GIMP WORKSHOP: Image processing with Gimp: part 8
COLOUR RUNS

It's best to quit while you're ahead, so they say, which is why this is the last part of our Gimp Workshop by Simon Budig

Paths enable users to define the outlines of objects or simple figures. Gimp's path tool is based on so-called Bezier curves, which may also be familiar from other graphics programs. A Bezier curve is defined by means of two support points and two control points. In Figure 1 you can see roughly how the various points affect the curve. By placing several of these segments behind one another you can draw more complex figures. Incidentally, if the end point of such a path coincides with its starting point this is known as a closed path.
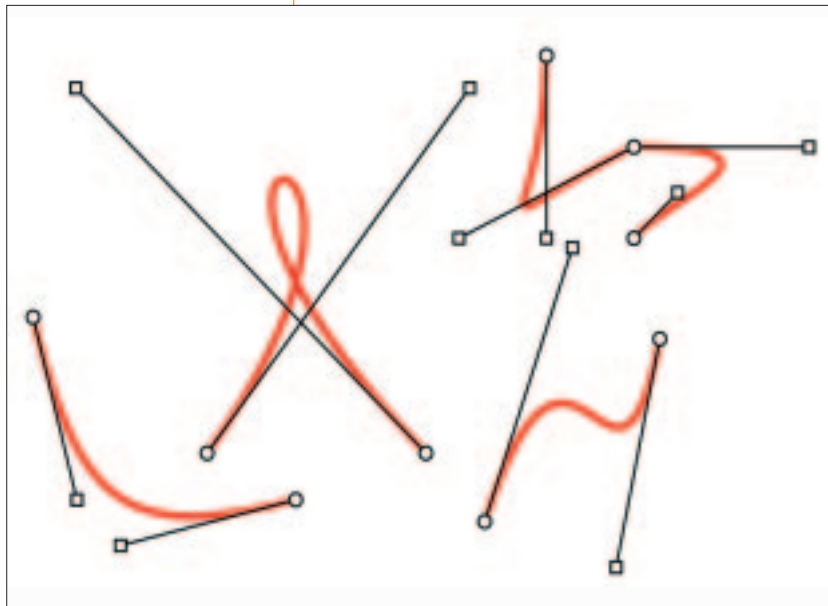

Figure 1: Various types of Bezier curve

Figure 2: The various path tool buttons

Let's get one thing out of the way before I start: I don't like Gimp's path tool. I find it counter-intuitive in comparison with other programs and sometimes limiting, but since it offers an important functionality I will describe it here in detail.

Start Gimp and open a new image. Open the Layers, Channels & Paths dialog and select the Paths tab. Now activate the Bezier tool (the pen nib with a curve, on which a point sits) and click in the image. In the dialog there will now appear a new entry for the current path. The first support point has also appeared in the image window. If you hold down the mouse button you can drag the control point out from the support point.

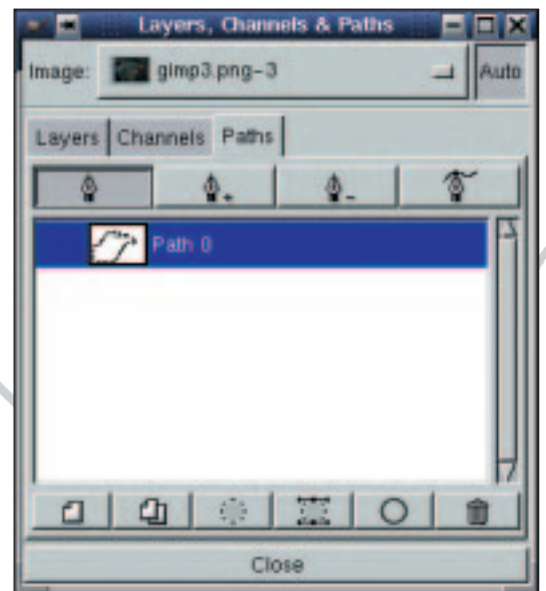If you click once more in the image area the second support point appears and the Bezier curve between them will become visible. You can now drag out the second control point. In this way you can very quickly copy the rough outlines of an image element. With another click on the start point, the path is closed.

