

Image Tool

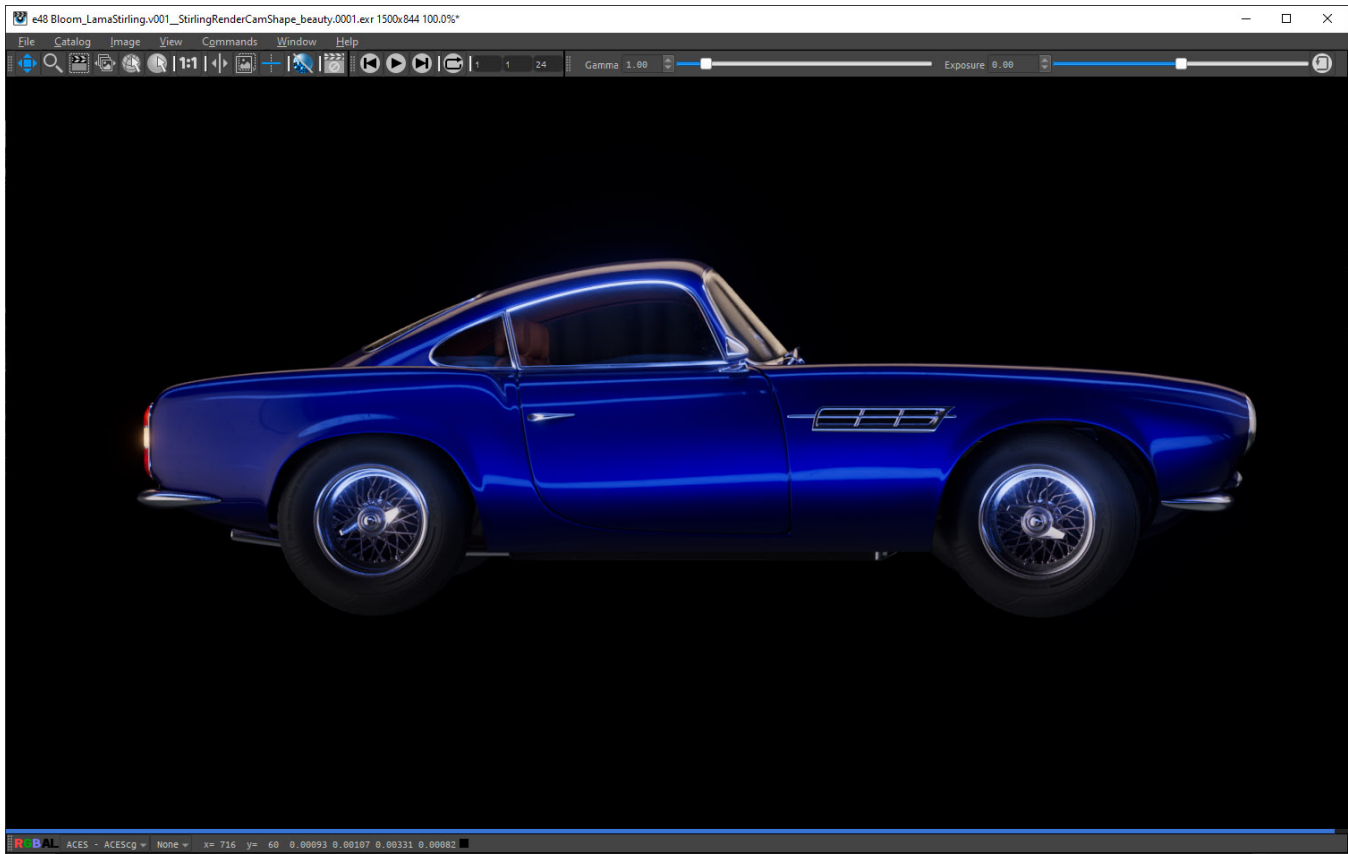
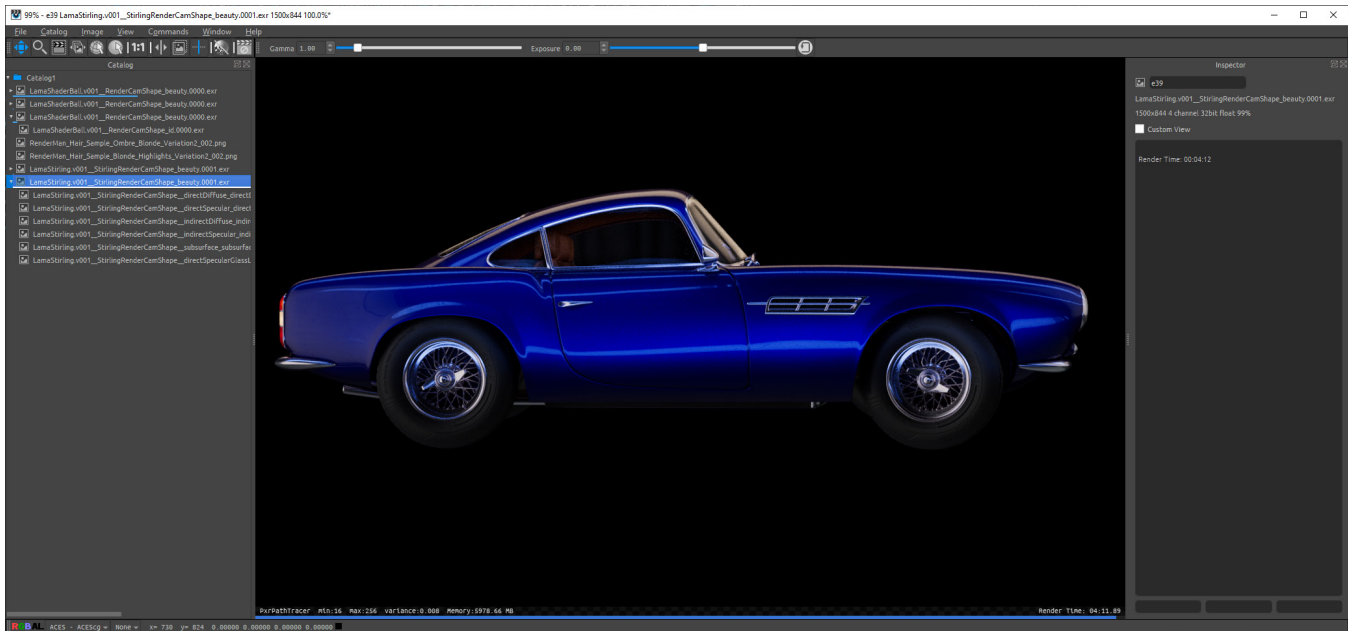


Image Tool ("it") is a robust framebuffer/render view window, offering complete floating point support and a powerful and flexible catalog, as well as a fast and powerful imaging tool that is capable of production-quality image manipulation and compositing usually found only in high-end standalone products.

