



Visualization in the Raytracer Renderer (ART)

Handout

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The Autodesk Raytracer Renderer (ART) is a fast, physically based renderer that is available for a number of Autodesk applications, including 3ds Max software, Revit software, and Inventor software. This 3ds Max software-based course is designed to show you how to get the most out of this exciting new renderer. The course will cover ART renderer workflow, as well as how to set up scenes for maximum speed and quality. This includes sections on physical materials, physical sun and sky, as well as image-based lighting workflows.

Setting Up the Renderer

One of the biggest features about Autodesk Raytracer is that it is very easy to set up. ART is what is termed as an “unbiased” renderer. This means it is physically accurate and works great out of the box. “Biased” renderers such as Mental Ray require more controls as a way to adjust the image towards (or away) from reality. Because ART is unbiased, it needs far fewer controls than most renderers.

Render Quality

Controls quality - just like it says. More quality = more render time.

Stop Rendering (time)

You also have the option to stop the render after a specific time. Be careful with this feature when animating, as it could cause scene quality to also animate, creating unwanted artifacts.

Rendering Method

Two options. Fast path tracing is faster and good for most scenes. Advanced Path Tracing is slower and for scenes with lots of light interaction (glass, water, reflections). Test with Fast Path and only upgrade to Advanced when needed.

Filtering

Basically a smart blur control that removes render artifacts at the expense of image crispness. Balancing this against Render Quality can speed render times and maintain image integrity.



Anti-Aliasing

Edge quality. Higher number create blurry edges, lower numbers create jaggy edges. Sweet spot is usually near the default (3.0)

Working with Lights

Since ART is an unbiased renderer, it works best with real-world lighting setups. It is usually best to use photometric lights and sun/sky systems to light your scenes. Image-based lighting can also be introduced to your scenes for additional realism and effects.

Basic Lights

As mentioned, the Photometric lights should be used for standard lighting in ART. These lights usually demand that camera exposure control is used.

Controlling Shadows

As with most renderers, we can control shadow-generation using light or object-based methods. Since it is physically-based, shadow blurriness is best controlled by light position.

Sun Positioner

A new feature to 3ds Max 2017 is the Sun Positioner and this integrates well with ART.

Image Based Lighting

ART also can use images as light sources. Physical materials have an "Emission" parameter that can turn any surface into a light. This can be used to create solid lights, such as neon tubes. It can also be used with bitmaps to create image-based lighting for environmental effects.



Setting Up Materials

Materials have changed a lot with ART. 3DS Max's Standard material is being replaced by the more capable Physical Material. This material is meant as an all-purpose material with enough features that it can be used with multiple renderers, reducing the need to rebuild materials if the renderer changes. This section will show the basics of how to create ART-Friendly materials.

Basic Physical Material Parameters

The Physical Material has a number of parameters that cover most rendering situations. These include everything from basic color to advanced features such as clearcoat and subsurface scattering.

Physical Material Presets

Autodesk includes a library of preset materials. These can be great by themselves, but they also are good starting points for creating your own materials.

Authoring Materials

Materials can be created using either the Slate Material editor or the Standard Material Editor. The Slate Material editor is more robust, but sometimes the original method can be faster.

Converting Scenes

The Scene Converter is a great way to migrate older scenes and libraries to the ART renderer. The converter does a lot of the heavy lifting, but it does need to be managed in order to get the best results.

Conclusion

The ART renderer is a very easy to use and accurate renderer. Careful attention to setting up scenes will make for fast and easy visualization for all types of scenes.