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Easy graphic masking and extraction with SIOX

EASY MASK

SIOX easily masks and extracts any area from a pixel graphic. We'll show you how to improve your pictures with this powerful plugin.

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Part of the daily grind for people who edit digital photos includes masking and extracting image elements. Image extraction lets you improve the brightness, contrast, or color of an individual element without changing the rest of the picture. Artists also use masking and extraction tools to compose collages and add graphic features to documents.

Masking

In the days before digital photography, masking entailed working with cardboard templates that covered or exposed different parts of the image. The principle remains unchanged in digital photography; however, the digital age has added new options for masking and extracting images. Masking isn't always easy, though; in fact, it can be downright frustrating. For instance, if you are masking an object with a diffuse border, the results are often less than ideal.

A new generation of tools promises to make masking simpler and more reliable. One of these tools is SIOX (Simple Interactive Object Extraction), a develop-

ment from the Center for Digital Media at the Free University of Berlin, Germany [1]. SIOX lets you roughly mark an object and then lift it off the background. The tool is available as a plugin for Inkscape and GIMP 2.2 or newer.

Setting Up SIOX

To use SIOX in GIMP 2.2 or newer, first download the pre-built binary from the project homepage; the *siox4gimp* binary is located in the *Plugin for GIMP 2.2* section. Copy the file to *.gimp-2.2/plugin-ins* in your home directory (or to */usr/lib/gimp/2.0/plugin-ins* for a global installation). If you like, you can type `sudo chmod a+x siox4gimp` – or use an equivalent file manager function – to let GIMP automatically bind the plugin next launch time.

If you will be using SIOX with the Inkscape vector graphic program, you don't need to do anything; SIOX is included with the current version of the program.

Image Prerequisites

SIOX will work with any RGB(A) image, that is, with any graphic that uses the

RGB colorspace plus the alpha channel for transparency; you cannot use SIOX with grayscale images.

Graphics with indexed colors, such as web-optimized GIFs, have to be converted to RGB before masking with SIOX. To do this in GIMP, click *Image | Mode* and then select *RGB*.

SIOX with Inkscape

Users with version 0.44 or newer of the the GPL vector drawing program Inkscape have it easier – SIOX is part of the *Trace Bitmap* function, which is available via the *Path* menu or the keyboard shortcut Shift + Alt + B. When you get there, enable the option *SIOX foreground selection* (Figure 1).

As the function name suggests, Inkscape does not use SIOX to mask individual parts of an image for ongoing processing. Converting pixel-oriented images to a vector format is the objective of tracing bitmaps. In contrast to pixel graphics [2], vector graphics can be scaled or manipulated without compromising image information [3].

To extract an object using SIOX, first

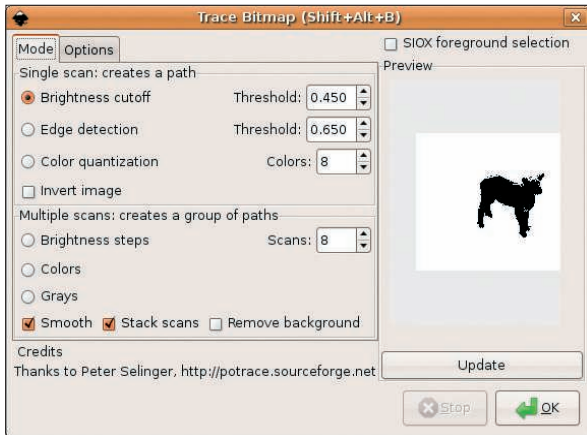


Figure 1: The Inkscape vector drawing program includes SIOX. The plugin is part of the Trace Bitmap function.

load a bitmap into the workspace with *File | Import*. Pressing F4 enables the *Rectangle tool*, which is then available in the toolbox on the left of the screen. Using the rectangle tool, drag a frame over the object you want to extract. Pressing Ctrl + A selects the object and the frame.

Select *Path* and pop up the *Trace Bitmap* toolbox, where you can set the sensitivity of the extraction tool. To do so, enable one of the options below *Single Scan: creates a path* and adjust the threshold values or colors. To see how these settings affect the image, just click *Update*. *OK* applies your selections. The toolbox window stays open, but you can press the "x" in the upper right corner to close it.

You will see a smaller selection behind the rectangle in the image. The selection precisely covers the contour of the extracted object, but it is hidden behind the rectangle. Pressing Ctrl + C copies this selection to the clipboard, and you can then press Ctrl + V to insert the graphic at another position.

