

Gelato Image Viewer (iv) User's Guide

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Introduction

The NVIDIA Gelato Image Viewer, or "iv" for short, is a tool for displaying 2D images. iv can display a wide variety of image formats, including 16-bit and floating point formats and can display either single or multiple images. iv can be used to perform a variety of functions, including:

- Viewing 2D images
- Image sequence playback
- Comparing and contrasting different versions of an image (looking for minute differences between different renders)
- Controlling the progress of a Gelato render that is underway

While iv was created to be used in conjunction with the Gelato final-frame renderer, the tool is independent of Gelato and can be used in conjunction with other products or as a stand-alone tool. While it is packaged with Gelato, the renderer does not require use of iv, and other image viewing tools can be substituted, such as the Maya Render View using the Mango plugin.

Installation & Licensing

iv is contained in the Gelato software package and is automatically installed and uninstalled with Gelato. The Gelato software end user license agreement covers iv and all

terms of that license apply to the tool. At present iv cannot be installed or uninstalled separately from the renderer. In other words, you must have Gelato installed on your machine to use iv.

iv is not, however, restricted by the Gelato license key. While the license agreement governs the legal use of iv, you do not need a license key from NVIDIA to use iv.

Supported Image Formats

iv supports any image format for which there is an installed Gelato image I/O plug-in. You can extend this functionality by creating plug-ins for new image formats (see the Gelato Technical Reference for details).

iv and Gelato currently ship with the following image I/O plug-ins:

- TIFF
- IFF
- PPM
- OpenEXR
- JPG
- HDR
- DDS

In addition to the above, Gelato ships with a DevIL image I/O plug-in that supports:

- BMP
- SGI
- PNG
- TGA

Starting iv

There are several ways to launch iv:

- To view the progress of a live render, iv can be launched from the Gelato command line using the `-iv` parameter:

```
"%GELATOHOME%"\bin\gelato -iv foo.pyg foo1.pyg Windows
```

```
$GELATOHOME/bin/gelato -iv foo.pyg foo1.pyg Linux
```

- Renders launched with this parameter will open iv and display the in-progress render. iv will remain open once the render is complete. Renders that do not use the `-iv` parameter will render to file with no display unless manually specified via an Output statement in the input scene file.
- Existing image files can be opened from the command line with the syntax:

```
iv foo.tif
```

- Multiple images can be loaded from the command line at one time by simply listing them in sequence:

```
iv foo1.tif foo2.tif foo3.tif
```

- Existing image files can also be opened using the file/open command in the iv menu structure.
- By launching the iv executable file, `iv.exe` (Windows) or `iv.sh` (Linux), either by typing `iv` on the command line or double clicking on the file. This will launch an instance of iv with no open images.
- By associating a particular file type (e.g., `*.jpg`) with iv, you can launch iv whenever that file type is opened. The Gelato installation does not associate any file types with iv; you must do this manually if you wish iv to be the default viewer for particular file formats.

You may have multiple instances of iv open at any given time and multiple images open within each instance. There is no arbitrary limit on the number of iv instances or images you may have open at any given time. You are only limited by system resources.

The iv Window

The iv window consists of five major components. The **Title Bar** lists the name of the active image and, if it was rendered by Gelato into the iv window, the time the image was created. The **Menu Bar** has five menu options, *File*, *Edit*, *View*, *Tools*, *Help*. The **Button Bar** contains several buttons for controlling the display of the image and a drop-down menu listing recently opened images. The **Image Pane** displays the active image. And finally, the **Information Bar** at the bottom gives metadata about the image and access to the Gelato error log.




Button Bar

The button bar has a number of different tools for viewing images and controlling live renders. These can functions can also be found under the *View* and *Tools* menus. Some of the button bar options govern the behavior of the mouse buttons in iv.


Zoom

The most basic tool is **Zoom**. When iv opens, the zoom tool is already selected. If you have selected another tool, you can re-select zoom by hitting the zoom button on the button bar or the zoom radio button in the *Tools* menu. If you are using any other tool, holding down Alt will temporarily switch to the zoom tool. Zoom is controlled by the mouse: left click to zoom in; right click to zoom out. Zooming is done in by powers of 2, ranging from 1:16 (-4) to 16:1 (+4). If the zoom is at any setting other than 1:1 (0), the current zoom setting is shown on the information bar at the bottom of the iv window.

