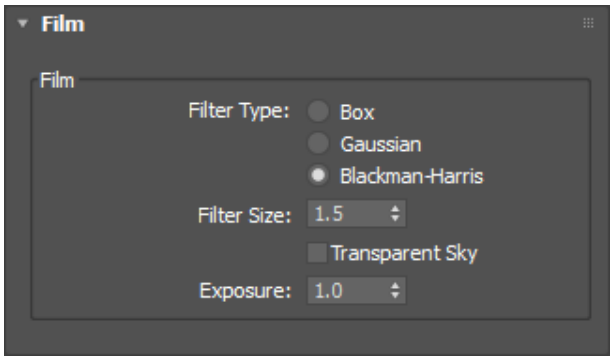

Figure 3.4: Film render parameters

Filter Type The type of reconstruction filter to use for this render.

Filter Size Size of the filter in pixels. Larger numbers will produce a blurrier render. This option does not apply to the Box filter.

Transparent Sky When this option is enabled the alpha channel will be used to store transparency information for the render and the sky will be black. By default the sky is considered transparent and all geometry is opaque.

Exposure Exposure multiplier. This can be used to linearly brighten/darken the final render output. This exposure multiplier will be applied before the exposure control.

3.2.4 Translation Rollout

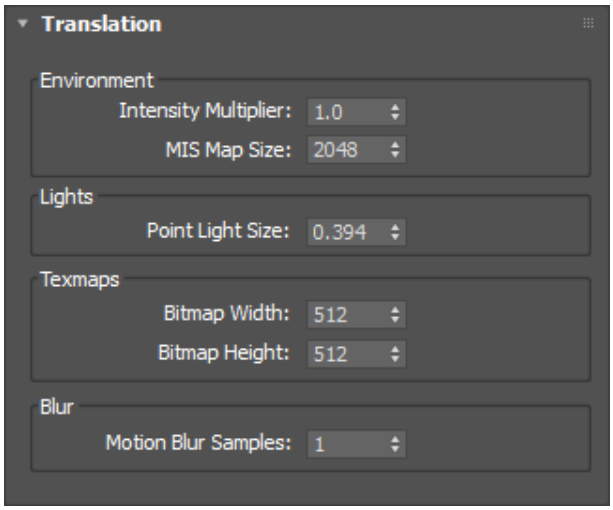

Figure 3.5: Translation render parameters

Environment

Intensity Multiplier Brightness multiplier for the environment map.

MIS Map Size Sets the size of the MIS map to be used for the environment. Larger values will cause the scene to render with less noise from environment light at the expense of memory usage and speed.

Lights

Point Light Size Point lights will be translated as spherical lights with this diameter.

Texmaps

Bitmap Width Sets the default width of baked texmaps.

Bitmap Height Sets the default height of baked texmaps.

Blur

Motion Blur Samples Sets the number of samples to be used for deform-based motion blur. Note that the option does not affect object-transform-based blur or camera-transform-based blur.

3.3 Advanced Tab

3.3.1 Performance Rollout

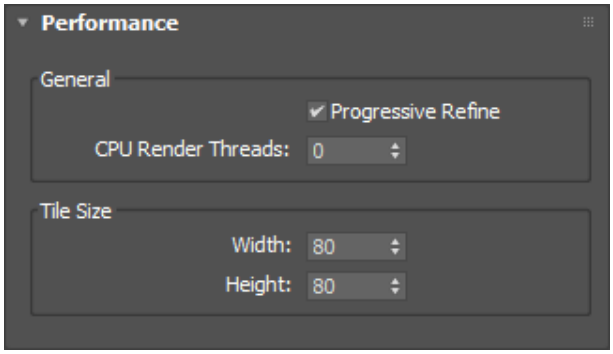

Figure 3.6: Performance render parameters

General

CPU Render Threads Sets the number of threads to use for CPU renders. A value of 0 will automatically use one thread per logical core.

Tile Size

Width Tile width for all renders.

Height Tile height for all renders.

3.3.2 Light Path Rollout

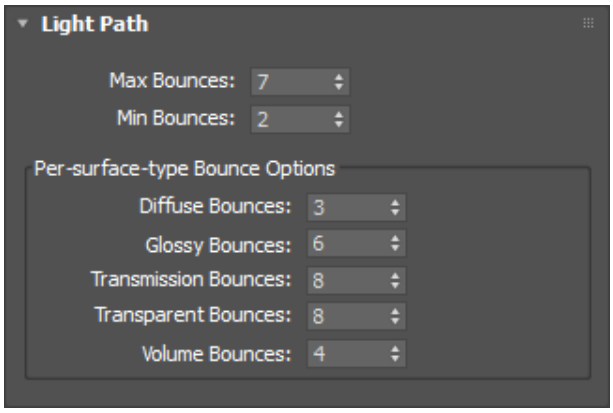

Figure 3.7: Light path render parameters

Max Bounces Maximum number of light bounces.

Min Bounces Minimum number of light bounces.

Per-surface-type Bounce Options

Diffuse Bounces Sets the maximum number of times a ray may bounce on diffuse surfaces.

Glossy Bounces Sets the maximum number of times a ray may bounce on glossy surfaces.

Transmission Bounces Sets the maximum number of times a ray may bounce through transmission surfaces.

Transparent Bounces Sets the maximum number of times a ray may bounce through transparent surfaces.

Volume Bounces Sets the maximum number of times a ray may bounce through volume boundaries.