SIOX in GIMP

GIMP versions prior to 2.3 support the extraction tool as a plugin only, whereas the latest version (2.4) has an addi-

tional SIOX foreground extraction tool.

To use the extraction tool as a plugin, load a graphic, then right-click on the image and select *Filter | Misc | Foreground Extraction*. This takes you to a workspace where you can select critical areas in three steps.

Start by roughly marking the foreground area you will be extracting (Figure 2). To do so, hold down the left mouse button and drag a rectangle

over the image. Try to mark as much of the foreground and as little of the background as possible. A red selection triangle now appears in the image. Clicking *Apply Selection* selects the element, or click *Reset Selection* to discard the selection and start again. In both cases, the selection disappears.

Now revise the foreground selection (Figure 3). Again, you need to hold down the left mouse button and drag the mouse to draw a turquoise rectangle. When you are done, press *Apply Selection* or enter *Reset Selection* to restart.

In this step, make sure you do not select any part of the background. Repeat this step as often as necessary, until you are sure you have selected all the critical parts of the object.

Experiment

Now it's time to experiment. The best results are obtained by enabling SIOX's advanced options to improve edge sensitivity or intensify the SIOX plugin's reaction to brightness or specific colors. Unlike Inkscape, you do not get to see a preview of the results before clicking *OK* to start extracting. In other words, you choose your weapons, press *OK*, and wait to see whether your guess was good. If not, it's back to square one.

Assuming you manage to achieve satisfactory results with your final *OK*, SIOX will now flag all the background components of the image as transparent, letting you edit the remaining foreground components.

SIOX in GIMP 2.4

The latest version of GIMP improves usability by integrating SIOX as part of the *Foreground Extraction* function.

To install GIMP 2.4 on Ubuntu and Debian, type `sudo apt-get install gimp`

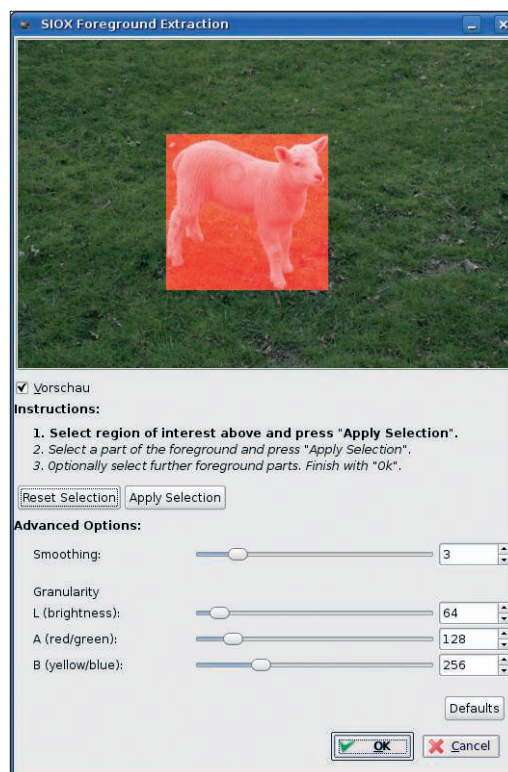


Figure 2: Step one of the extraction process is to roughly select the foreground of the image with a rectangle.



Figure 3: Select the image component you want to extract by holding down the left mouse button and dragging to draw a rectangle.

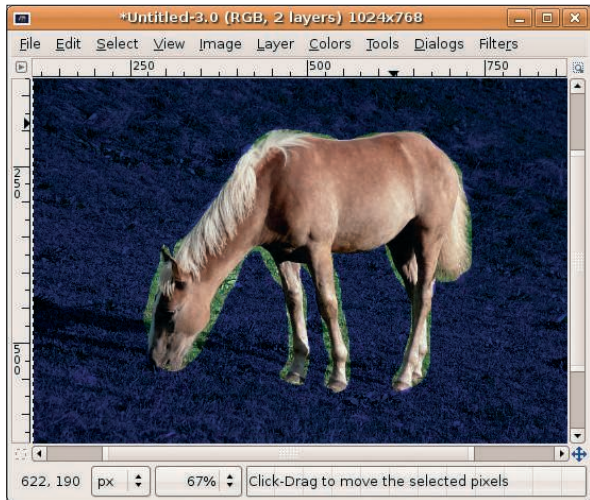


Figure 4: In GIMP 2.4, the background changes to blue after you trace the contours of the foreground object with the lasso tool.

at the console. Users with openSUSE can type `yast -i gimp`; if you have Fedora, the command is `yum install gimp`.