- User Interface
 - Catalog
 - Image Window
 - Inspector
 - Tools
 - Sequence Controls
 - Monitor Controls
 - Pixel Readout
 - Other
- Preferences Window
 - General
 - Appearance
 - Events
 - Display Mapping
 - Shortcuts
- Special "it" Features
 - AI Denoise
 - Snapshot
 - Views
 - HUD
 - Recent Bucket Markers
 - Background
 - Remapping
 - Sequences
 - Color chart generator
 - Analysis Tools
 - Diff
 - Find Variance
 - Heat Map
 - Palette
 - Custom Display Range
 - Text

- Isolate Values
- Dump Metadata to message log

User Interface



The "it" window can be customized by selecting options in the first two sections on the "Window" menu. These optional windows and toolbars can be shown or hidden from the menu or toggled on or off with their associated hotkey as displayed in the menu. They can also be docked into the main window or left as floating windows. Double-clicking on the title bar of one of these sub-windows will toggle it from docked to undocked. Toolbars, such as the "Pixel Readout" toolbar, don't have a title area since they are so small and instead have a grab handle at the end or top that is used to place them. The grab handle can also be double-clicked to toggle the docking.



For screens with a high DPI you may find the text is hard to read. You can change this manually. Look for the file here:

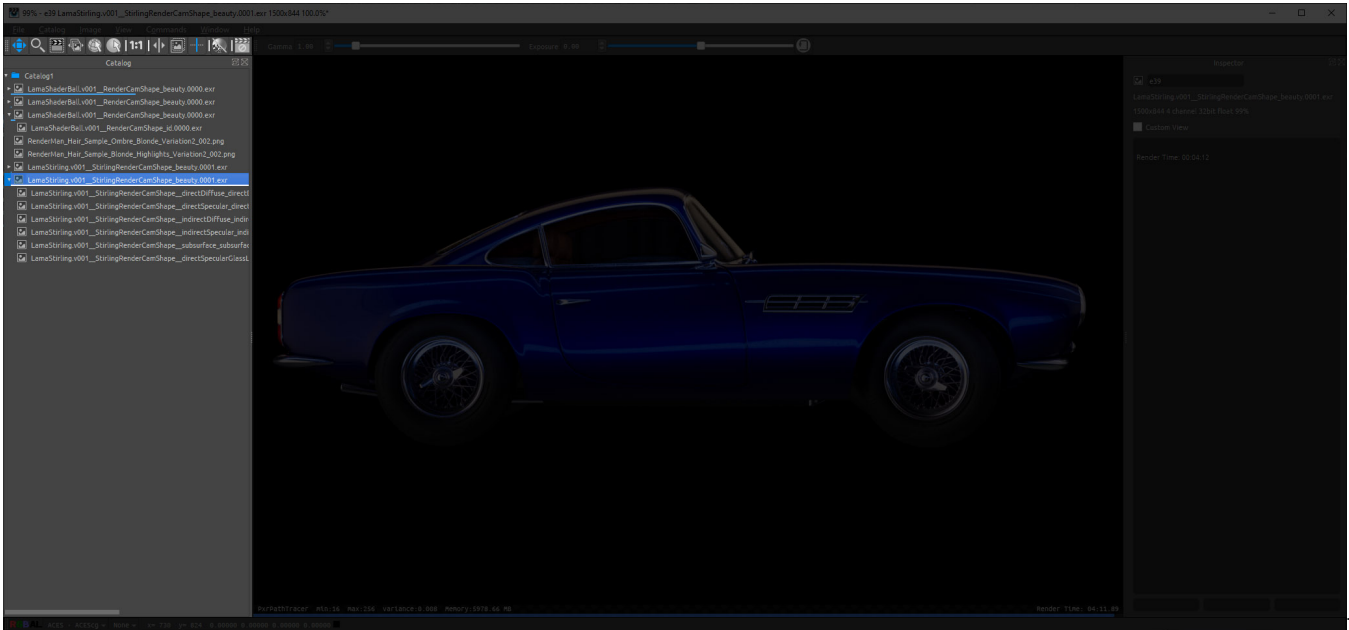
`$RMANTREE/lib/Resources/stylesheets/it.qss`

This acts like a Cascading Style Sheet for "it". You can alter the text size using this section:

```
QLabel#PixelReadout {
    font-family: Courier;
    font-size: 20px;
    margin-left: 10;
}
```

Since we don't recommend altering shipped files, you may put a copy of your new .qss file in your custom directory defined by the environment variable: `RMS_SCRIPT_PATHS`

Catalog



This window shows all the images and renders that are stored in the current "it" session. Multiple catalogs can be used, each storing its own images. To create a new catalog, go to **File->New Catalog**.

Image Window



This window shows the current image or render selected from the catalog.

Inspector



The Inspector window shows information related to the selected image or render. The large text area is the Notes field. This allows you to add any metadata to the image. The Custom View option is explained later in the [Views](#) section, under [Special "it" Features](#) section.

Tools



The tools section gives you access to the most commonly used tools in "it". From left to right, they are:

Pan Tool

Click and hold down the left mouse button on the image window will allow you to pan around the image. (Default hotkey: **1**)

Zoom Tool

Click and hold down the left mouse button on the image window will allow you to zoom in and out of the image. (Default hotkey: **2**)

Crop Tool

Allows you to draw a crop window over your image. This allows you to re-render a portion of your image. To remove the crop window, left-click within the crop window and click on the X in the top right corner. (Default hotkey: **3**)

Scrub Tool

Allows you to quickly scrub through all your images in your catalog. Click and holding down the left mouse button while moving the mouse to the left will scrub backward in the catalog; moving right will scrub forward. (Default hotkey: **5**)

Select Object Tool

Will select the object in your content creation application (may not work in all bridge products). (Default hotkey: **6**)

Select Surface Tool

Will select the shader for the object in your content creation application (may not work in all bridge products). Note that the render must include a Float id AOV to work correctly. Some IPR renders output this from the DCC application. (Default hotkey: **7**)

