

# 2.3.0

## Release Date

April 9, 2018

This version uses the [Arnold 5.1.0.0](#) core.

On Windows, C4DtoA 2.0 and later require the [Visual Studio 2015](#) redistributable.

### Download links

- [Solid Angle Downloads](#)

### FEATURES

- **Toon shader:** a non-photorealistic rendering (NPR) solution is provided as the combination of the *contour* filter and toon shader. The contour filter draws contour lines using the information provided by the toon shader and it works even for reflected or refracted objects. The toon shader can be used to obtain a cell animation look. A variety of interesting effects can be achieved by, for example, changing the line width using the Edge width scale parameter, connecting a procedural texture to Mask color, or using stylized highlights.
- **Adaptive sampling:** Arnold now has the capability of adapting the sampling rate of each pixel when the Enable adaptive sampling render option is enabled, allowing it to dedicate a greater number of camera samples (and thus also a greater amount of render time) to the pixels that show a greater variation in their sample values. When used, all pixels will receive a sampling rate of at least Camera (AA) samples, but no more than AA samples max. The adaptive sampler's sensitivity to noise may be controlled through the Adaptive threshold render option, where lower threshold values will apply higher sampling rates to a greater number of pixels.
- **Denoiser (OptiX):** the fast, GPU-powered *Nvidia OptiX* AI denoiser is now available in Arnold. The denoiser can be applied to any outputs. As a limitation, it does not work with multi-channel images. *Note that the denoiser is not available on OSX.*
- **Denoiser (noise):** a stand-alone, post-process denoiser executable called *Noice* is now bundled with Arnold. This is a high-quality denoiser that takes into account multiple frames and multiple light AOVs.
- **Alembic procedural:** a procedural node called alembic which is capable of reading *Alembic .abc* files has been added, available through the Arnold Procedural object.
- **Operators:** operators are a new node type which perform per-object (node) parameter assignments and overrides, including late-bindings and deferred overrides on procedurally generated nodes. Operators can also create nodes and carry out general scene inspection and modifications. Operators can be chained together in a graph which is evaluated from a given target operator. Some operators provide a selection parameter which determines, using a wildcard expression, what nodes are processed by the operator. A series of operator nodes are now available: *materialx*, *set\_parameter*, *disable*, *collection*, *switch\_operator*, and *set\_transform*.
- **Procedural overrides:** a new section is added to the *Arnold Procedural* object, called *Parameter Overrides*, which allows users to override any parameters (e.g. shaders of individual polymeshes) of the Arnold nodes created by the procedural.
- **New AOV write RGBA shader:** the *aov\_write\_rgba* shader has been added which complements the existing RGB, float and int variations of this shader.
- **Structured statistics:** render statistics can now be output to JSON files at the end of each render pass, either appended to or overwriting an existing .json file. This is much easier for tools to inspect rather than attempt to parse out the raw-text statistics in the logs that were meant for human consumption.
- **Better time statistics:** additional timing statistics, organized by both nodes and categories, will now be output. This makes it possible to know which objects are most expensive to render and what parts of the renderer took the most amount of time. Detailed information about rendering performance can be output to a file in JSON format, such as "my\_profile.json", and then visualized in Google's Chrome web browser "<chrome://tracing/>".
- **Progressive refinement (EXPERIMENTAL):** a new rendering mode that completes a render call in multiple passes has been added to the IPR window. When enabled the noise progressively converges towards the result at the final AA sample settings. Note that, in its current unoptimized state, the final passes can take very long to filter at high AA samples. This will be addressed in a future update.

### ENHANCEMENTS

- **Matte shader opacity:** the matte shader has gained an *opacity* parameter, so it can honor transparency the same way the built-in matte object parameter does.
- **Per-light group shadow mattes:** The *shadow\_matte* shader has a new *Light group* parameter that when enabled makes the shader sensitive only to lights with a matching AOV setting.
- **Trace sets in ambient occlusion shader:** the *ambient\_occlusion* shader now supports the *Trace set* parameter to specify which objects are included or excluded.
- **Extra samples in standard hair shader:** the *standard\_hair* shader now supports the *Extra samples* parameter to use additional GI samples on a per-shader basis.
- **New wrap mode in image shader:** similar to the preexisting black wrap mode, there is now a *missing* wrap mode where lookups to the image shader that are outside the texture will use the *Missing texture color*.

- ID AOVs in [standard\\_surface](#) and [standard\\_hair](#): the `standard_surface` and `standard_hair` shaders now support ID AOVs. These are useful for creating mattes.
- Face mode option in [color\\_jitter shader](#): with the new `face` mode option, color can be randomized per quadrangle as well as a triangle.
- Normal parameter in [passthrough shader](#): the `passthrough` shader now has a `Normal` parameter that allows for the assignment of a normal or bump map that affects the entire network of shaders it is connected to.
- [Use \\$AOV token in the driver path](#)
- Support for custom volume [material previews](#)
- Warn the user when changing licensing environment variables
- Remove the *Install Node-locked license* dialog

## FIXES

- UDIM textures do not render when *Use existing .tx textures* is on

## NOTES

- The *Optix denoiser* is only compatible with a Nvidia driver version of at least [390](#) installed.
- The *Optix denoiser* is not available on OSX.

## API

- There are modifications in the C4DtoA API which require third-parties to recompile their C4DtoA extensions.