3.3.3 Render Passes Rollout

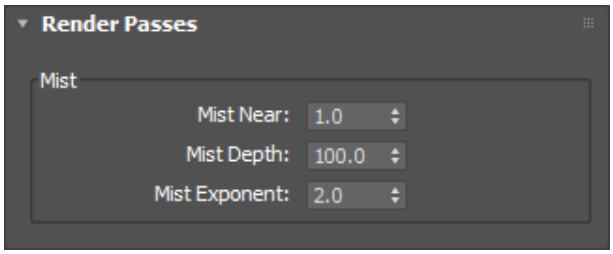

Figure 3.8: Render pass parameters

Mist

Mist Near Distance from the camera where mist will first become visible.

Mist Depth Length over which mist will accumulate.

Mist Exponent Exponent to be applied to all mist values. With an exponent of 1.0, the mist value will increase linearly from distance `Mist Near` to distance `Mist Near + Mist Depth`.

3.3.4 Stereoscopy Rollout

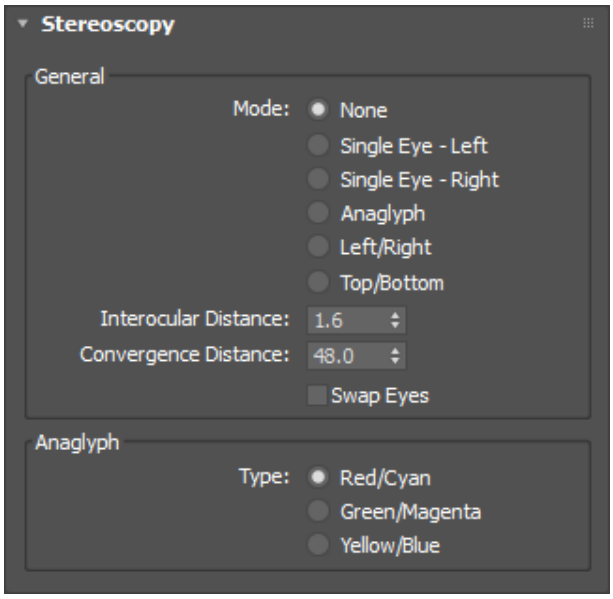

Figure 3.9: Stereoscopy render parameters

General

Mode Select the stereoscopic rendering mode.

Note: For Left/Right or Top/Bottom stereoscopic renders, you will need to modify the render resolution for the output to have the correct vertical field of view. Left/Right renders will require double the horizontal resolution and Top/Bottom renders will need double the vertical resolution.

For example, if you have set up your scene to render correctly without stereoscopy at 1280x720, you would need to use a resolution of 2560x720 for a Left/Right stereo render and 1280x1440 for a Top/Bottom stereo render.

Interocular Distance Distance between the two camera positions used for stereoscopic rendering.

Convergence Distance Distance at which the direction vectors of the two stereo cameras will intersect.

Swap Eyes Swap the position of the left/right stereo cameras.

Anaglyph

Type Select the color channels that will be used for the left and right eye.

Chapter 4

Cameras

4.1 Camera Types

4.1.1 Physical Camera

Max's Physical Camera is the best general-purpose camera type to use with Cycles for perspective renders. This plugin supports many features of the Physical Camera including depth-of-field and motion blur.

4.1.2 Targeted and Free Camera

Both the targeted and free camera in Max are fully supported by this plugin. Either of these is the best type to use when doing an orthographic render. These camera types will also work well for perspective renders if you don't need any of the Physical Camera's advanced features.

4.1.3 Cycles Panoramic Camera

This plugin includes a special camera for panoramic renders. See the Panoramic Camera section for more details.

4.2 Panoramic

After installing this plugin, a camera type named "Cy Pano Cam" will be available in the "Cycles" category. This camera is used to set up panoramic

renders that are not possible with the normal Max cameras.

4.2.1 Configuration

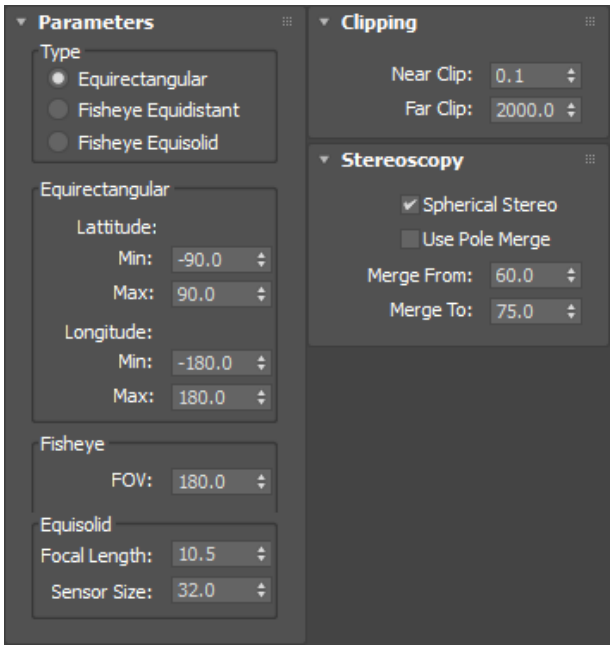

Figure 4.1: Panoramic camera parameters

Parameters

Type The type of panoramic projection to use.

Equirectangular Lattitude Sets the vertical field of view for the panoramic camera. Negative values are below the horizon and positive values are above it. Only applies if the type is Equirectangular.

Equirectangular Longitude Sets the horizontal field of view for the panoramic camera. Negative values are left of the camera and positive values are right. Only applies if the type is Equirectangular.

Fisheye FOV Sets the FOV to use. Only applies if the type is Fisheye Equidistant or Fisheye Equisolid.

Equisolid Fisheye Focal Length Sets camera focal length. Only applies if the type is Fisheye Equisolid.