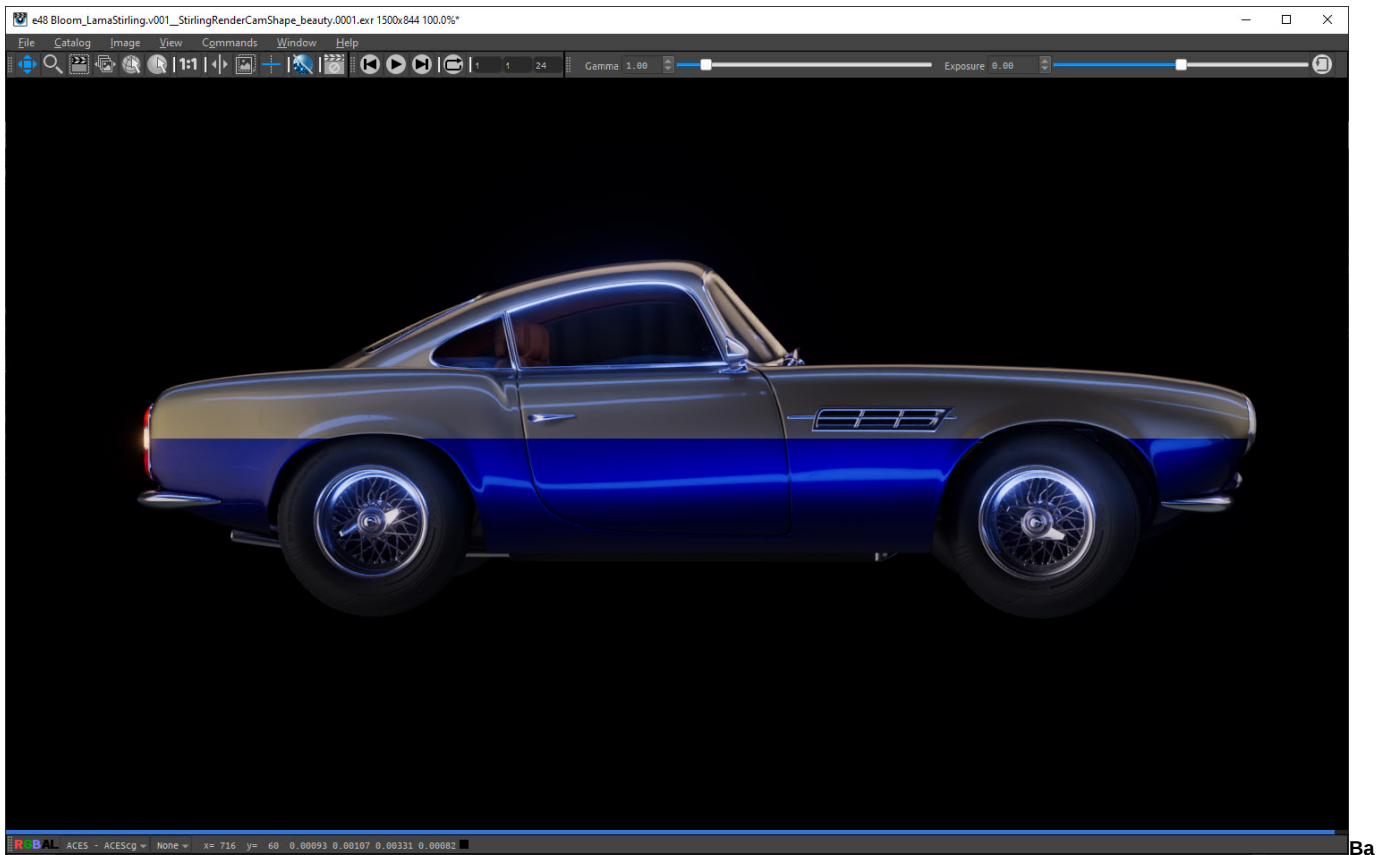
Reset Zoom

Resets any zoom applied while using the **Zoom Tool**. (Default hotkey: **X**)

Wipe Tool

Allows you to wipe between two images in your catalog. (Default hotkey: **4**)

To use, select the first image in the catalog, then go to **Image->Toggle Background**. Then, select the second image in the catalog, and with the Wipe Tool turned on, left mouse button click and drag in the image window.



Background

Toggles the current image as a background. See [Background](#).

Wipe Direction

Changes the direction of the wipe tool (vertical or horizontal)

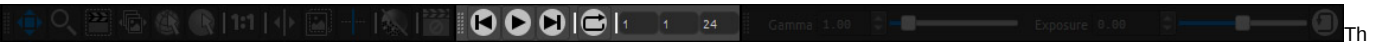
Denoise

Activates the Denoiser for the current IPR / Image

Cancel Render

Cancels the current incoming render

Sequence Controls



The sequence controls sections gives you access to controls on image sequence playback. From the left-to-right, they are:

Step Back Frame

Step back one frame in the sequence. (Default hotkey: **Left**)

Play Sequence

Play/pause playback of the sequence. (Default hotkey: **Space**)

Step Forward Frame

Step forward one frame in the sequence. (Default hotkey: **Right**)

Loop Mode

Toggle on or off playback looping of the sequence.

For further explanation of Sequences, see [Sequences](#) under the [Special "it" Features](#) section.

Monitor Controls



The monitor controls give you access to settings such as Gamma and Exposure. The right-most button resets the Gamma and Exposure controls to their defaults. There are also some useful monitor control hotkeys, including:

Exposure Up 1 F-Stop

(Default hotkey: **Ctrl/Cmd +]**)

Exposure Down 1 F-Stop

(Default hotkey: **Ctrl/Cmd + [**)

Gamma Up 0.1

(Default hotkey: **Ctrl/Cmd + }**)

Gamma Down 0.1

(Default hotkey: **Ctrl/Cmd + {**)

