GIMP Glossary

Glossary

- *Alpha -*

  An alpha value indicates the tranparency of a pixel. A pixel with an alpha value of 0 is completely transparent. A pixel value of 255 is fully opaque.

- *Alpha Channel -*

  A grayscale image of the same size as the layer representing its transparency. For each pixel the gray level (a value between 0 and 255) represents the pixels's Alpha value.

- *Antialiasing -*

  The process of reversing an alias, that is, reducing the "jaggies". Antialiasing produces smoother curves by adjusting the boundary between the background and the pixel region that is being antialiased.

- *Bezier Curve -*

  A spline is a curve which is defined mathematically and has a set of control points. A Bézier spline is a cubic spline which has four control points, where the first and last control points (knots or anchors) are the endpoints of the curve and the inner two control points (handles) determine the direction of the curve at the endpoints.

- *BItmap -*

  A data file or structure which corresponds bit for bit with an image displayed on a screen, probably in the same format as it would be stored in the display's video memory or maybe as a device independent bitmap.

- *BMP -*

  An uncompressed image file format designed by Microsoft and mainly used in Windows. Colors are typically represented in 1, 4 or 8 bits, although the format also supports more. Because it is not compressed and the files are large, it is not very well suited for use in the internet.

- *Bump Mapping -*

  A technique for displaying extremely detailed objects without increasing the geometrical complexity of the objects. It is especially used in 3-dimensional visualization programs.

- *Channel -*

  A channel refers to a certain component of an image. Every channel is a grayscale image of exactly the same size as the image and, consequently, consists of the same number of pixels. Every pixel of this grayscale image can be regarded as a container which can be filled with a value ranging from 0 to 255.

- *Channel Encoding -*

  Refers to how fast the intensity (more technically correct for grayscale and RGB images, the relative Luminance) of a channel in a digital image progresses from dark to light as the channel values progress from 0.0 to 1.0 floating point (0 to 255 for 8-bit integer, 0 to 65535 for 16-bit integer).

The linear light channel encoding reflects the way lightwaves combine there in the real world.

Two different channel encodings are used internally in GIMP for various editing operations, these being "Linear light" and "Non-linear" (previously known as Perceptual gamma (sRGB)).

- *Clipboard -*
  A temporary area of memory which is used to transfer data between applications or documents. It is used when you Cut, Copy or Paste data in GIMP.

  GIMP makes an intelligent decision about what to paste depending upon the target. If the target is a canvas, the Paste operation uses the image clipboard. If the target is a text entry box, the paste operation uses the text clipboard.

- *CMY, CMYK -*
  A color model which has components for Cyan, Magenta, Yellow and Black. It is a subtractive color model, and that fact is important when an image is printed.

- *Color -*
  On the one hand, light comes from the sun or other radiant sources, and is refracted by mediums (water, the atmosphere, glass) and diffusely or specularly reflected by surfaces.

  On the other hand, color isn't out there in the world in the same tangible way that light is. Rather color is part of how we sense the world around us. Light enters the eyes, is processed by light receptors (cones and rods), and sent via the optic nerves to the brain for further processing and interpretation.

  Light varies in wavelengths, which our eyes and brain interpret as varying hues (reds, blues, greens, and so on), and also in intensity (aka "luminance"). So our perception of color is composed of both intensity ("luminance") information and chromaticity information.

- *Color Depth -*
  The number of bits used to represent a color (bits per pixel : bpp). There are 3 channels for a pixel (for Red, Green and Blue). GIMP can support 8 bits per channel, referred as eight-bit color. So, GIMP color depth is 8 * 3 = 24, which allows 256 * 256 * 256 = 16,777,216 possible colors (8 bits allow 256 colors).

- *Color Model -*
  A way of describing and specifying a color. The term is often used loosely to refer to both a color space system and the color space on which it is based.

A color space is a set of colors which can be displayed or recognized by an input or output device (such as a scanner, monitor, printer, etc.). The colors of a color space are specified as values in a color space system, which is a coordinate system in which the individual colors are described by coordinate values on various axes.