Depending on where we click in the image different things will happen. If the path is closed and we click inside it, the path is converted into a selection. We can now handle this as a normal selection. If we instead click outside, a new component of the path starts. In this way we can define a path covering several areas. Due to the crude data structure inside Gimp it is unfortunately not possible to have several open components, which would be useful for arrows and suchlike.

Be careful when you try to correct an existing path. You can in fact, as is the custom in other programs, drag the control points through the locality with the mouse. (Normally Gimp will move two opposing control points symmetrically, but if you hold down the Shift key they can be moved independently). However, in the case of support points this doesn't work: instead of moving the point, the support points are dragged out again – I have ruined many paths myself in this way. To move a support point, you have to press the Ctrl key at the same time.

With the four buttons in the upper part of the path dialog (Figure 2), it is possible to toggle the Tool
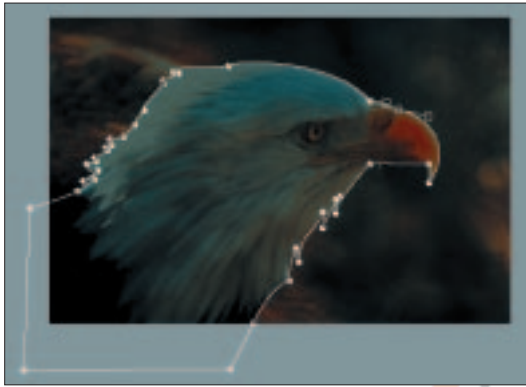
Figure 3: Frame the eagle with the path

between four operating modes. From left to right, these are the tools to:

- Create or continue a new path
- Add nodes to a path
- Delete nodes from a path
- Modify the nodes of a path

If we click outside the nodes with the last three tools, Gimp automatically switches to the first tool. It is possible to tell from the shape of the mouse pointer what will happen with a mouse click.

With a bit of practice, it is possible to adapt the paths to a specified form. Click on the start point, drag the control point as appropriate, release the mouse button and click on the next support point. Using different combinations of the Shift and Ctrl keys, the position can now be adjusted and both control points can be placed independently of each other. You'll simply have to forget about trying to correct the third to last nodes again – or else you will have to manually switch to the modify path tool (the fourth button).

What are paths for? I would like to give two small examples. For the first we will use an example image of a bald eagle, the heraldic animal of the USA. After loading the image into Gimp we zoom into the image a little, so we can place the points more precisely. Select the path tool and click on the upper edge of the neck, on the left edge of the image. We have to do a bit of guesswork here, as the image is
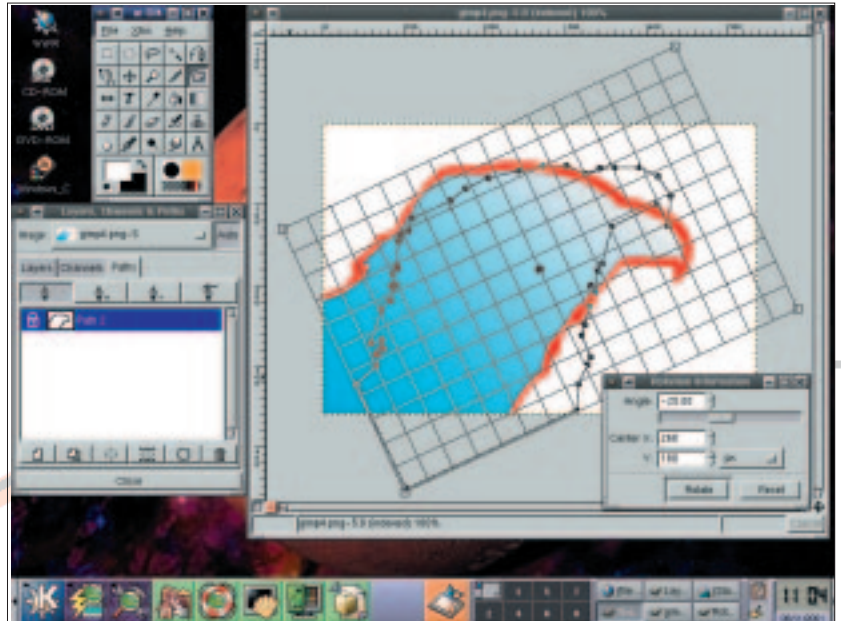

Figure 4: The eagle turns into a logo

very dark. Now we create the path along the head. At the beginning we will have to place support points on the tips of the feathers. At the places where the plumage is more close-fitting, fewer support points are needed since gentle curves can usually be approximated nicely using the control points. In Figure 3 you can see the finished path.