Pixel Readout

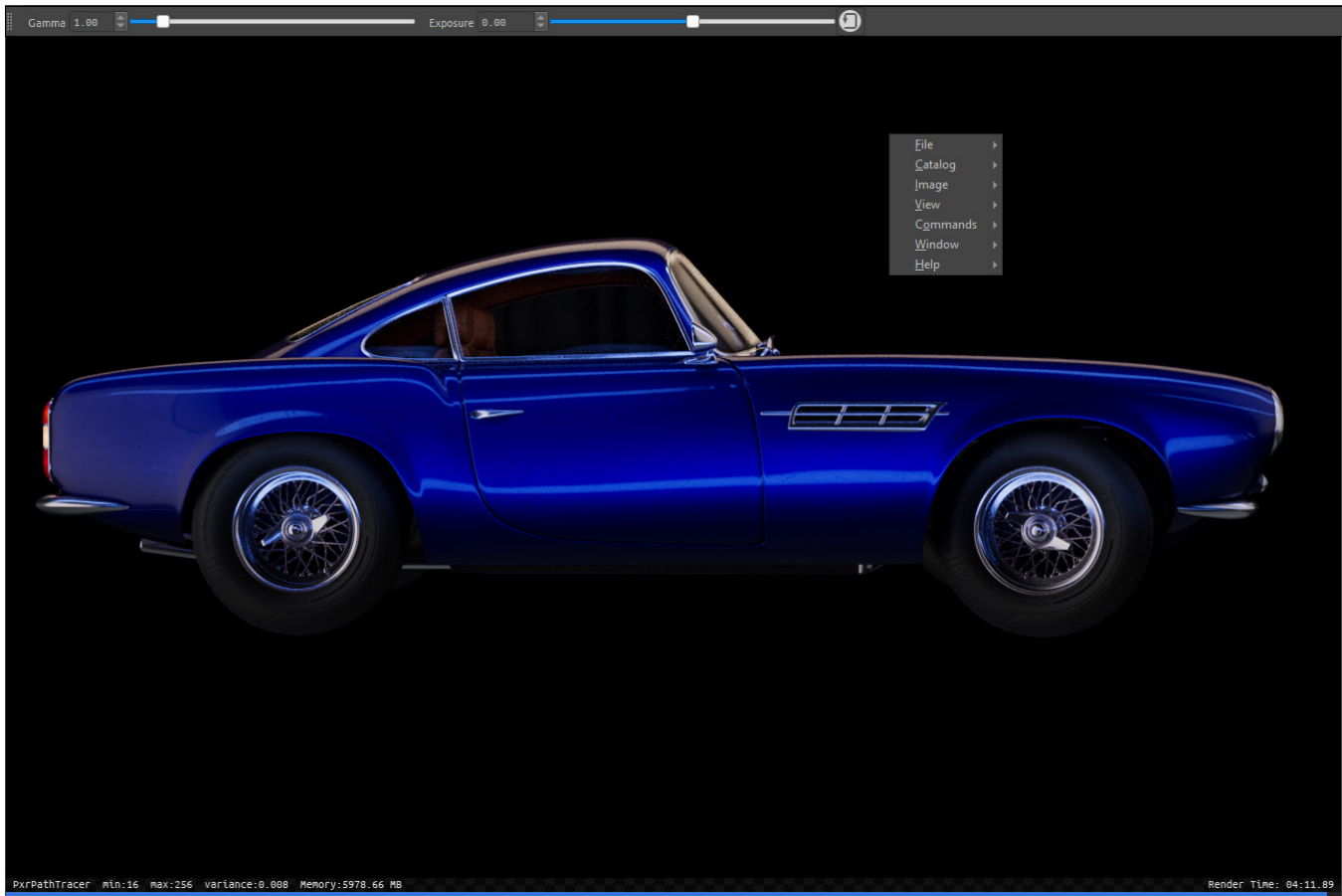


The Pixel Readout window gives you control over the viewing color space, various heat maps / look, pixel remapping, as well as information regarding the current pixel that is under the mouse cursor, including pixel coordinates and pixel values. You can lock the current pixel readout by going to **View->Lock Pixel Readout** (Default hotkey: **M**). The remap menu allows some post-processing to be performed on the image (re-mapping) before it is displayed. This does not alter the pixel values in your images. See [Remapping](#) for more information.

The channel view shows which of the image channels are currently visible and the options are RGB (normal color) Red, Green, Blue, Alpha (if present), and "Luminance".

Other

Right-clicking in the image area of the window also provides access to the menus. Other windows that are accessible on the "Window" menu such as the "Console", which provides python scripting access to "it" are not dockable and appear as top-level windows.



Preferences Window

General

Save Sessions

Controls whether "it" session data should be considered valuable. If turned on, a save dialog will be presented when image catalogs are closed.

Image Cache Size

The number of images "it" should hold in memory. When exceeded, "it" will move the oldest image to a temporary file in the Scratch Image Location.

Scratch Image Location

The location where images are saved if the total number of images in all catalogs has exceeded the Image Cache Size preference.

Maximum Zoom

Limits how much "it" will zoom in and out.

Short Window Titles

When toggled on, only the image filename will be displayed in the window's title bar.



IT will now burn in the color space automatically when you save to jpg or other 8Bit image formats

Appearance

New bucket indicator

This allows you to edit the color of the recent bucket marker. See [Recent Bucket Markers](#).

Events

Focus Incoming Render

If toggled on, the image window will automatically display the current incoming render.

Display Mapping

Sets which view mapping to use when Automatic view mapping is selected from the remap menu, for different bit depths (8-bit, 16-bit, Float) and whether the image is from an incoming render or from disk.

Shortcuts

Allows you to edit any of the hotkeys mapped to specific commands in "it".