- *Display-referred -*

  Refers to images that can be displayed (either directly or by means of ICC profile color management) on devices. The displaying device might be a monitor, or an image printed on paper, or some other display technology.

Regardless of the technology, when you display an image on a device, that device has a maximum and minimum brightness. The maximum and minimum brightnesses are referred to as display-referred white and display-referred black.

- *Display-referred Black -*

  The floating point RGB color (0.0, 0.0, 0.0) and its integer equivalents. This color has the very special significance that there's no such thing as "less bright than black". So in display-referred image editing, all RGB channel values are greater than or equal to 0.0 and no color is less bright than "black", (0.0, 0.0, 0.0).

- *Display-referrred White -*

  The floating point RGB color (1.0, 1.0, 1.0) and the integer equivalents (255,255,255), (65535,65535,65535), etc, for 8-bit integer, 16-bit integer, etc.

"Display-referred white" has the very special significance that in display-referred editing there's no such thing as "brighter than white". So in display-referred image editing, all RGB channel values are less than or equal to 1.0 and no color is brighter than "white", (1.0, 1.0, 1.0).

- *Dithering -*

  A technique used in computer graphics to create the illusion of more colors when displaying an image which has a low color depth. In a dithered image, the missing colors are reproduced by a certain arrangement of pixels in the available colors.

- *EXIF -*

  Exchangeable image file format (official abbreviation Exif, not EXIF) is a specification for the image file format used by digital cameras.

- *Feathering -*

  The process of Feathering makes a smooth transition between a region and the background by softly blending the edges of the region.

- *File Format -*

  The form in which computer data is stored. The best file format for saving an image depends upon how the image is intended to be used.

- *Floating Selection -*

  A floating selection (sometimes called a "floating layer") is a type of temporary layer which is similar

in function to a normal layer, except that a floating selection must be anchored before you can resume working on any other layers in the image.

- *Floyd-Steinberg Dithering -*
  The dithering process begins in the upper left corner of the image. For each pixel, the closest available color in the palette is chosen and the difference between that color and the original color is computed in each RGB channel. Then specific fractions of these differences are dispersed among several adjacent pixels which haven't yet been visited (below and to the right of the original pixel). Because of the order of processing, the procedure can be done in a single pass over the image.

- *Gamma -*
  Gamma or gamma correction is a non-linear operation which is used to encode and decode luminance or color values in video or still image systems. It is used in many types of imaging systems to straighten out a curved signal-to-light or intensity-to-signal response. For example, the light emitted by a CRT is not linear with regard to its input voltage, and the voltage from an electric camera is not linear with regard to the intensity (power) of the light in the scene. Gamma encoding helps to map the data into a perceptually linear domain, so that the limited signal range (the limited number of bits in each RGB signal) is better optimized perceptually.

- *Gamut -*
  In color reproduction, including computer graphics and photography, the gamut, or color gamut (pronounced /ˈgæmət/), is a certain complete subset of colors. The most common usage refers to the subset of colors which can be accurately represented in a given circumstance, such as within a given color space or by a certain output device. Another sense, less frequently used but not less correct, refers to the complete set of colors found within an image at a given time.

- *GIF -*
  GIF™ stands for Graphics Interchange Format. It is a file format with good, lossless compression for images with low color depth (up to 256 different colors per image). Since GIF was developed, a new format called Portable Network Graphics (PNG) has been developed, which is better than GIF in all respects, with the exception of animations and some rarely-used features.

- *GNU -*
  The GNU project was started in 1983 by Richard Stallman with the goal of developing a completely free operating system. It is especially well-known from the GNU General Public License (GPL) and GNU/Linux, a GNU-variant with a Linux kernel. Since the new system was to be based on the widespread operating system, Unix, Stallman looked for that kind of name and came up with GNU, which stands for "GNU is not Unix".

- *Grayscale -*
  Grayscale is a mode for encoding the colors of an image which contains only black, white and shades of gray.