Equisolid Fisheye Sensor Size Sets camera sensor size. Only applies if the type is Fisheye Equisolid.

Clipping

Near Clip Distance from the camera to the near clipping plane.

Far Clip Distance from the camera to the far clipping plane.

Stereoscopy

Stereoscopy options will only apply when you also select a stereoscopy mode other than "None" in the advanced render options.

Spherical Stereo When enabled, the render will be performed in such a way that the output can be used in VR and similar setups. If you are doing a stereoscopic panorama render, you almost certainly want this to be enabled.

Use Pole Merge When enabled, the stereo effect will be reduced at the poles of the panoramic render (straight up and straight down). Visual artifacts may appear at the poles if this is not enabled.

Merge From Angle where pole merging will begin. The stereo effect will be gradually reduced beyond this angle.

Merge To Angle where pole merging will end. The stereo effect will cease entirely beyond this angle.

Note: For the above angle measurements 0 degrees means level with the camera and 90 degrees means straight up or down relative to the camera.

Chapter 5

Materials

5.1 Overview

5.1.1 3ds Max Materials

Most materials that are included with 3ds Max will not work with this plugin. The only compatible materials are Multi/Sub-Object and Physical Material (with some limitations). See the Max Materials section for more details.

5.1.2 Cycles Shader Graph

In addition to the above materials that attempt to integrate with a normal 3ds Max workflow, this plugin also lets you build shader graphs with the full flexibility offered by Cycles. This method will give you the most control over your materials, but it requires a good understanding of Cycles shader nodes. See the Shader Graph Materials section for more details.

5.1.3 Cycles Materials

This plugin includes several material types that allow you to use native cycles shader types with the slate material editor or compact material editor. Use of these materials is discouraged. See the Cycles Materials section for more details.

5.2 Max Materials

This page details which Max material types are supported by the Cycles for Max plugin.

5.2.1 Multi/Sub-Object

This plugin fully supports the Multi/Sub-Object material.

5.2.2 Physical Material

Max's Physical Material is partially supported by this plugin. Cycles for Max uses an approximation of the Physical Material and does not support all Physical Material parameters. Options that are crossed out in the below image are not supported.

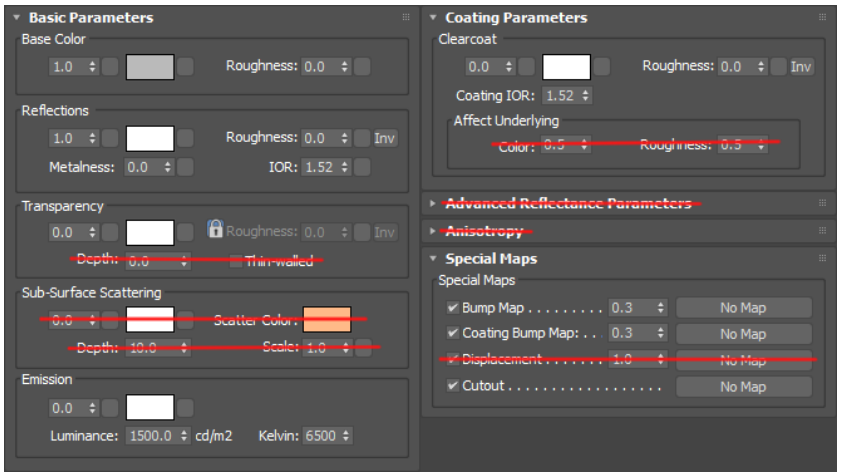

Figure 5.1: Supported Physical Material parameters

5.2.3 All Others

All built-in Max materials not listed on this page are incompatible with Cycles for Max.

5.3 Shader Graph Materials

Shader graph materials allow you to use the full power of Cycles shaders. This plugin includes three materials that allow you to directly manipulate the Cycles shader graph, each having a different number of texmap slots.

- Cycles Shader Graph - 08
- Cycles Shader Graph - 16
- Cycles Shader Graph - 32

All of these materials share the same configuration rollout.

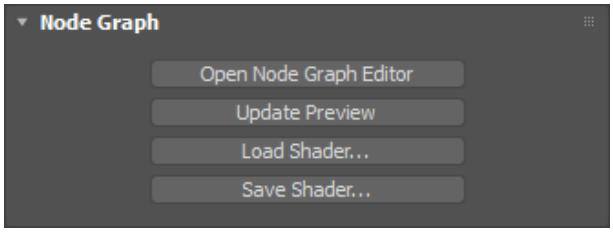

Figure 5.2: Shader graph configuration rollout

Open Node Graph Editor Opens the Shader Graph Editor.

Update Preview Forces Max to re-render the material preview.

Load Shader... Loads the shader from a file.

Note: Loading a shader creates a copy of that shader, not a reference to the file.

Save Shader... Saves the shader to a file.

Note: Like loading, saving will save a copy of the current shader to disk. Any changes made after saving will be not stored in the saved file.

5.4 Cycles Materials

These materials are included with this plugin for completeness, but should be avoided when possible. For most use cases you should use either the Max Physical Material for simplicity or a Cycles Shader Graph for control. These materials land somwhere in between those two options and can be awkward to use.

5.4.1 Basic Cycles Materials

This plugin provides a Max material for each native Cycles shader type. These materials are:

- Cycles Add
- Cycles Anisotropic
- Cycles Diffuse
- Cycles Emission
- Cycles Glass
- Cycles Glossy
- Cycles Hair
- Cycles Holdout
- Cycles Mix
- Cycles Principled BSDF
- Cycles Refraction
- Cycles Subsurface Scattering
- Cycles Toon
- Cycles Translucent
- Cycles Transparent

- Cycles Velvet
- Cycles Volume Absorption
- Cycles Volume Add
- Cycles Volume Mix
- Cycles Volume Scatter

Information about how to configure these shaders can be found in the Blender manual.