Special "it" Features

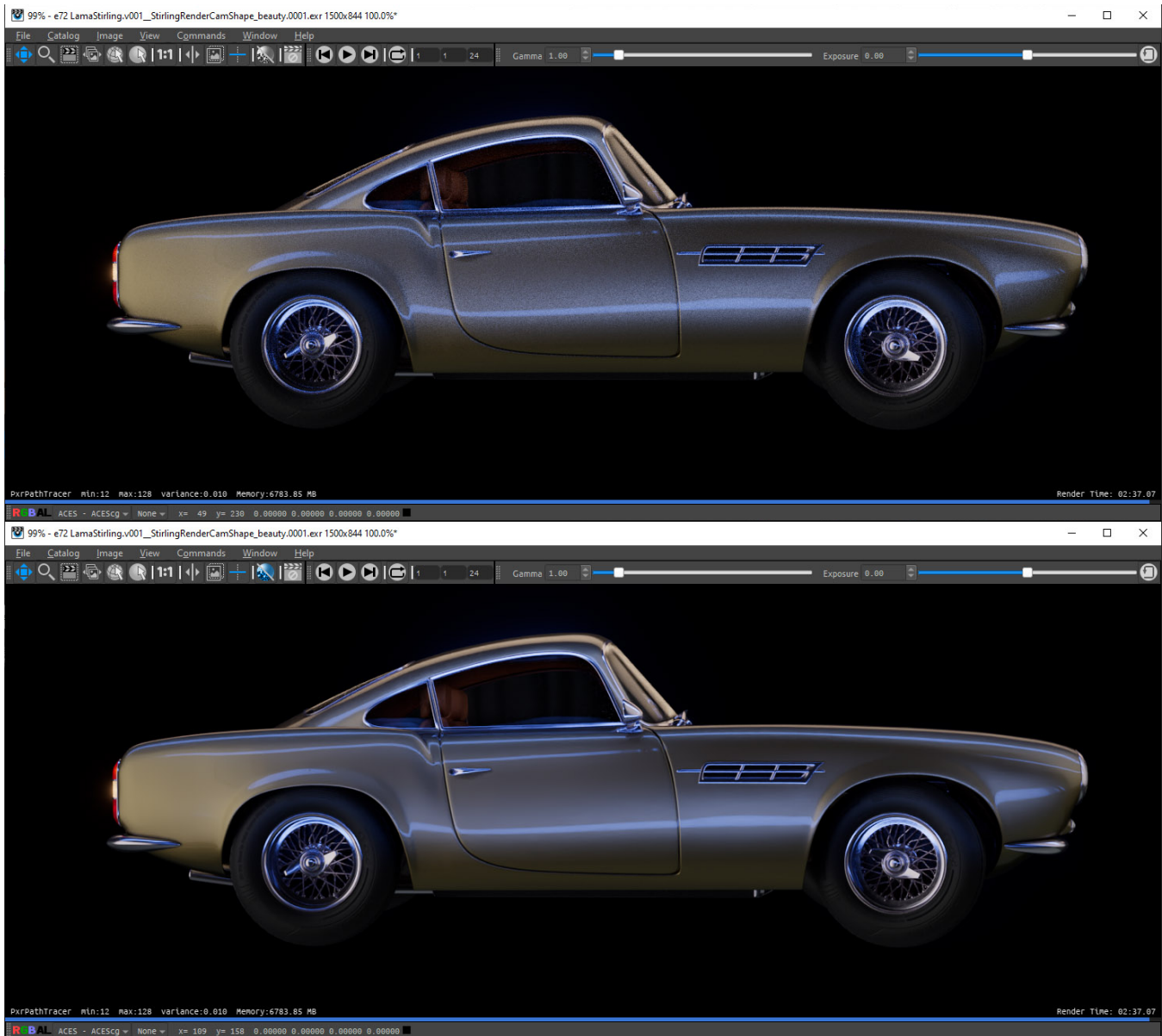
AI Denoise

"it" can interactively denoise beauty renders for preview purposes using [Nvidia's AI Denoising](#) solution. You can choose this in the View menu or press N on the keyboard to toggle this on and off. This requires the latest Nvidia drivers (391.89 as of this writing) and an Nvidia GPU on the system that is reasonably modern (Minimum is Kepler, newer cards will perform significantly better). Images that are more converged (has more samples) will achieve better quality. Insufficient convergence will resemble a watercolor or "painterly" style image.

This feature is meant for interactive preview rendering only, it is *not* designed for final renders or animation. AI Denoise only operates correctly on the beauty (Ci) and not on AOVs. To correctly view AOVs, toggle the denoiser off or you will see artifacts. The final EXR output is unaffected by the denoiser. Use the Snapshot feature of "it" to save the denoised Beauty instead (see below this entry).



Denoising options want statistically independent pixels, this means you should either manually provide the rendering option for "Importance Sample Filtering" for pixels or select the Denoise option in the appropriate bridge product that will enforce the Importance Sample Filter for images. If this is not enabled then no change will be seen when using the Optix Denoiser. The requirements for Optix 7 must be obeyed, meaning hardware must be the Nvidia Maxwell generation or newer for this version.

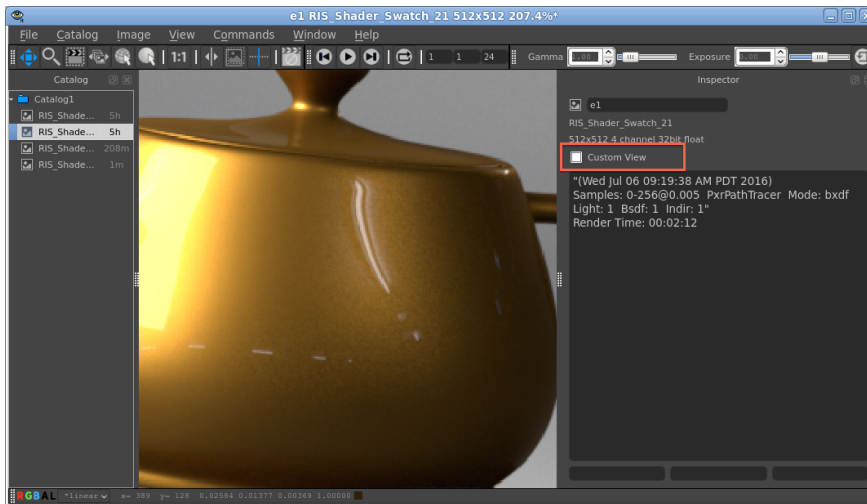


Snapshot

From the Commands window, you can choose to Snapshot an image. This makes a quick copy of either a completed render or an (in-progress) interactive session. There is also an option for No AOVs should you just need to capture the beauty render. This is useful for interactive sessions where you want to save how a current scene looks before you make a change and then compare them. This places the snapshot next in the Catalog list. To save an image that is using the Nvidia AI Denoiser, you must use Snapshot as an export will only save the underlying raw image.

Views

Views in "it" are a combination of zooms, pans, pixel aspect ratio, and view mappings. By default all images in a catalog share a view. This is convenient when you want to step through a shot that you've rendered to "it" (hotkey PageUp/PageDown). When you zoom in and step to the next frame in the shot the zoom and pan remain the same. However, sometimes you'd like to be zoomed way in on one image to look at some feature and then flip between that and a zoomed-out image. "it" accommodates this with *Custom View*. When you turn on *Custom View* for an image, that image then has its own zoom and pan, independent of the other images in a Catalog. Custom Views are saved if/when the Session (or Catalog) is saved.



Pixel aspect ratio is useful when working on projects that generate non-square imagery. One example of this is the film format Cinemascope. In some pipelines you might decide to keep your digital files in a format where a pixel is half the size in the horizontal direction than the vertical. 'it' allows you to specify this in the view so that on your monitor images look normal. This menu is fully configurable from your it.ini file including the names on the menu and the aspect ratio of the pixels. You may also attach shortcut keys to different aspect ratios even if you customize this menu.