- *Guides -*
  Guides are lines you can temporarily display on an image while you are working on it. You can display as many guides as you would like, in either the horizontal or the vertical direction. These lines help you position a selection or a layer on the image. They do not appear when the image is printed.

- *High Dynamic Range -*
  With display-referred data you have roughly two and half stops of head room above middle gray and maybe six and a half usable stops below middle gray, at which point the data is too densely packed into too few tonal steps to accurately display differences between solid black and "just barely gray". So at best you have 9 stops of dynamic range, compared to the 20 or more stops of dynamic range you might find in some (certainly not all!) real world scenes.

  The usual solution to the dynamic range limitations of display-referred data is to allow channel values to be however high as is needed to encode the scene data. This means allowing channel values that are above display-referred white.

  Several file formats supported by GIMP can be used to import and export high dynamic range images, including floating point tiffs, OpenEXR, and FITS.

  When working with high dynamic range data, the channel encoding does need to be linear to avoid gamma artifacts.

  Editing high dynamic range data requires that there isn't any clamping code in editing operations and blend modes.
- *Histogram -*
  In digital image processing, a histogram is a graph representing the statistical frequency of the gray values or the color values in an image. The histogram of an image tells you about the occurrence of gray values or color values, as well as the contrast range and the brightness of the image. In a color image, you can create one histogram with information about all possible colors, or three histograms for the individual color channels. The latter makes the most sense, since most procedures are based on grayscale images and therefore further processing is immediately possible.
- *HSV -*
  HSV is a color model which has components for Hue (the color, such as blue or red), Saturation (how strong the color is) and Value (the brightness).
  - *Hue -*
    This is the color itself, which results from the combination of primary colors. All shades (except for the gray levels) are represented in a chromatic circle: yellow, blue, and also purple, orange, etc. The chromatic circle (or "color wheel") values range between 0° and 360°.
  - *Saturation -*
    This value describes how pale the color is. A completely unsaturated color is a shade of gray. As the saturation increases, the color becomes a pastel shade. A completely saturated color is pure. Saturation values go from 0 to 100, from white to the purest color.

- *Value* -

  This value describes the luminosity, the luminous intensity. It is the amount of light emitted by a color. You can see a change of luminosity when a colored object is moved from being in the shadow to being in the sun, or when you increase the luminosity of your screen. Values go from 0 to 100. Pixel values in the three channels are also luminosities: "Value" in the HSV color model is the maximum of these elementary values in the RGB space (scaled to 0-100).

- *HTML Notation* -

  A hex triplet is a way of encoding a color for a computer. The "#" symbol indicates that the numbers which follow it are encoded in hexadecimal. Each color is specified in two hexadecimal digits which make up a triplet (three pairs) of hexadecimal values in the form "#rrggbb", where "rr" represents red, "gg" represents green and "bb" represents blue.

- *Image Hose* -

  An image hose in GIMP is a special type of brush which consists of several images. For example, you could have a brush with footprints, which consists of two images, one for the left footprint and one for the right. While painting with this brush, a left footprint would appear first, then a right footprint, then a left one, etc. This type of brush is very powerful. An image hose is also sometimes called an "image pipe" or "animated brush".

- *Incremental, Paint Mode* -

  Incremental mode is a paint mode where each brush stroke is drawn directly on the active layer. When it is set, each additional stroke of the brush increases the effect of the brush, up to the maximum opacity for the brush.

- *Indexed Colors* -

  Indexed color mode is a mode for encoding colors in an image where each pixel in the image is assigned an 8-bit color number. The color which corresponds to this number is then put in a table (the palette). Changing a color in the palette changes all the pixels which refer to this palette color. Although you can create images in Indexed Color mode and can transform images to it, it is, strictly speaking, not a color model.

- *Interpolation* -

  Interpolation means calculating intermediate values. When you enlarge ("digitally zoom") or otherwise transform (rotate, shear or give perspective to) a digital image, interpolation procedures are used to compute the colors of the pixels in the transformed image.