Mode	Zoom in	Zoom out
 Zoom tool	Left mouse button	Right mouse button
Alt +	Left mouse button	Right mouse button
Ctrl + Mouse wheel	scroll up	scroll down
Hotkey	Plus (+)	Minus (-)


Select

The **Select** tool can be chosen either via button bar or the *Tools* menu. Select allows you to delineate a rectangular section of the image for various purposes. You do this with the left mouse button (click to select a point, drag to select a region). Once a region is selected, you can modify it by left clicking on any one of the corners and dragging. Left clicking anywhere else in the image pane will remove the box.

Mode	Select
 Select tool	Left mouse button
Shift +	Left mouse button

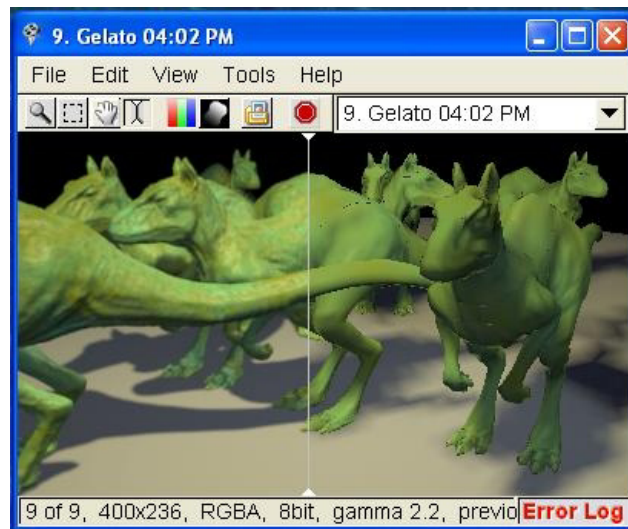
Pan

The **Pan** tool, accessed via either the button bar or the *Tools* menu, allows you to move the image in the image pane when only a portion of the image is visible. If the entire image is visible in the image pane, Pan does nothing. If only a portion is visible, left click and drag the mouse to move the image in the pane.


Mode	Pan
 Pan tool	Left mouse button
	Middle mouse button

Wipe

The **Wipe** tool, accessed via either the button bar or the *Tools* menu, allows you to split the image pane between two different images. It is only active if two or more images of the same size are loaded. You can select the Wipe tool via the button bar or the *Tools* menu. Once selected left click on the image and a dividing line will appear at that point with the current image on the left-hand side of the image pane and the previous image viewed on the right. The dividing line can be moved by left-clicking on it and dragging, "wiping" one image with the other.



Selecting another open image from the drop down menu or opening a new image will load the new image in its entirety. Subsequent clicking on the image pane will again split the pane. To remove the split pane switch to another image or manually reload (hotkey = enter).

Mode	Wipe
 Wipe tool	Left mouse button
Ctrl +	Left mouse button

Full Color/Alpha

The **Full Color** and **Alpha** buttons toggle between a display of the red, green, Blue, Alpha, and luminance channels or the alpha channel only. The controls can also be accessed via the *View* menu or the hotkeys, c, r, g, b, a, and l, respectively. Selecting Full Color button, from the menu, or with the c hotkey will return you to the normal display.

For volume shadow maps and images with more than four channels, only one channel is displayed at a time. The **Previous Channel** and **Next Channel** controls in the *View* menu will change which channel is displayed. The hotkeys are comma and period. Also, the **Red**, **Green**, **Blue**, and **Alpha** commands will jump directly to channels 0, 1, 2, and 3, respectively.

Store Image

This button makes a copy of the image and stores it in RAM, accessible via the iv drop-down menu of images. During normal image viewing and Gelato renders, this button is usually unneeded, simply making a copy of what is in the image pane at the moment the button is pressed. The button becomes important during Sorbetto re-renders. Normally, only one copy of the Sorbetto image, the latest, is retained by iv. Remember that these images are only stored in RAM and will be deleted if iv is closed without saving them.