As you can see, we have closed the path outside around the image. If the path is converted into a selection this guarantees that the selection also includes the left lower corner. Otherwise the start and end point would be directly linked to each other, which would mean leaving out a triangular area.

Now we have the outline of the eagle in a geometric form, we can use it to draw fairly graphics-orientated logos. Create a new layer with a white background and click on the third button under the path list. The path is now converted into a selection. Using the colour fill tool, which I will describe in detail below, we can now fill the form of the eagle with a colour fill. Deactivate the selection, select the paintbrush tool with any paintbrush from the paintbrush dialog and set red as foreground colour. We have used the calligraphy brush. Using the fifth button under the path list, the path will now be followed by the current tool (Figure 4).

In this way, you can make fairly graphic elements out of photos. You can also export a particularly successful path into a file, and later insert it into another image, via the pop-up menu in the path dialog.

A few more comments on paths: Unfortunately paths are not scaled when you scale an image as a whole, but there is the option to change paths using the transformation tool. Click in the space to the left of the path preview image and an image of a lock appears. If you now rotate or blur the perspective of the image using the transformation tool (rotation, scaling, shearing, perspection) the preview grid also

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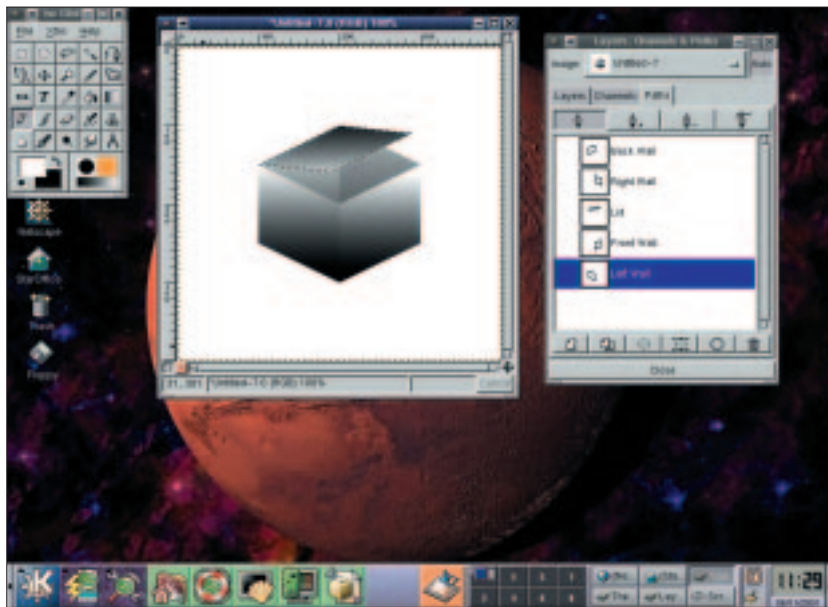
Figure 6: A box made from paths and fills.

Figure 7: The tool settings for the blend tool

shows a preview of the path (Figure 5). If the transformation is then applied, the paths marked with a lock will then also be adapted (Figure 5).

If you need to move a path as a whole, click any support point on the path with the Alt key held and drag it into position. Like layers, you can also rename and duplicate your paths.

It can sometimes be very useful to convert a selection (to be more precise: its edge, as displayed by the marching ants) into a path. Simply click on the fourth button under the path list and wait a moment. The result is not always ideal but it's acceptable.

By the way, you can also set the parameters for optimisation: if you hold down the Shift key and press the button, a large dialog appears with lots of parameters. I don't know exactly all the things you can set with them but there are probably some image editing experts out there delighting in this option.