The principle for using SIOX in GIMP is basically the same: Start by roughly selecting the foreground, then refine your selection. When you select the foreground extraction tool, the mouse pointer also shows a lasso. Selecting all of the foreground by holding down the left mouse button and dragging the mouse is important; do not worry about the background at this stage.

When you release the mouse button, the background of the image will change to blue (Figure 4), and instead of the lasso, the mouse pointer now shows a

brush.

To set the brush size for refining the foreground selection, you can use the slider tool, and use the brush tool to drag a line into the foreground object. The line should contain all the different color and brightness areas in the object (see Figure 5). The more aspects you cover, the better the results will be; when you release the mouse button, you will see what I mean.

Avoid dragging the line into the background; inadvertently selecting the

background will prevent you from extracting the foreground element from it. When you let go of the mouse button, GIMP will paint the non-selected elements dark.

Pressing Enter keeps the foreground object selection. Pressing Ctrl + C copies the selection to the clipboard, Ctrl + X cuts the selection, and Ctrl + V inserts the selection into another image.

If you are not happy with your selection, you can select any other tool – before pressing Enter – to discard the selection; the Ctrl + Z keyboard shortcut is disabled here.

Extraction works well with just a couple of easy steps; however, if the results

are not what you expected, a variety of refinement options are available.

Fine-Tuning

With the *Contiguous* option enabled, the brush stroke will only be applied to areas that directly touch the selection. If you remove the check mark, GIMP will select areas with the same or similar colors, even if the areas do not directly touch the selection.

The *Smoothing* option might make it easier to select critical areas. If you set the slider to 0, the tool will not select inclusions of above one pixel. If you choose a higher value, the foreground extraction tool will cover larger areas.

Conclusions

Simple masking via rectangles works quite well with simple objects, but to see SIOX’s true capabilities, you need the lasso and brush tools in the GIMP 2.4 *Foreground Extraction* function. In both cases, the results are impressive, although you may need to fine-tune the tool settings.

If you use SIOX as a plugin, you will need to live with its failings – there is no preview function, and SIOX does not store your settings.

For the most part, these weaknesses have been removed following integration of SIOX into GIMP 2.4. GIMP 2.4 keeps the settings and it also offers a preview; however, you cannot easily undo individual steps.

If anything goes wrong, you will need to repeat the process. ■

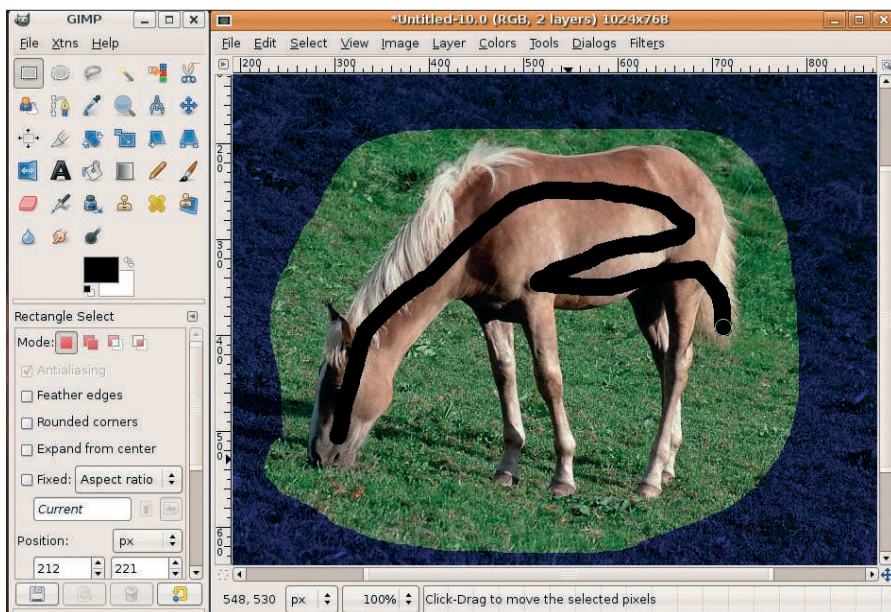


Figure 5: Draw a continuous line to cover as many different color and brightness areas as possible.

INFO

- [1] SIOX homepage: <http://www.siox.org/>
- [2] Wikipedia on pixel and raster graphics: http://en.wikipedia.org/wiki/Pixel_graphics
- [3] Wikipedia on vector graphics: http://en.wikipedia.org/wiki/Vector_graphics

THE AUTHOR

Thomas Pelkmann has worked for more than 20 years as an author and editor for radio, newspapers, and business and computer magazines.



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