- *IPTC* -

  IPTC is an acronym for International Press Telecommunications Council which developed the Information Interchange Model (IIM) for text, image and other media types metadata.

- *JPEG* -

  JPEG is a file format which supports compression and works at all color depths. The image compression is adjustable, but beware: Too high a compression could severely reduce image quality, since JPEG compression is lossy.

  Use JPEG to create web graphics or if you don't want your image to take up a lot of space.

- *Lab -**

  The Lab color space (also called the L*ab** color space) is a color model developed in the beginning of the 1930s by the Commission Internationale d`Eclairage (CIE). It includes all the colors that the human eye can perceive. That contains the colors of the RGB and the CMYK color spaces, among others. In Lab, a color is indicated by three values: L, a and b. Here, the L stands for the luminance component — corresponding to the gray value — and a and b represent the red-green and blue-yellow parts of the color, respectively.

- *Layer -*

  You can think of layers as being a stack of slides which are more or less transparent. Each layer represents an aspect of the image and the image is the sum of all of these aspects. The layer at the bottom of the stack is the background layer. The layers above it are the components of the foreground.

- *Marching Ants -*

  Marching ants is a term which describes the dotted line which surrounds a selection. The line is animated, so it looks as if little ants are running around behind each other.

- *Masks -*

  A mask is like a veil put over a layer (layer mask) or all the layers of an image (selection mask). You can remove this mask by painting with white color, and you can complete it by painting with black color. When the mask is "applied", non masked pixels will remain visible (the others will be transparent) or will be selected, according to the type of mask.

  - *Layer Mask -*

    Every layer can have its own mask. The layer mask represents the Alpha channel of the layer and allows you to manage its transparency. By painting on the layer mask, you can make parts of the layer opaque or transparent: painting with black makes the layer transparent, painting with white makes the layer opaque and painting with shades of gray makes the layer semi-transparent. You can use all paint tools to paint on the mask. You can also apply a filter or copy-paste. You can use the Layer mask for transition effects, volume effects, merging elements from another image, etc.

  - *Channel Mask -*

    Channel Mask, also called Selection Mask: Channel Masks determine the transparency of a selection. By painting on a Channel Mask with white, you remove the mask and increase the selection; with black, you reduce the selection. This procedure lets you create a selection very precisely. You can also save your selections to a Channel Mask with the Save to Channel command. You can retrieve it later by using the "Channel to selection" command from the Channel menu. Channel masks are so important in GIMP that a special type has been implemented: the Quick mask.

- *Moiré Effect -*

  The moiré effect (pronounce "Moa-ray") is an unintended pattern which appears when a regular pattern of grids or lines interferes with another regular pattern placed over it. This can happen, for example, when you are scanning an image with a periodic structure (such as a checkered shirt or a

half-toned image), scanning a digital image, taking a digital photograph of a periodic pattern, or even when silkscreening.

- *Parasite -*

  A Parasite is additional data which may be written to an XCF file. A parasite is identified by a name, and can be thought of as an extension to the other information in an XCF file.

- *Pass-Through -*

  Layer groups using Pass-through mode are different: the layers inside them "see" the layers below the group, and interact with them according to their layer mode.

- *Path -*

  A Path is a contour composed of straight lines, curves, or both. In GIMP, it is used to form the boundary of a selection, or to be stroked to create visible marks on an image. Unless a path is stroked, it is not visible when the image is printed and it is not saved when the image is written to a file (unless you use XCF format).

- *PDB -*

  All of the functions which GIMP and its plug-ins make available are registered in the Procedure Database (PDB). Developers can look up useful programming information about these functions in the PDB by using the Procedure Browser.

- *PDF -*

  PDF (Portable Document Format) is a file format which was developed by Adobe to address some of the deficiencies of PostScript. Most importantly, PDF files tend to be much smaller than equivalent PostScript files. As with PostScript, GIMP's support of the PDF format is through the free Ghostscript libraries.