Add and Mix Materials

Add and Mix materials are split into two categories: surface and volume. One surface and one volume shaders cannot both be an input to the same Add/Mix node.

Combining a surface and volume into a single shader can be done with the Cycles Shader Material described below.

5.4.2 Normal Maps

Several of the basic Cycles materials support normal maps. Any Cycles material that supports normal mapping will have this parameter rollout.

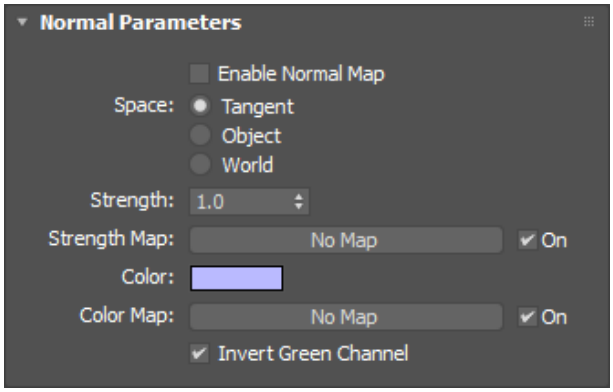

Figure 5.3: Normal map parameters

Enable Normal Map The normal map will only be rendered when this is enabled.

Space Specifies the coordinate space to use for the normal map.

Strength Sets the strength of the normal map effect. Higher values will cause the normal map to be more visible.

Color The RGB color used to represent the normal vector. Your normal map should be plugged in to this slot.

Invert Green Channel Inverts the green (Y) channel of the normal map. This option may need to be enabled depending on the software used to generate your normal map.

Note: Normal maps made using Max's scanline renderer require this box to be checked.

5.4.3 Cycles Shader Material

Not to be confused with the Cycles Shader Graph Material, the Cycles Shader material allows you to combine a surface shader with a volume shader as well as set shader-level parameters.

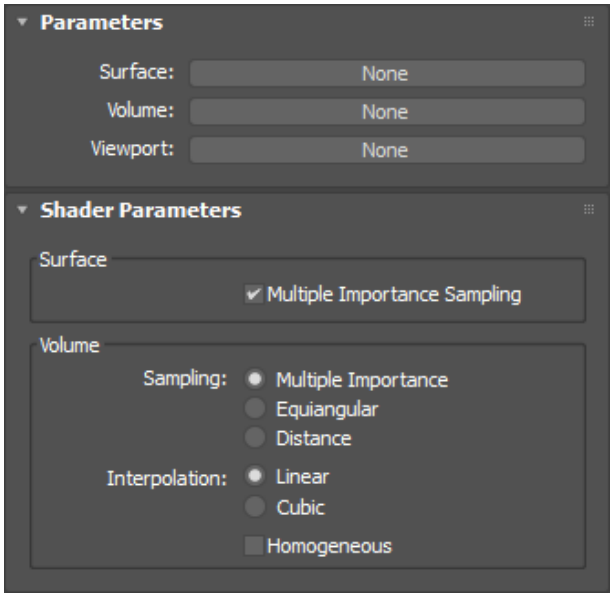

Figure 5.4: Shader material parameters

5.4.4 Viewport Slot

A number of Cycles materials have a slot named Viewport that takes a material as its input. This slot can be used to override how the material is displayed in the 3ds Max viewport. Whatever material is plugged into the viewport slot will be rendered in the viewport.

The viewport slot has no impact on the output of the renderer. It only affects how a material appears in the Max viewport.

This slot can be useful to cover for the fact that most Cycles materials do not have a viewport preview available. You can create a rough approximation of your material with the Physical Material and then assign it to the viewport slot.

Chapter 6

Texmaps

6.1 Overview

6.1.1 3ds Max Texmaps

3ds Max Texmaps can be used with Cycles through texture baking.

Texture baking for built-in texmaps currently only supports purely 2-dimensional textures. Most built-in texmaps can be used in a 2-dimensional mode by setting either their coordinate source or coordinate mapping to "Explicit Map Channel".

6.1.2 Cycles Bitmap Filter

Cycles Bitmap Filter is a texmap type included with this plugin that can be used to change texture baking settings per-texmap. This texmap should be used as pictured below, placed between the texmap you would like to alter and the corresponding material.

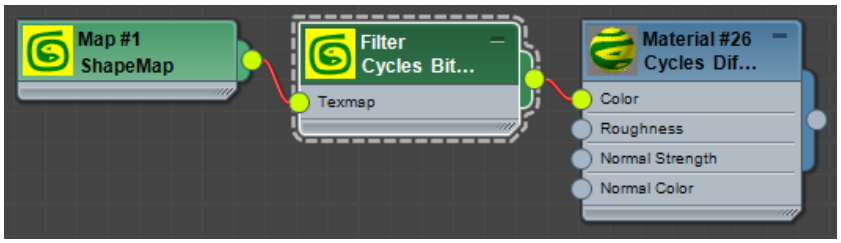

Figure 6.1: Cycles Bitmap Filter usage

Parameters

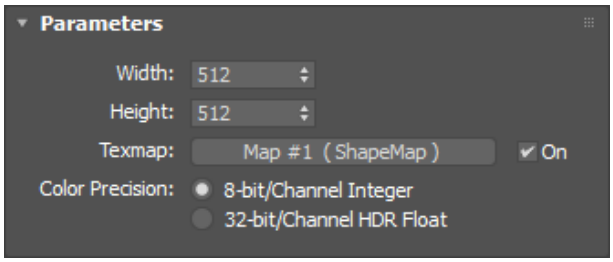

Figure 6.2: Cycles Bitmap Filter parameters

Width Width, in pixels, at which to bake the texmap.