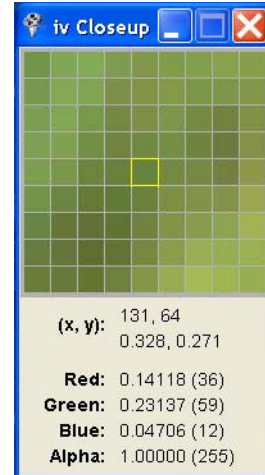
Kill Render

This button kills the active Gelato process.

Special Functions

Pixel View

The **Pixel View** window can be used to examine individual pixels at high magnification. When the Pixel View window is opened via the *Tools* menu or p hotkey, it displays the pixel under the mouse and the surrounding 80 pixels. The window also displays the X-Y coordinates of the pixel under the mouse and its RGBA color information. The **Freeze Closeup** command, hotkey x, will hold the Pixel View at the current pixel, allowing you to move the mouse without changing the Pixel View. This is particularly useful if you need to copy the pixel information into another window. You can **Unfreeze** the Pixel View by again hitting x or via the *View* menu. The Pixel View window remains in true, full-color mode at all times, regardless of what is being displayed in the image pane.



Comparing & Contrasting Images

iv is particularly useful when contrasting two or more similar images, looking for minute differences between them. The Wipe and Toggle tools are particularly useful for this. iv also allows you to apply random colors to the pixels via the *View* menu or hotkey shift-R. When used in conjunction with the Wipe or Toggle tools, the random colors make it easier to identify which pixels have changed. You can then revert back to full color to determine the nature of the change, or use the Pixel View window, which always remains in true, full-color mode, on the pixel in question. The subtract option (hotkey s) will subtract the previous image from the current and display the absolute value of the difference for each pixel. Subtract can also be combined with wiping and random colors to highlight differences.

Flipbook Mode

Flipbook mode allows you to view an animation sequence or to present or demo a series of images in sequence. The Flipbook can also be launched from the command line or from a script; see the section on Command Line Options for details.

The speed of the flipbook playback can be varied from many seconds per frame (values between zero and 1) up to full speed, which varies depending on image size and system performance. Playback speed and direction can be modified via the *Tools* menu or on the command line.

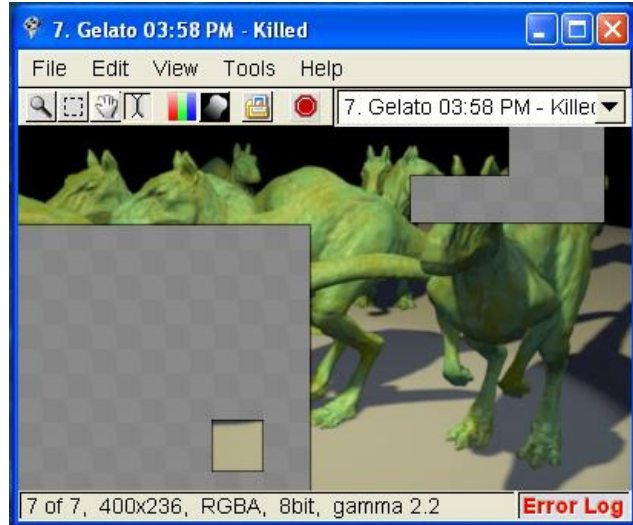
The arrow keys can be used to play forward or backwards (right and left arrow) or to speed up or slow down the playback speed (up and down arrow). Hitting any arrow key during playback will stop playback.

Sequences can loop using either standard looping (ABCDABCD) with a pause at the end of the sequence, or ping-ponged (ABCDCBABCD) without any pause.

Controlling Live Renders

iv can be used to interactively control live Gelato renders. This **Interactive** mode is enabled whenever a Gelato render is launched with the `-iv` parameter, which instructs Gelato to send the completed tiles to iv as they are rendered. Alternatively, you can use the `Output` statement to specify iv as the destination of a render in the Gelato scene files.