Paths can also be used to construct geometric objects, in particular polygons. The normal selection tools are restricted to ellipses and orthogonal rectangles. With paths you can create any polygon you like with a couple of clicks and convert it into a selection at the touch of a button. In Figure 6 you will see a box, whose walls have been constructed using paths then converted into a selection and filled with a gradient colour fill.

Gradient blends

Until now I've shamefully neglected the gradient tool, as I assume you've already tried it out a bit. However, since there are also a few nice touches hidden here I'd like to cast a bit more light on the subject. If you click in the image with the activated blend tool, drag the mouse a little way and release the mouse button again, a gradient fill will be painted from the foreground to the background colour. The artificial line indicates how "soft" the colour fill runs and in

which direction it is oriented. It's not wildly exciting but it's certainly useful.

Now open the tool settings by double-clicking on the tool icon (see Figure 7). From here you can now set a multitude of options. Uppermost are the options which are present in all painting tools: the opacity and the paint mode. You may want to try out the Mode settings with another tool, in order to understand the various options, but Normal really is normal; it's only very rarely that you'll need other modes.

Under this it then gets a bit more specific. With Offset you can set the percentage at which the fill really begins. For normal fills this scarcely matters but have patience...

With Blend you can define which colours the colour fill should use. The top two entries overlap between the foreground and the background colour, once in RGB mode and once in HSV colour mode. The HSV changes are usually more colourful, as they run along the colour wheel (see also Part 1) and so cover a broad colour spectrum. You can usually do more with the RGB colour mode. The entry FG to Transparent blends from the foreground colour towards transparency, for example the colour slowly fades towards the outside. With the last entry you can use the user-defined colour fill, which can be seen in the main toolbox at the bottom right. With a click on this preview (Active Gradient) you can access a selection dialog. Don't worry, I'll explain how you can define your own gradients.

The gradient entry defines the form of the colour fill:

● Linear we have already met
● Bi-Linear reflects the colour fill again on the opposite side
● Radial paints the fill in a circle with the length of the artificial line as the radius about the start point (the direction of the artificial line does not matter)
● Square is just a square where the end point of the artificial line lies on the outer edge of the square
● Conical arranges the colours of the fill like rays about the start point, the direction of the artificial line specifying the orientation. In the case of symmetrical, the fill only paints over half the angle and is reflected on the artificial line, while with asymmetrical it paints over the whole angle
● The Shapeburst fills adjust their shape to the current selection. While angled treats all colours equally, spherical favours the first and dimpled favours the last part of the colour fill.
● The Spiral fills are very useful for hypnotic eyes. These come in clockwise and anticlockwise forms. The artificial line is used to define the width of the spirals and the direction of the 'nose' in the midpoint.
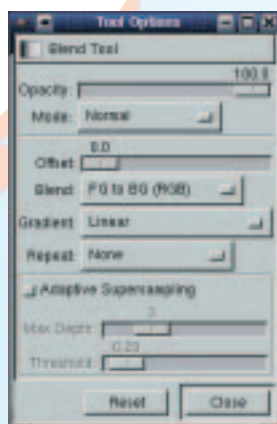
In Figure 8 you can see a brief overview of the various forms of fills.

**Figure 8: Various forms of gradients:
top: Linear, Bi-Linear, Radial, Square, Conical (symmetrical),
bottom: Conical (asymmetric), Shapeburst (angular),
Shapeburst (spherical), Spiral (clockwise), Spiral
(anticlockwise)**

The offset parameter means the colour fill does not begin immediately at the starting point of the artificial line. The best way to explain this is using a radial fill. If you use the artificial line to define a radius of 100 pixels (this will then reach the outermost colour of the fill), the change parameter will define the radius of the innermost colour of the fill. With an offset of 30 per cent the fill would only start to run at a distance of 30 pixels from the midpoint. The inner area will be filled with the starting colour.

In the lower area of the dialog, you can activate Adaptive Supersampling, which essentially boils down to antialiasing at sharp colour transitions. This does, however, increase computing time.