Height Height, in pixels, at which to bake the texmap.

Texmap Texmap to bake.

Color Precision Choose whether to bake the texmap as a standard 8 bit/channel texture or an HDR texture.

6.1.3 Cycles Environment

Cycles Environment is a texmap that can be used to configure the scene's environment map. Details are available on the environment page.

6.2 Baking

Baking is the process of sampling a Max texmap to produce an ordinary 2d texture. All texmaps used in a scene will automatically be baked when a render begins.

Baking support is currently limited to purely 2-dimensional texmaps. Any texmaps that depend on object geometry or camera position will not bake correctly.

6.2.1 Resolution Detection

When baking a texture, the plugin will attempt to automatically detect an appropriate baking resolution based on the resolution of included bitmaps. The texture will be baked at a resolution of (largest width of any sub bitmap) * (largest height of any sub bitmap).

If your texmap is purely procedural and contains no bitmaps, the resolution set in the render setup dialog will be used instead.

The baking resolution can be optionally overridden per-texmap using the Cycles Bitmap Filter texmap.

6.3 Environment

6.3.1 Bitmap

Bitmap-based environment maps are supported by this plugin, including HDR bitmaps.

6.3.2 Physical Sun and Sky

Max 2017's Physical Sun and Sky is fully supported. By default it will be baked as an HDR image with a resolution of 3200x1600.

6.3.3 Cycles Environment

Cycles Environment is an environment map type included in this plugin. This map allows you to set two different environment maps to be used in your scene: one for lighting and the other for the background.

Additionally, the background map can be set to wrap around the whole scene or be a static backplate.

This map is functionally very similar to Mental Ray's Environment/Background Switcher.

Parameters

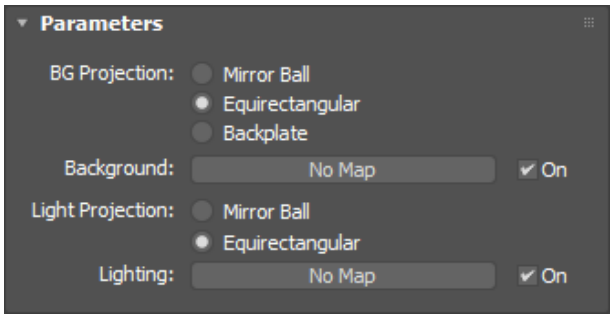

Figure 6.3: Cycles Environment parameters

Texmap Slots

Background The texture to be used as the background.

Lighting The texture to be used for lighting.

Projection Types

Mirror Ball Projection used for environment maps in a mirror ball format.

Equirectangular Projection used for environment maps in an equirectangular format. This is the default option and is the projection type most commonly used by environment maps.

Backplate Projection used for a static background image that does not change with camera angle and FOV.

Chapter 7

Lights

7.1 3ds Max Lights

This plugin supports a number of standard 3ds Max lights including point lights, directional lights, and spot lights. Be aware that, due to the fact that Cycles is a physically-based renderer, these lights may behave differently in Cycles compared to Mental Ray or the scanline renderer.

Note: Most built-in 3ds Max lights have shadows disabled by default. You will probably want to enable shadows.

7.1.1 Directional Lights

Directional lights in Cycles do not support size or shape, only direction. Every directional light will apply to your entire scene regardless of its size and position.

7.2 Emissive Geometry

Any mesh in your scene with a Cycles Emission material will produce light.

The Physical Material also supports emission.

7.3 Environment

The environment can be an important source of light for your scene.

Chapter 8

Render Passes

Cycles render passes can be added to your render in the Render Elements tab of the Render Setup dialog. For information about what the different render passes do, consult the official Cycles documentation.

The Mist pass has a few configurable parameters that can be changed in the Render Passes rollout of the Advanced Tab.

8.1 Cryptomatte

This plugin fully supports rendering Cryptomatte passes based on object name, asset name, and/or material name. To generate these passes, simply add the matching Render Elements to your scene.

Consider the following render element setup:

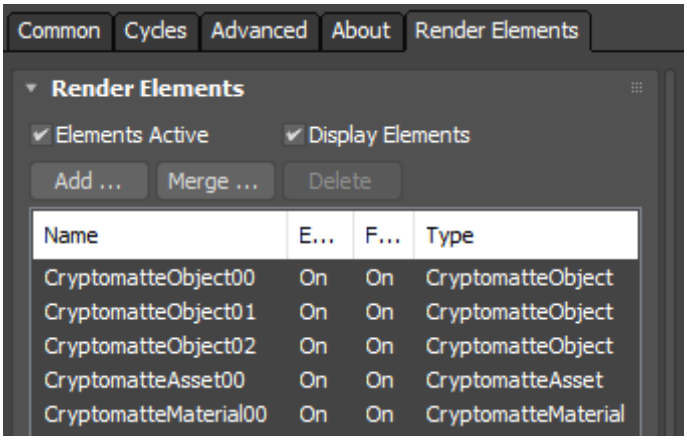

Figure 8.1: Example Cryptomatte configuration

Here there are three Cryptomatte layers based on object name, one based on asset name, and one based on material name.

The number of layers determines how many separate objects (or assets or materials) can be part of a single pixel. One layer will allow for up to two objects, two layers will allow four objects, three layers will allow six objects, etc.