- *Pixel -*

  A pixel is a single dot, or "picture element", of an image. A rectangular image may be composed of thousands of pixels, each representing the color of the image at a given location. The value of a pixel typically consists of several Channels, such as the Red, Green and Blue components of its color, and sometimes its Alpha (transparency).

- *Plug-in -*

  Plug-ins are external programs that run under the control of the main GIMP application and provide specific functions on-demand.

- *PNG -*

  PNG is the acronym of "Portable Network Graphic" (pronounce "ping". This recent format offers many advantages and a few drawbacks: it is not lossy and gives files more heavy than the JPEG format, but it is perfect for saving your images because you can save them several times without losing data each time (it is used for this Help). It supports True Colors (several millions of colors), indexed images (256 colors like GIF), and 256 transparency levels (while GIF supports only two levels).

- *PostScript -*

  Created by Adobe, PostScript is a page description language mainly used by printers and other output devices. It's also an excellent way to distribute documents. GIMP does not support PostScript directly: it depends on a powerful free software program called Ghostscript.

- *PSD -*
  PSD is Adobe Photoshop's native file format, and it is therefore comparable to XCF in complexity. GIMP's ability to handle PSD files is sophisticated but not perfect: some features of PSD files are not loaded or may look slightly different. Although there is an online specification, it does not cover all details, which makes it difficult to support all features of PSD files.

- Quantization -*
  Quantization is the process of reducing the color of a pixel into one of a number of fixed values by matching the color to the nearest color in the colormap. Actual pixel values may have far more precision than the discrete levels which can be displayed by a digital display. If the display range is too small, then abrupt changes in colors (false contours, or banding) may appear where the color intensity changes from one level to another. This is especially noticeable in Indexed images, which have 256 or fewer discrete colors.

- *Rendering Intent -*
  Rendering intents are ways of dealing with colors that are out-of- Gamut colors present in the source space that the destination space is incapable of producing. There are four rendering intents defined by the ICC:

  - *Perceptual -*
    This rendering intent is typically used for photographic content. It scales one gamut to fit into the other while maintaining the relative position of colors.

  - *Relative Colorimetric -*
    This rendering intent is typically used for spot colors. Colors that are not out of gamut are left unchanged. Colors outside the gamut are converted to colors with the same lightness, but different saturation, at the edge of the gamut.

  - *Saturation -*
    This method is typically used for business graphics. The relative saturation of colors is mostly maintained, but lightning is usually changed.

  - *Absolute colorimetric -*
    This rendering intent is most often used in proofing. It preserves the native device white point of the source image.

- *RGB -*
  RGB is a color model which has components for Red, Green and Blue. These colors are emitted by screen elements and not reflected as they are with paint. The resulting color is a combination of the three primary RGB colors, with different degrees of lightness. The RGB color model is additive.

- *Sample Merged -*
  Sample Merged is an option you can set when you use the Bucket Fill tool, the Color Picker tool and various selection tools. It is useful when you are working on an image with several layers and the active layer is either semi-transparent or has a Layer Mode which is not set to Normal. When you check the Sample Merged option, the color which is used for the operation is the composite color of all the visible layers. When the Sample Merged option is not checked, the color used is the color of the active layer itself.

- *Saturation -*

  This term refers to color purity.

- *Scene-Referred -*

  When speaking of images captured by a camera, scene-referred means that the intensities in the image RGB channels are proportional to the intensities in the scene that was photographed.

- *Supersampling -*

  A more sophisticated antialiasing technique. Samples are taken at several locations within each pixel, not just at the center, and an average color is calculated. This is done by rendering the image at a much higher resolution than the one being displayed and then shrinking it to the desired size, using the extra pixels for calculation. The result is a smoother transition from one line of pixels to another along the edges of objects.

- *SVG -*

  SVG stands for Scalable Vector Graphics. It is a format for two-dimensional vector graphics, both static and animated.

- *TGA -*

  TGA (TARGA Image File) is a file format which supports 8, 16, 24 or 32 bits per pixel and optional RLE compression. It was originally developed by the Truevision company. "TGA" stands for Truevision Graphics Adapter and "TARGA" stands for Truevision Advanced Raster Graphics Adapter.

