

GIMP (short for the GNU Image Manipulation Program) is a free software raster graphics editor. It is primarily employed as an image retouching and editing tool. In addition to free-form drawing, GIMP can accomplish essential image work-flow steps such as resizing, editing, and cropping photos, combining multiple images, and converting between different image formats. GIMP can also be used to create basic animated images in the GIF format. At present, GIMP is usable for amateur or professional work with images intended for viewing on monitors and printing on ink-jet printers.

The product vision for GIMP is to become a high-end graphics application for the editing and creation of original images, icons, graphical elements of web pages and art for user interface elements. One point in GIMP's product vision would see GIMP used for the development of cutting-edge image-processing algorithms.

Features:

Tools used to manipulate images can be accessed via the toolbox, through menus and dialogue windows. They include filters and brushes, as well as transformation, selection, layer and masking tools.

- **Color:** GIMP has several ways of selecting colors including palettes, color choosers and using an eyedropper tool to select a color on the canvas. The built in color choosers include RGB/HSV selector or scales, water-color selector, CMYK (cyan, magenta, yellow, key (black)) selector and a color-wheel selector. Colors can also be selected using hexadecimal color codes as used in HTML color selection. GIMP has native support for indexed color and RGB color spaces, other color spaces are supported using decomposition where each channel of the new color space becomes a black and white image. CMYK, LAB and HSV (hue, saturation, value) are supported this way.[24][25] Color blending can be achieved using the blend tool, by applying a gradient to the surface of an image and using GIMP's color modes. Gradients are also integrated into tools such as the brush tool, when the user paints this way the output color slowly changes. There are a number of default gradients included with GIMP, a user can also create custom gradients with tools provided.
- **Selections and paths:** in GIMP there are several tools that can be used to create selections including a rectangular and circular selection tool, free select tool, and fuzzy select tool (also known as magic wand). More advanced selection tools include the select by color tool for selecting contiguous regions of color and the scissors select tool which creates selections semi-automatically between areas of highly contrasting colors. GIMP also supports a quick mask mode where a user can use a brush to paint the area of a selection, visibly this looks like a red colored overlay being added or removed. The foreground select tool is an implementation of Simple Interactive Object Extraction (SIOX) a method used to perform the extraction of foreground elements, such as a person or a tree in focus. The Paths Tool allows a user to create vectors (also known as Bézier curves). Paths can be used to create complex selections around natural curves, paths can also be named, saved, and painted (or "stroked") with brushes, patterns, or various line styles.
- **Image editing:** there are many tools that can be used for editing images in GIMP. The more common tools include a paint brush, pencil, airbrush, eraser and ink tools used to create new or blended pixels. Tools such as the bucket fill and blend tools are used to change large regions of space in an image and can be used to help blend images. GIMP also has a selection of smart tools, which are tools that use a more complex algorithm to enable a user to do things that otherwise would be time consuming or impossible; these smart tools include the clone tool that copies pixels using a brush, the healing brush which copies pixels from an area and corrects the tone and color where it is being used. The perspective clone tool works in a similar way to the clone tool previously mentioned but also allows a user to correct for distance changes. The blur and sharpen tool is a brush that blurs and sharpens. Finally the dodge and burn tool is a brush that makes target pixels lighter (dodges) or darker (burns).

A list of GIMP transform tools include the align tool, move, crop, rotate, scale, shear, perspective and flit tools.

- **Layers, layer masks and channels:** an image being edited in GIMP can consist of many layers sitting in a

stack. The GIMP user manual suggests that "A good way to visualize a GIMP image is as a stack of transparencies" where in GIMP terminology each transparency is a layer.[26] Each layer in an image is made up of several channels. In an RGB image there are normally 3 or 4 channels, each consisting of a red, green and blue channel. Color sublayers look like slightly different gray images, but when put together they make a complete image. The fourth channel that may be part of a layer is the alpha channel (or layer mask), this channel measures opacity where a whole or part of an image can be completely visible, partially visible or invisible.

Text layers can be created using the text tool, allowing a user to write on an image. Text layers can be transformed in several ways, such as converting it to a path or selection.

- Automation, scripts and plug-ins: GIMP has approximately 150 standard effects and filters, including Drop Shadow, Blur, Motion blur and Noise.

GIMP operations can be automated with scripting languages. The Script-Fu is a Scheme based extension language implemented using TinyScheme, GIMP can also be scripted in Perl, Python (Python-fu), or Tcl.

GIMP has support for several methods of sharpening and blurring images including the blur and sharpen tool. The unsharp mask tool is used to sharpen an image selectively - it only sharpens areas of an image that are sufficiently detailed. The unsharp mask tool is considered to give more targeted results for photographs than a normal sharpening filter.

The Selective Gaussian Blur tool works in a similar way, except it blurs areas of an image with little detail.

- **GEGL:** The Generic Graphics Library (GEGL) was first introduced as part of GIMP on the 2.6 release of GIMP. This initial introduction does not yet exploit all of the capabilities of GEGL; as of the 2.6 release GIMP can use GEGL to perform high bit depth color operations, because of this less information is lost when performing color operations. When fully integrated, GEGL will allow GIMP to have a higher color bit depth and also a better non-destructive work-flow.
- **File formats:** GIMP supports saving and loading a large number of different file formats, GIMP's native format XCF is designed to store an image including all features specific to GIMP such as layers, channels and vectors; XCF is named after the eXperimental Computing Facility where GIMP was authored.