HUD

Selecting View->View HUD Numbers (lowercase 'v') will then toggle a heads-up display containing image stats

Can you change the HUD location and format using View->Move HUD Numbers (uppercase 'V'): changes HUD location and format

Moving the HUD cycles through:

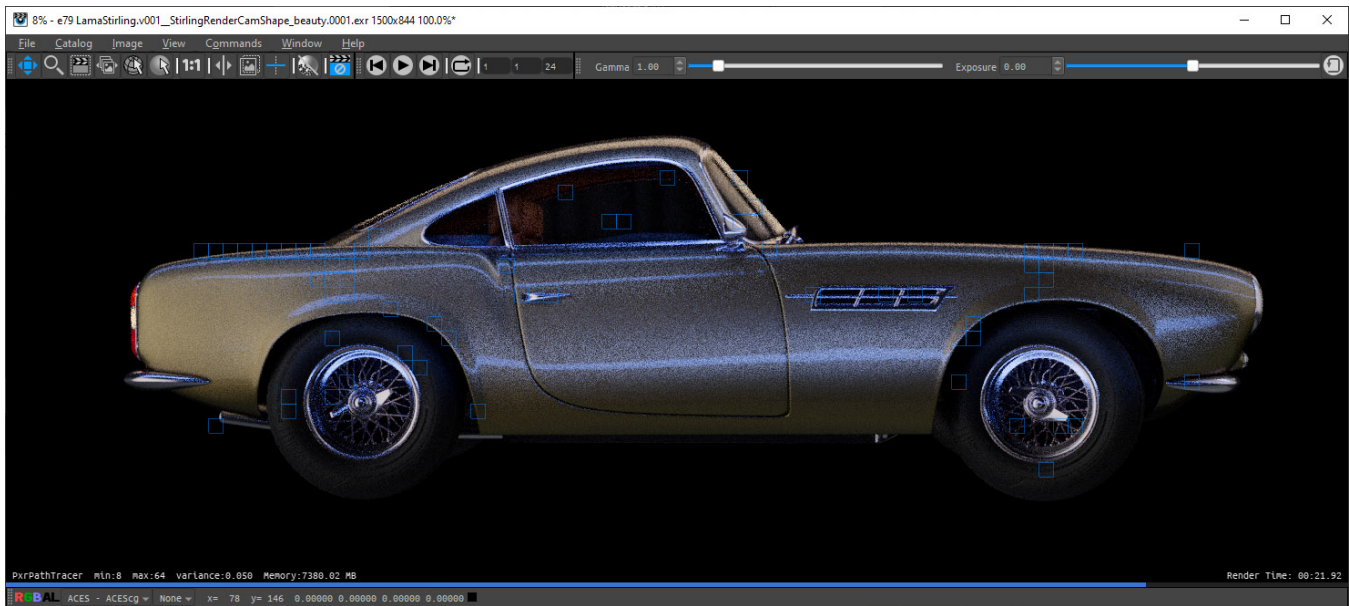
- top-left (default)
- top-center
- top-right
- bottom-right
- bottom-center
- bottom-left

Left/Right HUD: Rays/Sec, Mem, CPU %

Centered HUD: Integrator, min/max samples, variance, memory, render time

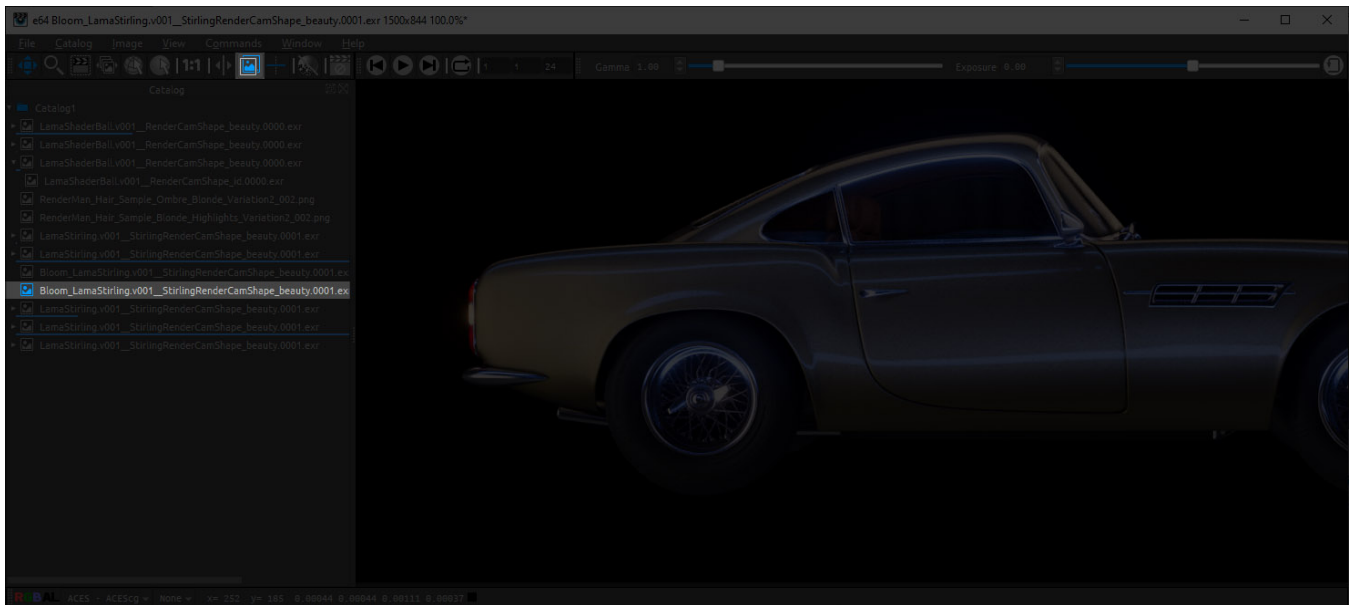
Recent Bucket Markers

When 'it' is being used as the destination for a render it will display a rectangle around each bucket as it arrives. The indicator will fade over a few seconds. This is useful when an image is being refined as it is sometimes difficult to see what part of the image the renderer is working on. This feature can be toggled on and off and the color of the rectangle can be altered in the preference dialog.