- *TIFF -*

  TIFF (Tagged Image File Format) is a file format which was developed primarily for scanned raster graphics for color separation. Six different encoding routines are supported, each with one of three different image modes: black and white, grayscale and color. Uncompressed TIFF images may be 1, 4, 8 or 24 bits per pixel. TIFF images compressed using the LZW algorithm may be 6, 8 or 24 bits per pixel. Besides PostScript format, TIFF is one of the most important formats for preliminary stages of printing. It is a high quality file format, which is perfect for images you want to import to other programs like FrameMaker or CorelDRAW.

- *Tile -*

  A Tile is a part of an image which GIMP currently has open. In order to avoid having to store an entire image in memory at the same time, GIMP divides it into smaller pieces. A tile is usually a square of 64×64 pixels, although tiles at the edges of an image may be smaller than that.

- *URI -*

  A Uniform Resource Identifier (URI) is a string of characters that serves to identify an abstract or a physical resource. URIs are used for the identification of resources in the Internet (such as web pages, miscellaneous files, calling up web services, and for receivers of e-mail) and they are especially used in the Worldwide Web.

- *URL -*

  URLs (Uniform Resource Locators) are one type of Uniform Resource Identifiers (URIs). URLs identify a resource by its primary access mechanism (commonly http or ftp) and the location of the resource in the computer network. The name of the URI scheme is therefore generally derived from the network protocol used for it.

- *Value -*
  This term often refers to the light intensity, the luminosity of a color. It varies from 0 (black) to 100 (full light).

- *XCF -*
  XCF is a file format which is special because it is GIMP's native file format: that is, it was designed specifically to store all of the data that goes to make up a GIMP image. Because of this, XCF files may be quite complicated, and there are few programs other than GIMP that can read them.

  When an image is stored as an XCF file, the file encodes nearly everything there is to know about the image: the pixel data for each of the layers, the current selection, additional channels if there are any, paths if there are any, and guides. The most important thing that is not saved in an XCF file is the undo history.

  The pixel data in an XCF file is represented in a lossless compressed form: the image byte blocks are compressed using the lossless RLE algorithm. This means that no matter how many times you load and save an image using this format, not a single pixel or other image data is lost or modified because of this format. XCF files can become very large, however GIMP allows you to compress the files themselves, using either the gzip or bzip2 compression methods, both of which are fast, efficient, and freely available. Compressing an XCF file will often shrink it by a factor of 10 or more.

- *XDG -*
  Freedesktop.org (also called XDG) is a project to work on interoperability among desktop environments on Linux and Unix-like operating systems.

  Such operating systems usually include software which implements XDG specifications to allow an application to open other applications, such as a web browser, an email client, or software to take screenshots.

- *XMP -*
  XMP is an acronym for Extensible Metadata Platform. It is a metadata format based on XML used in PDF and photographs.

- *YCbCr -*
  The YCbCr model is a slight adaptation of such a brightness-color model. An RGB color value is divided into a basic brightness, Y, and two components, Cb and Cr, where Cb is a measurement of the deviation from gray in the blue direction, or if it is less than 0.5, in the direction of yellow. Cr is the corresponding measurement for the difference in the direction of red or turquoise. This representation uses the peculiarity of the eye of being especially sensitive to green light. That is why most of the information about the proportion of green is in the basic brightness, Y, and only the deviations for the red and blue portions need to be represented. The Y values have twice the resolution of the other two values, Cb and Cr, in most practical applications, such as on DVDs.

- *YUV -*

  YUV is a color model which uses two components to represent the color information, luma (the strength of the light per area) and the chrominance, or proportion of color (chroma), where the chrominance again consists of two components.

  Furthermore, because of the structure of the retina of the human eye, it turns out that the brightness information is perceived at a higher resolution than the color, so that many formats based on the YUV color model compress the chrominance to save bandwidth during transmission.