If an instance of iv is open when a new render is started, the render process will create an new image in the current iv and send rendered buckets to that image. If you launch multiple renders at the same time, they will all be sent to iv and you can view their progress by toggling or using the drop-down image menu. If you wish to force the render to start a new instance of iv, you must first disconnect the current instance, using `Ctrl + d` or the command in the *Tools* menu.



You can instruct Gelato to render a particular part of the image first. Use the `Select` tool (or simply shift-left-click) to select a pixel, and Gelato will render that bucket next and then proceed to render adjacent buckets in an expanding outward spiral. You can also use the `Select` tool (or simply shift-left-drag) to draw a rectangle and Gelato will render the contents of the rectangle first. (These require that `Prioritize Selection` is active in the *Edit* menu, which it is by default.)

You can kill an in-progress render with the `Kill Render` button on the *Button Bar*, with `Ctrl + k`, or by the command in the *Tools* menu.

You can display multiple outputs from a single Gelato render on different iv pages. By default, iv will only display the first `Output` statement (or `RGBA` if no `Output` statement exists) in the input scene files. By adding `"-data all"` to the gelato command line, Gelato will send each `Output` statement to iv as a separate page.

Menu Options & Hotkeys

File Menu

Control	Hotkey	Functional Description
Open	Ctrl + o	Opens a new image from a file
Open Next	Shift + Ctrl + o	Opens the next file of the same type, in filename order, in the directory.
Close	Ctrl + w	Closes the active image. Note that if you turn off the "Ask before closing unsaved images" preference, the image will not be saved before closing. If the preference is on, you will be prompted to save modified images before closing.
Save As	Ctrl + s	Saves the active image to file
Save Window As	Shift + Ctrl + s	Saves exactly what is displayed in the iv image pane and not the entire image. If the image is zoomed, it only saves the visible portion. If random or false colors are applied, it saves these. It also saves anything else you see in the image pane, including icons, cursors, the wipe bar, etc.
Save Selection As		Saves the portion of the image that is bounded by the <i>Select Tool</i>
Reload	Enter	Reload the current image if it has changed on disk.
Previous Image	Page_Down	When multiple images are loaded, this displays the previous sequential image in the image pane
Next Image	Page_Up	When multiple images are loaded, this displays the next sequential image in the image pane
Exit	Ctrl + q	Closes the iv application. Note that if you turn off the "Ask before closing unsaved images" preference, any images will not be saved before closing. If the preference is on, you will be prompted to save modified images before exiting.



Edit Menu

Control	Hotkey	Functional Description
Copy	Ctrl + c	Copies the image to the clipboard. If the <i>Select Tool</i> is active, it copies the portion of the image bounded by the box to the clipboard
Paste	Ctrl + v	Opens a blank image and pastes the contents of the clipboard to it
Clear Selection		Deletes an existing select box.
Prioritize Selection		When selected, this allows you to dynamically select buckets for priority rendering. Left clicking on the image pane with the shift key down will start rendering in a spiral outward from that point. Creating a select box (shift-left-drag) will give priority to the buckets within the box.
Crop Selection		When you are in this mode and you define a new selection rectangle, a PYG file is written to temp/ivcrop.pyg that contains a single statement which sets the crop window used to restrict rendering to a subregion of the camera frame. If you input this ivcrop.pyg file before your other scene files, then the render will automatically be cropped to the selection region. You can have this file automatically read in by adding it to your \$HOME/.gelato.pyg file, or, in Mango, setting it as a special input file using the UI
Preferences		Opens the iv preference window; see below

View Menu





Control	Hotkey	Functional Description
Fit Image	Home	Automatically resizes the image so that the entire image is displayed within the current image pane
Fit Window	f	Automatically resizes the image pane so that it displays the entire image
Toggle	t	Switches the current image and the last viewed image back and forth in the image pane.