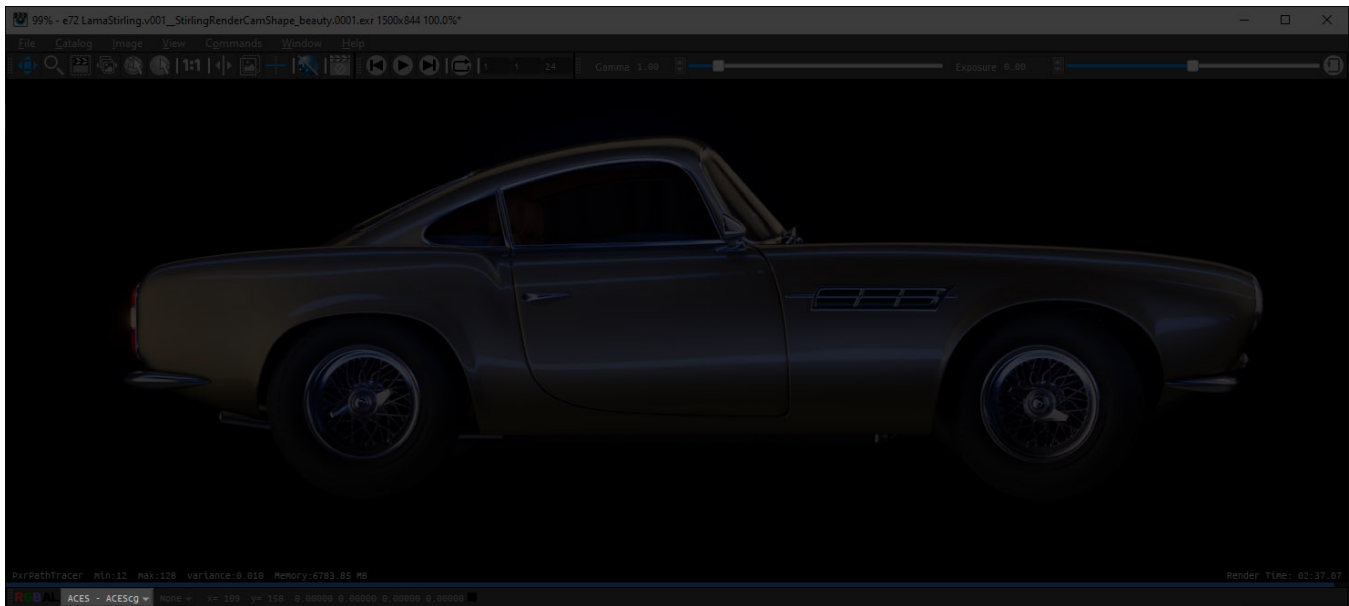
Background

Any single image in a Catalog can be set to be the *Background* image. When you then select other entries in that Catalog, the displayed image is the result of compositing the selected image *over* the nominated background. To toggle the current image to be a background image, use **Image->Toggle Background**. The icon next to the image in the Catalog will then light up. See [Working With Background Images](#).



Remapping

The remap menu shows the color space that your image is in. Typically this would be linear for rendered images and sRGB for 8-bit image files. By default "it" chooses the image space of the image and when it does this the image space is preceded by a *. You can use the menu to override "it"'s choice (the * indicator will go away)



"it" supports view mapping output images to accommodate your workflow of choice using the [OpenColorIO](#) system. Your view mapping defaults can be set for images rendered to "it" as your frame buffer (regardless of bit depth) or for imported images (with different mapping for different types, if necessary).

There are several important things to remember about remapping:

- Remapping is applied only for viewing files. It is not burned in. See [Burn Mapping On Save](#) preference.
- Images rendered via RenderMan are, by default, in linear space, unless exposure is applied to the output (which can be done in RfM via the Output Settings tab of the RenderMan controls).
- If you do apply an exposure to your output, be sure to make the proper adjustment to the default image mapping for rendered images.
- The OpenColorIO setup can be changed via your it.ini, though, as always, we strongly recommend making the changes in a site-specific surrogate ini file, referenced via RMS_SCRIPT_PATHS. "it" will also use the environment variable OCIO if it is set to find the OpenColorIO config file.

A special entry on the remap menu is the Shadow Map option, which is useful for viewing shadow map files. These files can have huge ranges that are well beyond zero to one, so the traditional way to display these has been to rescale the min and max values to zero and about 0.9, and then invert them with $(1 - \text{val})$.

Sequences

Sequences are for when you've rendered a shot or perhaps a wedge of parameters to a shader and now you would like to see them all played as a sequence. The Sequence toolbar has the controls for starting and stopping playback and the frame range controls. "it" will either play the whole catalog or you can open a set of images on disks as one element (called a "sequence"). There is also a "scrub" mouse tool which when activated lets you move through a sequence by dragging with the left mouse button in a horizontal direction.

An image sequence can be created by opening multiple files on disk in a directory, use **File->Open Sequence** instead of **File->Open Image**. "it" will discern which files belong to the sequence, and the frame range will appear in the Sequence toolbar.

Sequences are low tech in that they don't provide a way to save or load movies, and the entire "movie" is held in RAM. "it" places a cap on the number of images it will hold in RAM so for smooth playback you will need to set that cap (Image Cache Size) to at least the number of frames in your sequence.

Color chart generator

The photo and film industry has been using [color rendition charts](#) for decades to ensure high-quality results. You can learn more by reading one of [many articles](#) on the topic.

It offers a standard color chart generator (using published sRGB values) that can be used in your look-dev renders as an stable color reference.

- The color chart is generated at 1024x768

- The image should be saved as a 8-bits image (tiff, png) with **Burn Mapping** enabled.
- Reference it in [PxrTexture](#) and enable **Linearize**.

Analysis Tools

Diff

This command will compute the difference between 2 images from the catalog. Typically, you might want to generate a heat map from the diff image (see below).