The order of render elements here is very important. The first (from the top) Cryptomatte layer of each type will be layer "00", the next will be "01", and so on. Please note that the render element names and files names do not impact which layer is treated as "00" and which as "01", that is solely determined by the order of the render element list.

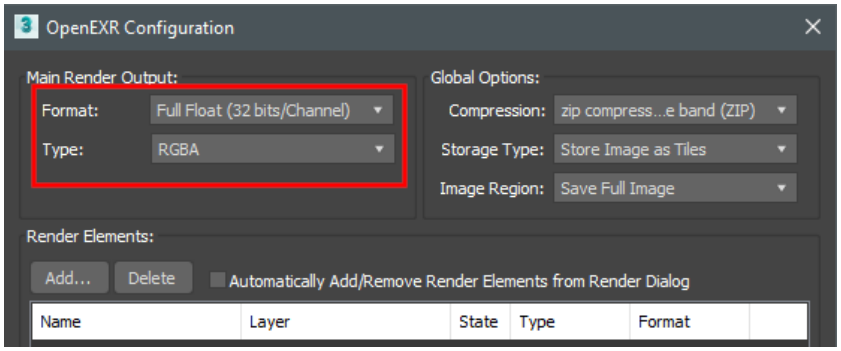

Figure 8.2: OpenEXR configuration

Cryptomatte layers can only be saved in a very specific format. The data in these layers will be destroyed unless it is saved in a format which supports 32-bit/channel HDR images. Of all the image formats that Max can save as without a plugin, EXR is the only format suitable for saving cryptomatte layers. Make sure that the EXR is set to use "Full Float 32 bits/channel" instead of the default "Half Float 16 bits/channel" and have the type set to "RGBA".

Chapter 9

Cycles Properties Modifier

Cycles for Max includes a modifier named "Cycles Properties". This modifier is used to apply Cycles-specific object-level properties to an object in your scene.

9.1 Configuration

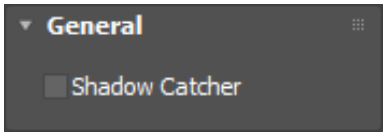

Figure 9.1: Cycles Properties parameters

9.2 Parameters

Shadow Catcher When enabled, this object will be treated as a shadow catcher. A shadow catcher will not be visible, but shadows cast onto that object will be visible.

Chapter 10

Shader Graph Editor

The Shader Graph Editor gives you full control over how Cycles renders your shader. Its interface should be somewhat familiar to anyone who has used the shader graph editor in Blender.

The Shader Graph Editor can be accessed through the Cycles Shader Graph materials.

Source code for the shader editor is available under the GPLv2+ license on GitHub.

10.1 Interface

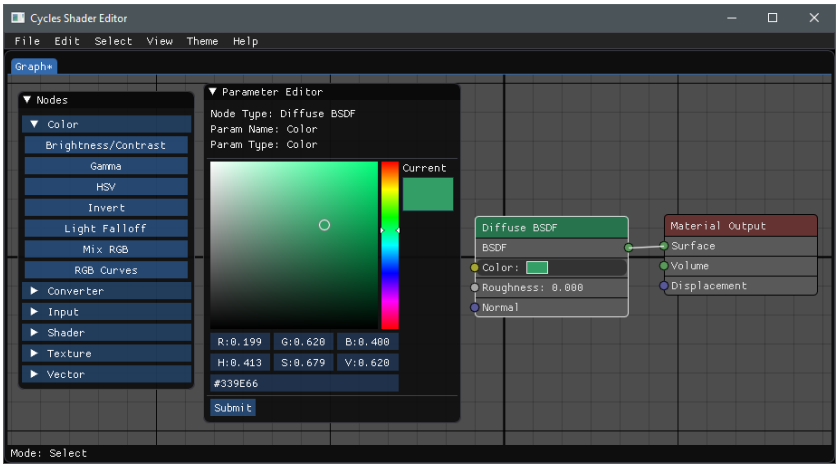

Figure 10.1: Shader Graph Editor interface

10.1.1 Menu Bar

File - Save to Max Saves the current shader to your 3ds max material. You must save the shader before it can be rendered.

File - Save to file... Saves the current shader to a file than can easily be shared with other users.

File - Load from file... Load a file from the disk into this shader editor. Note that you must "Save to Max" after loading this way for the shader to be used.

Edit - Undo/Redo Undo or redo recent changes to your graph.

Edit - Duplicate Make a copy of all selected nodes and their connections.

Select - ... Change the current selection of nodes.

View - Focus Selection Centers the view on the currently selected nodes.

View - Focus Output Centers the view on the single Output node.

Theme - ... Change the color scheme of the editor.

10.1.2 Windows

Create Node Window Used to add new nodes to the shader graph. Click a category name to expand that category and view the available nodes. Click a node type to select, then click on any open space to create a new node of the selected type.

Parameter Editor Window This window is only visible when you have selected some parameter of a node. Here you can edit that parameter's value. This window will have a different appearance based on the type of the selected parameter.

10.2 Usage

Create Nodes Click a node type in the node selection window, then click empty space to create a node of that type.

Move Nodes Click and drag a node in the viewport to move the node.

Select Nodes Click to select a single node. `ctrl + click` to add to your existing selection. `shift + click` to toggle selection of a node. Box selection is also available.

Create Connections Click and drag from a node's output socket to begin making a connection. Release the mouse button over another node's input socket to complete the connection.

Change/Remove Connections Click and drag from a node's connected input socket to begin rerouting the connection. Release the mouse button over empty space to delete the connection.

Pan the Viewport Middle click and drag with your mouse to pan the viewport around. The arrow keys can also be used to pan the viewport.

Undo/Redo Use `ctrl + z` and `ctrl + y` to undo or redo.