Stop Up] or }	Brighten the image by increasing the exposure by one point (1/10th of a stop). The Brace '}' will increase exposure by a full stop. This is particularly useful when viewing floating point image formats with large dynamic ranges.
Stop Down	[or {	Darken the image by decreasing the exposure by one point (1/10th of a stop). The Brace '{' will decrease exposure by a full stop.
Gamma Up)	Increases the gamma setting of the image in the image pane by an increment of 0.1
Gamma Down	(Decreases the gamma setting of the image in the image pane by an increment of 0.1
Background Image		Allows you to specify a background image in the image pane, visible through transparent elements of the current image. Iv will not scale the images to match each other. If the images are not of the same size, iv will extend the last row and column of the background image. For example, if you specify a 1x1024 vertical ramp image as the background, it will be stretched horizontally across the entire image background.
Foreground Image		Allows you to specify a foreground image in the image pane; the current image will be visible only through the transparent regions of the foreground image. Iv will not scale the images to match each other. If the images are not of the same size, iv will extend the last row and column of the foreground image.
Surround Color		Changes the color of the image pane background that is visible around the edges of the image. Options are black, mid gray, light gray, and white.
Freeze Closeup Pixel	x	When the Pixel View Window is open, this holds the Pixel View Window centered on the current pixel, allowing you to use the mouse for other purposes
Fullscreen	Ctrl + Space	Enlarges the image pane so that fills the entire monitor screen; use Ctrl + Space to revert to the previous, smaller size
Random Colors	R	Applies a random color map to the pixels; useful when contrasting images for minute differences

False Color		Applies a "thermal" false coloring color map to the image. Most useful when looking at a single channel or a grayscale image. Changing exposure up and down with the [and] hot keys can bring out specific details.
Subtract	s	Subtract performs a subtraction between the previous and current images. Each pixel in the previous image is subtracted from the current one and the absolute value is displayed in the window. If difficult to see, the difference can be enhanced by adding the random color map, hotkey R. This is a useful comparison tool.
Stereo		Toggles stereo mode. If the previous and current images match in size (similar to wiping), this will display the previous image in red and overlay the current image in blue. This feature is designed to work with stereo cameras in gelato, but it will work with any two left-right images.
 Full Color	c	Displays the full-color image (RGBA)
Red	r	Displays the red color channel of the image in the image pane
Green	g	Displays the green color channel of the image in the image pane
Blue	b	Displays the blue color channel of the image in the image pane
 Alpha	a	Displays the alpha (opacity) channel of the image in the image pane
Luminance	l	Displays the brightness of each pixel, calculated from the RGB values.
Previous Channel	, (comma)	In single-channel display, decrements the channel number being displayed; this is useful in examining volume shadow maps and images with more than four channels.
Next Channel	. (period)	In single-channel display, increments the channel number being displayed; this is useful in examining volume shadow maps and images with more than four channels.
Previous Subimage	< (less)	If the active image has subimages, this moves to the previous subimage; this is useful in examining the various MIPmap levels in a texture file

Next Subimage	> (greater)	If the active image has subimages, this moves to the next subimage; this is useful in examining the various MIPmap levels in a texture file
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Tools Menu

Control	Hotkey	Functional Description
 Zoom	Alt	Activates the Zoom Tool and hotkey commands; used to zoom in and out on the image; '+' and '-' are hotkeys for zoom
 Select	Shift	Activates the Select Tool and hotkey commands; used to select a portion of the image
 Pan		Activates the Pan Tool and hotkey commands; when not all the image is visible in the image pane this is used to re-center the image pane on a different portion of the image
 Wipe	Control	Activates the Wipe and hotkey commands; when multiple images are open this tool allows half the image pane to show one image and the other to show another; useful when contrasting images with minute differences
Show Pixel View	p	Opens/Closes the Pixel View Window which shows a 9 x 9 grid of individual pixels and X/Y coordinate and RGBA color information for the center pixel.
Hide Controls	m	Hides the Menu and Information Bars. You must use the hotkey, m, to bring the controls back.
Show Error Log	e	Opens the error log window. The error log window can also be opened by clicking on "Error Log" in the lower right-hand corner of the iv window.
Annotate		Allows you to add comments to the image that appear on the information bar. This is useful for distinguishing images that have subtle distinctions. The annotation will be saved to certain image formats (currently only TIFF).
Overwrite Render		Checking this box will overwrite the current image with the next render.