Find Variance

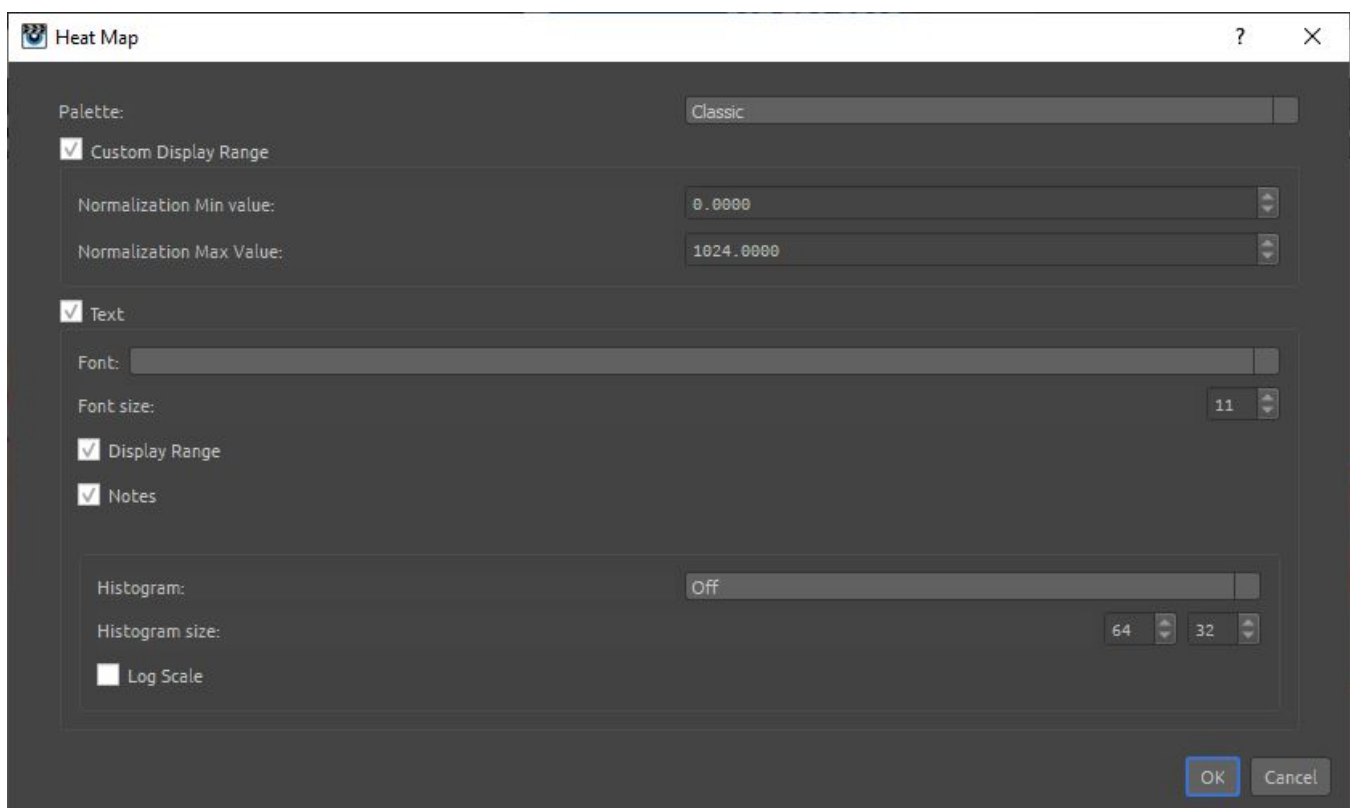
This command computes the variance of an image compared to a reference image.

Heat Map

Often, it is useful to create a heat-map from a data image to visualize its content. This function offers a few controls to generate heat maps from single-channel images or the luminance of a color image.

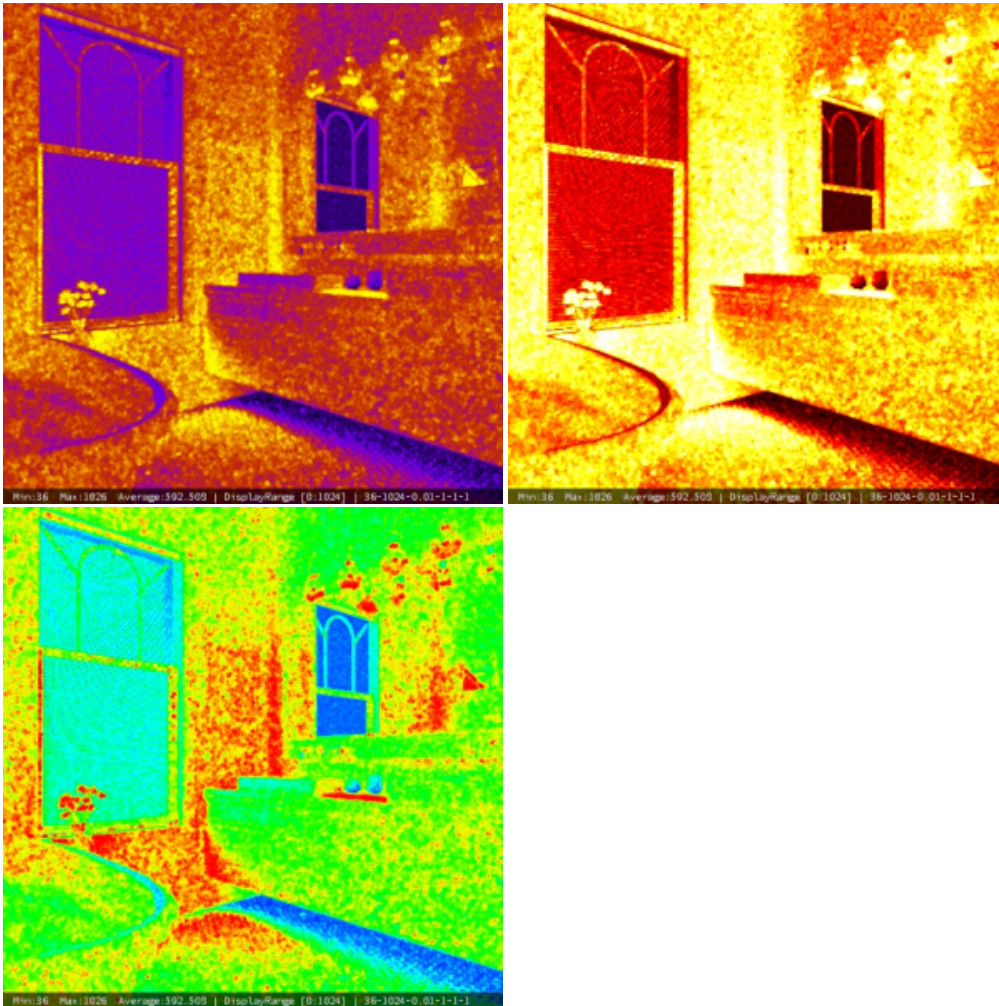


- You can select more than one image to process at once.
- Keep the Shift key pressed to skip the dialog and process the image(s) with your last settings.



Palette

There are 3 different palettes you can choose from: Classic, Fire and Hue.



Custom Display Range

When this is un-checked, the heat map is displayed using the pixels' min-max values, otherwise it uses fixed values of your choice. It is useful to use a fixed range when comparing different images, like the `sampleCount` or `cpuTime` AOV for different renders.

- **Normalization Min Value:** the lowest value visualised.
- **Normalization Max Value:** the highest value visualised.

Text

You can add some text at the bottom of the image with the minimum, maximum and average values, plus a couple of optional fields:

- Font: choose a font you like
- Font size: adjust the font size, bearing in mind that everything must fit on a single line.
- Display Range: display the custom display range values.
- Notes: display any notes the source image might hold.

Isolate Values

Isolate values

Pixel Value
>
1.0000
1.0000
1.0000

Cancel OK

This simple command replaces with black any values that don't pass your test. You can compare the pixel value or luminance to a fixed value, using <, <=, ==, >= and >.

This is useful to find specific values in an image.

Dump Metadata to message log

Retrieve an image's metadata and display it in the message log window. Note that only loaded images have metadata.