Save Save the current graph to Max with `ctrl + s`.

Delete Delete selected nodes with the `delete` key.

Chapter 11

Blender Shader Exporter

This plugin includes a Blender addon that can be used to export Cycles shaders directly from Blender.

Note: The exporter is only supported with Blender 2.83 through 2.93. It may work on other versions but has not been tested.

11.1 Installation

To install the plugin, check the box for "Blender Shader Exporter" during installation. This will copy the addon file into your Blender install directory.

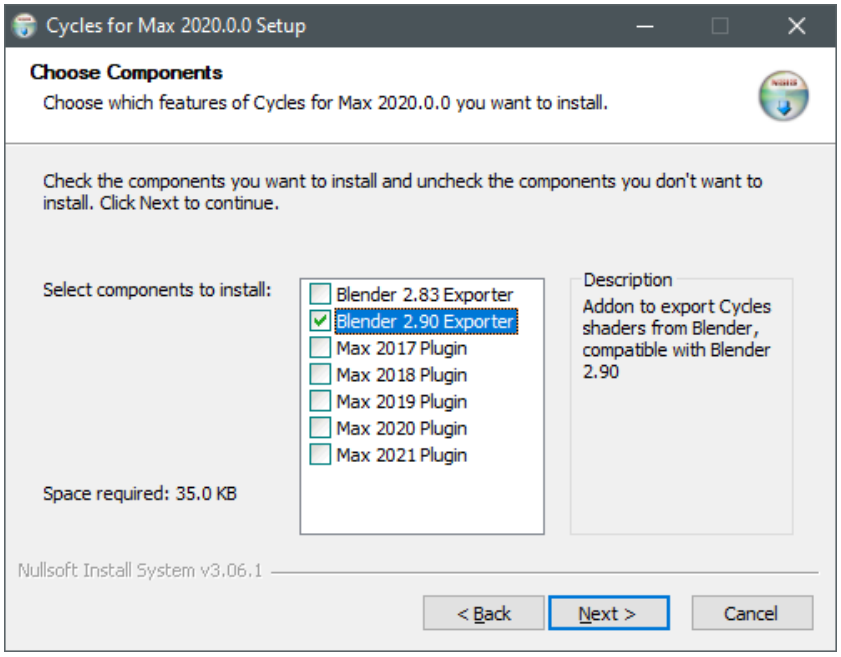

Figure 11.1: Installing the shader exporter

After the addon has been installed, you will need to enable it in Blender. To do this, open the File menu and select 'User Preferences...', then go to the 'Add-ons' tab. In the Add-ons tab, click the checkbox to enable `Export for Cycles for Max shader`. You can type 'max' in the search box to make this entry easier to find in the list.

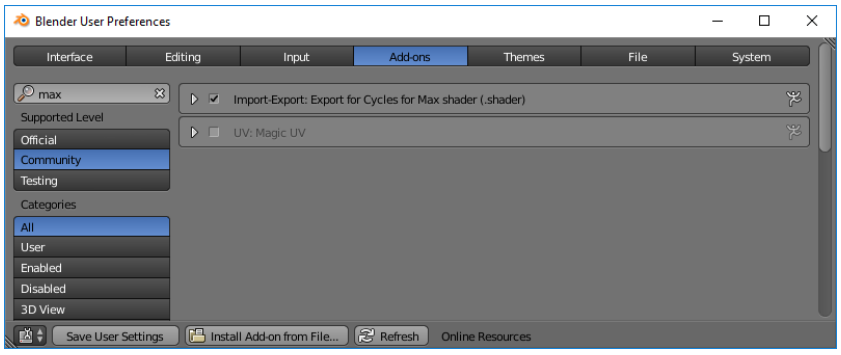

Figure 11.2: Enabling the shader exporter

11.1.1 Manual Installation

If the installer is unable to find Blender on your computer, it will ask you where the addon should be installed. In this case, it will copy a file named `io_cyclesmax_shader.py` to the destination you select. You will need to copy this file to `(Blender Directory)\(version)\scripts\addons\`. For a default install of Blender 2.93, this will be `C:\Program Files\Blender Foundation\Blender 2.93\2.93\scripts\addons\`.

11.2 Exporting a Shader

With the addon enabled, you can now export a shader. Select an object with the shader you would like to export, then go to `File -> Export -> Cycles for Max Shader (.shader)`. This shader file can then be loaded into a Cycles Shader Graph material in Max.

Note that this addon currently supports most cycles shader nodes, but not all of them. If the exporter finds a type of node it does not support then a warning will be displayed. The shader will still export ignoring all nodes of unsupported types.

A video demonstrating this process is available on youtube here.

Chapter 12

MAXScript

12.1 Render Parameters

All render parameters described here can be configured through MAXScript as well as through the Render Setup dialog.

This plugin creates a global MAXScript object named cyclesRender. This object has one member variable per configurable parameter. A complete list of these variables is:

12.1.1 Misc

- cyclesRender.renderDevice
- cyclesRender.cudaDevice
- cyclesRender.cudaWithCPU
- cyclesRender.optixDevice
- cyclesRender.previewSamples

12.1.2 Sampling

- cyclesRender.samples
- cyclesRender.sampleClampDirect
- cyclesRender.useClampDirect

- cyclesRender.sampleClampIndirect
- cyclesRender.useClampIndirect
- cyclesRender.randSeed
- cyclesRender.sampleVolStepSize
- cyclesRender.sampleVolMaxSteps

12.1.3 Translation

- cyclesRender.skyIntensity
- cyclesRender.misMapSize
- cyclesRender.pointLightSize
- cyclesRender.texmapBakeWidth
- cyclesRender.texmapBakeHeight
- cyclesRender.deformBlurSamples