Disconnect	Ctrl + d	Disconnects iv from the live render. The render process will continue writing to a file, but newly rendered buckets will no longer be displayed in iv. If a live render is not in progress when iv is disconnected, the next render will spawn a new instance of iv instead of creating a new image in the current instance.
 Kill Render	Ctrl + k	Kills the render in progress
 Store Render		Makes a copy of the current image and inserts it into the image list, for later viewing; useful for saving Gelato renders when Overwrite Render is selected.
Play Forward	Right Arrow	In Flipbook Mode, displays the images in order
Play Reverse	Left Arrow	In Flipbook Mode, displays the images in reverse order
Faster	Up Arrow	In Flipbook Mode, displays more frames per second
Slower	Down Arrow	In Flipbook Mode, displays fewer frames per second
Loop		In Flipbook Mode, displays the sequence in a continuous loop, starting again at the beginning when the sequence is finished.
Ping Pong		In Flipbook Mode, displays the sequence of images, then the sequence in reverse, and then the cycle repeats until stopped.

Help Menu

Control	Hotkey	Functional Description
iv User's Guide		Displays this iv User's Manual
About iv		Displays information about the iv program

Other Hotkeys

	Hotkey	Functional Description
	Plus (+)	Zoom in
	Minus (-)	Zoom out

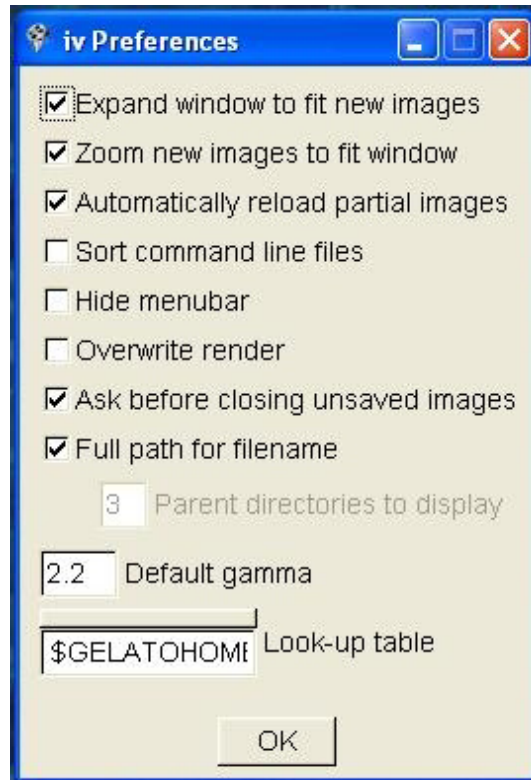
Mouse Buttons

Mode	Left	Middle	Right	Wheel up	Wheel down
 Zoom	Zoom in	Pan	Zoom out		
 Select	Select	Pan			
 Pan	Pan	Pan			
 Wipe	Wipe	Pan			
Modifier	Left	Middle	Right	Wheel up	Wheel down
Control	Wipe			Zoom in	Zoom out
Alt	Zoom in		Zoom out		
Shift	Select				

The iv Preference Window

The preference window is opened via the *Edit* menu. This window allows you to alter basic iv settings. Changes to these preferences enter into effect immediately and are applied to future sessions of iv until they are again changed.

Iv currently saves preferences into a file in your HOME directory called ".ivrc". You *must* have a HOME environment variable for this to work correctly. Under Linux, the HOME environment variable is automatically defined by the shell, but under Windows, you must define this variable manually.