Gimp comes with a whole heap of useful gradients but the chances are when it comes down to that crucial moment, the right colour won't be there. To remedy this, pull up the gradient blend selection dialog and click on the edit button. In Figure 9 you can see the dialog which appears, which is divided into three areas. At the top left you can see the list of available fills, on the top right are a few basic operations and at the bottom is the editing window. Under the gradient you will see a bar with black and white triangles. A gradient is composed of several segments, at whose end points you can define a colour in each case. The black triangles separate these segments. If you drag the triangles back and forth you will see how the fill changes accordingly. The white triangles can move the focal point of the colour within a segment. Normally they stand in the centre between two segment end points.

Segments can be selected by clicking in the area

Figure 9: The dialog for definition of gradient levels

between two black triangles. The pop-up menu which appears on a right-click always relates to the segment marked dark grey. You can extend the selection by clicking with the Shift key pressed. If you click on a triangle you can move it and adapt the gradient accordingly. By clicking in the dark grey region you can move the whole area; if you had pressed the Shift key at the start of the click, the white triangles to the left and right of the selected area would also have been altered.

You can access the pop-up menu via the right mouse button. As already mentioned, this relates to the area currently selected. You can now define the
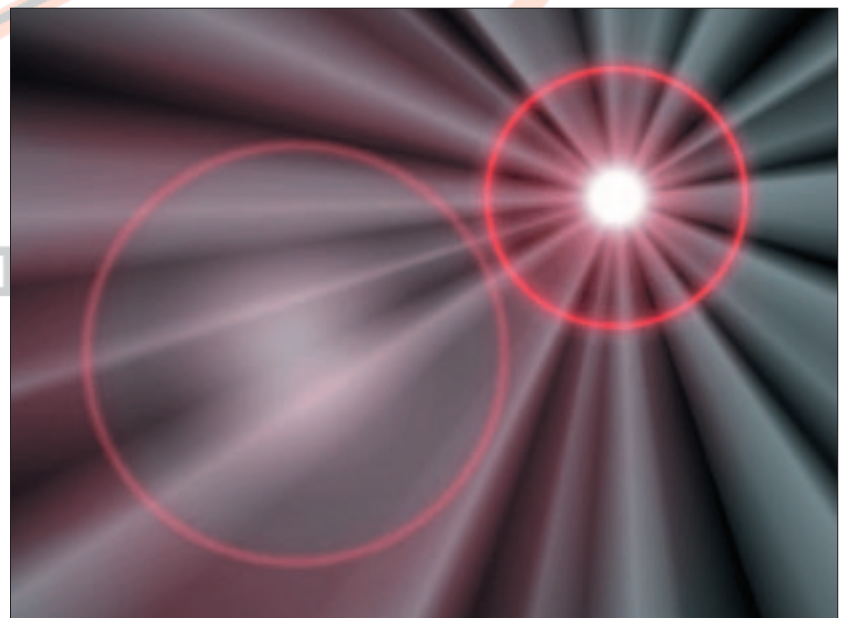
Figure 10: Light effects with the Flare Glow fills

colour (and transparency) of the left and right corners. Frequently-used colours (the adjacent colour of the next segment, foreground colour and the colour of the other end) are then immediately available; you can also save up to ten colours for rapid access in the menu.

From this menu you can also access other functions which influence the details of your fill. You can define how the transition between the end point colours will occur, re-arrange the triangles, split up and delete segments and so on. Every colour can also be assigned a transparency. With Gimp there are some colour fills which come as standard, in the Flare Glow fills you can see how these can be used to best effect (Figure 10).

That's it. I hope I have been able to help you understand the basics of Gimp. Of course, this Workshop could never cover all the functions in Gimp – it's not without good reason that you'll find inch thick books dedicated to the program. Have a go and see what else you can get out of Gimp. I'm inviting you to send me your tips and tricks (sbudig@linux-user.de) and if a suitable number can be collected, we'll publish them here in this column.

Happy Gimping! ■

The author

Simon Budig is a maths student at the Uni-GH Siegen. He now uses nothing but Linux, to pound Gimp into the subconscious of innocent victims. He was incited to do so within Unix-AG, which carelessly allowed him to make contact with the developers of Gimp.