12.1.4 Film

- cyclesRender.filmTransparentSky
- cyclesRender.filmExposure

12.1.5 Performance

- cyclesRender.renderThreads
- cyclesRender.tileWidth
- cyclesRender.tileHeight
- cyclesRender.useProgressiveRefine

12.1.6 Light Path

- cyclesRender.lightpathMaxBounce
- cyclesRender.lightpathMinBounce
- cyclesRender.lightpathMaxDiffuseBounce
- cyclesRender.lightpathMaxGlossyBounce
- cyclesRender.lightpathMaxTransmissionBounce
- cyclesRender.lightpathMaxTransparentBounce
- cyclesRender.lightpathMaxVolumeBounce

12.1.7 Render Passes

- cyclesRender.passMistNear
- cyclesRender.passMistDepth
- cyclesRender.passMistExponent

12.1.8 Stereoscopy

- cyclesRender.stereoMode
- cyclesRender.stereoInterocularDistance
- cyclesRender.stereoConvergenceDistance
- cyclesRender.stereoSwapEyes
- cyclesRender.stereoAnaglyphMode

Chapter 13

Debug Mode

This plugin contains an optional debug mode that will create log files every time you perform a render with Cycles for Max. These log files can be used to help track down the source of bugs inside the plugin. Debug mode will only log data to local files on your computer and will never send any of that data anywhere through the internet.

Debug mode will cause your render to run slower as well as fill up your disk with large log files. This mode should always be disabled unless you need the log files for some specific reason.

13.1 Log File Location

All log files are stored in the top level of your Windows user directory in a directory name 'CyclesMaxLog'. This will be a path that looks like `C:\Users\YOU\CyclesMaxLog\`. This directory contains no important data and can be deleted at any time.

13.2 Enabling Debug Mode

After installing the plugin, there will be two .reg files in the `Plugins\cycles\reg` directory inside of your 3ds Max installation. Double-click `debug_enable.reg`. You will need to restart Max after enabling this registry setting for the change to take effect.

When debug mode is active, you will see an extra tab named 'Debug' in the Render Setup dialog.

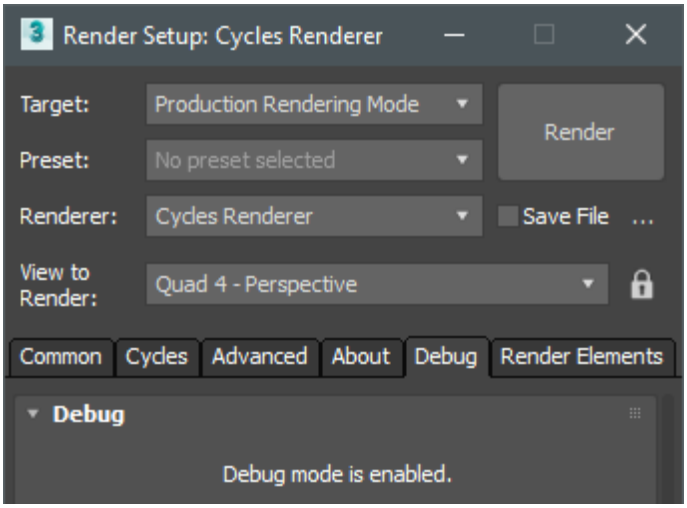

Figure 13.1: Debug Mode Active

13.3 Disabling Debug Mode

In the directory described above, double-click `debug_disable.reg`. You will need to restart Max after disabling this registry setting for the change to take effect.

Chapter 14

Breaking Changes

This section of the manual will document changes in the plugin that may require user attention to resolve.

14.1 Beta 3.00

14.1.1 Roughness

Prior to version Beta 3.00, the roughness value of all materials (excluding the Principled BSDF and Autodesk Physical Material) was interpreted differently than it is now. In the old system, the roughness value of a shader was used directly for roughness computations, but in new versions this value is squared first to be more consistent with other 3d software.

This means that if you had a material set up to work correctly with older versions of this plugin, you will need to increase the roughness value so it looks the same in newer versions. To find the new roughness value that should be used, you can simply take the square root of the old value.

As an example, a roughness of 0.25 in versions prior to Beta 3.00 is equivalent to a roughness of 0.5 in Beta 3.00 and later and a roughness of 0.01 in the old versions is equivalent to a roughness of 0.1 now.

Chapter 15

Known Issues

This page documents known problems with this plugin as of version 2020.0

15.1 High Priority

High priority issues are issues that I plan to fix in the next plugin release. These are problems that impact common workflows within this plugin.

- There are currently no known high priority issues.

15.2 Low Priority

Low priority issues are issues that impact uncommon workflows or have some workaround available. These are problems I plan to fix eventually, but not as a priority.

If some issue listed here is significantly impacting your ability to use this plugin, please get in contact with me and we can discuss moving it up to high priority.

- Backplates do not work in anaglyphic stereoscopic renders.
  - Workaround: Render your scene in a non-anaglyph stereo mode and combine the two images using image or video editing software.
- Render passes do not work in left/right or top/bottom stereoscopic renders.

  - Workaround: Render your scene using each "Single Eye" stereoscopy option separately, then combine the two images afterwards.

- Motion blur does not work in panoramic renders.

15.3 Working as Intended

These issues may appear to be a problem, but are working as intended.

- Render passes do not work in anaglyphic stereoscopic renders.
  - Due to the way color channels are split up in anaglyphic stereo renders, there is no reasonable way to make render passes work. If you need some data from render passes for a stereo render, you must use a non-anaglyph stereoscopy mode.