Expand window to fit new images	iv will increase the size of the image pane to accommodate new images when they are opened. If this option is unchecked, only a portion of a large image will be visible in the image pane when it is loaded. (You can pan to view the portions not displayed.) This option is on by default.
Zoom new image to fit window	iv will increase the size of a new image to fit into the existing image pane. If this option is left unchecked, small images will be centered in the image pane, surrounded by a background color. This option is on by default.
Automatically reload partial images	If you open an image that has only partially completed rendering, iv will display the finished portion, and then, if this option is enabled, will continue to check the file every few seconds to see if new data has been written. If so, it loads the new data and updates the view. This option is on by default.
Sort command line files	When this preference is checked, iv will sort input files listed on the command line so they come in frame number order (e.g., foo.9.tif comes before foo.10.tif). Left unchecked, iv will sort them alphabetically by filename. This option is particularly useful when loading a series of images to play in a flipbook. This option is off by default.
Hide menubar	Checking this option will hide the menu and information bars. Controls can still be accessed via hotkeys. This option is off by default.
Overwrite render	Checking this option will delete the current image from iv when a new image is rendered. This saves system resources when you are tweaking an scene and do not want to compare the previously rendered images with the new one. This option is off by default..
Ask before closing unsaved images	Checking this option will prompt you to save images when you close iv. This option is on by default.
Full path for file name	Unchecking this option will clip the display of the file's path to the number of trailing (parent) directories specified. This option is on by default.
Default gamma	Overrides the system environment variable that specifies the gamma settings. The default can, in turn, be manually changed for each image under the <i>View</i> menu.

Look-up table	<p>This preference dialog specifies the location of the Lookup Table (LUT). The default is \$GELATOHOME/etc/iv.lut. The LUT allows you to make a file containing 256 RGB entries which map 8-bit input values from an image to 8-bit output values for display on the screen. This is used to mimic the various film-response curves for each type of film negative and process. To use the LUT, you create a file with 256 lines, each line containing three numbers between 0-255, like this:</p> <pre>0 0 0 1 1 1 2 2 2 etc.</pre>
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Command Line Options

When running `iv` from the command line, you can use the following parameters:

<code>-help</code>	Lists available command line options.
<code>-gamma <n></code>	Sets the default gamma for images. If this parameter is omitted, the default for the system (usually 1.0 for Linux and 2.2 for Windows) is used. The default can be overridden on a per-image basis.
<code>-nosort</code>	Tells <code>iv</code> to load the images in the exact order they are listed on the command line. Without this parameter, <code>iv</code> will sort the images to be loaded so that frame numbers are sequential, e.g., <code>foo.9.tif</code> , <code>foo.10.tif</code> , <code>foo.11.tif</code> .
<code>-fullscreen</code>	Launches <code>iv</code> in fullscreen mode
<code>-zoom <level></code>	Starts <code>iv</code> at a particular level of zoom, ranging from -4 to 4. If this parameter is not given, <code>iv</code> launches at level 0. Each level doubles in scale, so 1 is double-sized, 2 is quadrupled, -1 is half size, etc.
<code>-expand</code>	Causes <code>iv</code> to automatically expand its size when an image is loaded or switched to, if that image is larger than the current window size. By default, this feature is off, meaning that the window size will remain the size of the first image loaded during the <code>iv</code> session, unless the user takes an action to resize the window.
<code>-play <n></code>	Starts <code>iv</code> in flipbook mode at the specified frames per second. Note that <code>n</code> is a floating point number, and may be less than 1 (e.g., <code>-play 0.1</code> will display frames for 10 seconds each).
<code>-loop <n></code>	Used in conjunction with the <code>-play n</code> parameter, this instructs <code>iv</code> to play the flipbook <code>n</code> times and then exit.
<code>-F</code>	Runs <code>iv</code> in the foreground instead of automatically forking and killing the parent process. By default, <code>iv</code> will run in the background so that you can view the file and continue to use the shell. This parameter is used primarily for debugging and in normal usage will not be needed.
<code>-verbosity <n></code>	Controls the amount of message traffic generated by a Gelato render. <code>n</code> can be assigned one of three values. 0 reports errors only. 1 (the default) also prints warnings. 2 provides additional debugging information; used primarily for debugging image I/O plug-ins, where you want to set verbosity to 2
<code>-debugdso</code>	Outputs information about all DSO/DLL loads, useful in debugging why image I/O plug-ins are not being found; used primarily for debugging image I/O plug-ins

Configuration

Configuration File

`iv` reads a configuration file stored in `$HOME/.ivrc` on startup. The file syntax is to have a single assignment statement on each line. Blank lines are fine, and comment lines begin with a hash mark. This file can contain any of the following user preferences:

<code>gamma = %f</code>	The default gamma value used for all image types unless otherwise specified on the command line or with one of the image-specific gammasettings.
<code>gamma.extension=%f</code>	Type-specific gamma value. For example, you can set the gamma used just for TIFF files using: <code>gamma.tif=2.2</code>
<code>save_image_filename=%s</code>	This preference allows you to change the filename used to save images with <code>Ctrl-S</code> from the default value of <code>"/tmp/iv.tif"</code> .
<code>save_window_filename=%s</code>	This preference allows you to change the filename used to save the current window view with <code>Shift-Ctrl-S</code> from the default value of <code>"/tmp/ivfb.tif"</code> .
<code>background=%f</code>	Set the default background gray value used whenever the current image is smaller than the active window.
<code>sort=%d</code>	A zero value will disable the image filename sorting done by default at startup. Setting this to zero is the same as using the <code>-nosort</code> command line option.
<code>autozoom=%d</code>	A value of zero will disable the autozoom feature which scales down images that are too large to fit on the screen at startup.
<code>fullscreen=%d</code>	A nonzero value will force <code>ivbinary</code> to startup in fullscreen mode, as if <code>-fullscreen</code> was passed on the command line.
<code>expand_to_fit=%d</code>	A nonzero value will cause the display window to resize when larger images are displayed if the window is not already large enough, as if <code>-expand</code> was passed on the command line.
<code>MainWindow.x=%d</code> <code>MainWindow.y=%d</code>	Set the default startup position of the display window (default is 0,0).

Here is an example configuration file:

```
# Example configuration file for iv

# You can set a different gamma value for each image type
# using the syntax "gamma.<extension>". Images sent from
# gelato currently do not have an associated image type,
# and instead use the global gamma setting which come
# from the "gamma" value below, or the command line
gamma = 2.2
gamma.jpg = 1.0
gamma.tif = 2.2

# Set the name of the save and savewindow filenames
save_image_filename = /home/dwexler/iv.tif
save_window_filename = /home/dwexler/ivfb.jpg

# You can change your background color with this:
background = 0.5

# This disables sorting of input images if set to zero
#sort = 1

# This disables the autozooming of large images if
# set to zero
autozoom = 1
```

Environment Variables

iv's behavior is influenced by the following environment variables of the command shell:

GAMMA Gives the default gamma correction to use when displaying files (default is 1.0). This may be overridden by the configuration file or the command-line `-gamma` option.

As a reminder, below we show how to set the **GAMMA** environment variable to 2.2 using a variety of shells:

csh, tcsh: `setenv GAMMA 2.2`

ksh, bash: `export GAMMA=2.2`

Tips

- `iv` can read TIFF images that `gelato` is still in the middle of rendering, though it will only display the portion that has thus far been saved to the image file. But hitting `ENTER` periodically will make `iv` reread the file and display the newly rendered portion.
- Except when using the `-nosort` option, `iv` is smart about typical ways of naming consecutive frames of an animation. Images numbered like `f.8.tif`, `f.9.tif`, `f.10.tif` will load in the proper order into `iv` for flipbook playback, even though standard alphanumeric sorting would put them in the wrong order. So, if you have all your frames in a single directory, you can use `\ivbinary` as a flipbook with the command

```
iv -fps 24 *
```

- `iv` can be used to display a "slide show" for still images by giving it a sequence of images and telling it a very low frames per second. For example,

```
iv -fullscreen -play 0.1 -loop 2 slide*.tif
```

will loop through all the TIFF files twice, displaying each image full screen for 10 seconds.

- Use copy and paste between separate `\ivbinary` windows to compare nonconsecutive renders. After pasting, try toggling ('t') or wiping ('Control+Left') between the two images to look for differences. Setting random colors ('x') will make the image confusing, but makes it easy to see even single pixel differences.
- `iv` will display error messages in the top left portion of the window. These messages remain for a specified minimum period of time and then disappear the next time the image is repainted.
- When creating a demo, try using the `-fullscreen` and `-zoom` options for the `\ivbinary` output `imageio` DSO.

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