

IMAGE EDITING

GIMP photo restoration



Digital image manipulation is a subject area that reaches far beyond web banners and movie magic. *The GIMP* provides the tools necessary for quality photo restoration, as **Michael J Hammel** demonstrates.

An often overlooked corner of the digital image editing realm is photo restoration and retouching – the art of preserving and enhancing old photographs that have been folded, misused or cracked and faded with age.

While the face value of most 100-year-old photographs is little more than their original worth, the personal value can seldom be measured. Restoring worn and faded photos to their original or near original look can be of high value to families and even corporations looking to track their lineage. In some cases, restoring photographs is the only way to verify facts. A damaged photo might show if an individual was present at the time the picture was taken. It could also show the time of day from the clock on a wall at an important event, or by orienting the shadows cast on the ground at the same location years later.

There are a number of complex tricks that can be used to rebuild damaged images, but the most common trick is to simply clone similar areas as replacements for the damaged areas. The GIMP provides a Clone tool that allows using brush strokes (and,

thus, any brush shape) to copy one area to another. However this method is only appropriate for small cleanup work such as removing a dust speck or hiding a thin, short scratch. Additionally, this method is destructive – the cloning occurs on the layer where the damage exists so if your patches are not to your liking you may not be able to undo them easily.

A better approach for larger blemishes is to make a selection, copy and paste it as a patch layer and blend this patch layer into the original using the airbrush tool in a layer mask. This allows changes to be made later either by modifying the layer mask or completely replacing the patch layer.

In this tutorial, we'll look in depth at the copy/paste method of fixing heavily damaged images. We'll include discussion on when to use large selections to patch large areas and when to break a blemish into pieces to fix independently. If you're feeling the need to practice the photo restoring techniques you learn here, check out the RetouchPro website (www.retouchpro.com/) and try some of their Challenges that are open to all visitors.

Folds, bends and tears

As you can see, this image has numerous large blemishes. Working on too large an area can cause colour and contrast problems. So we'll break some of these into smaller sections and address them a piece at a time. Use obvious delimiters in the image to choose sections to work on. In this image the area between the arms and midsection offer natural boundaries, as do the hair and bridge of the nose.

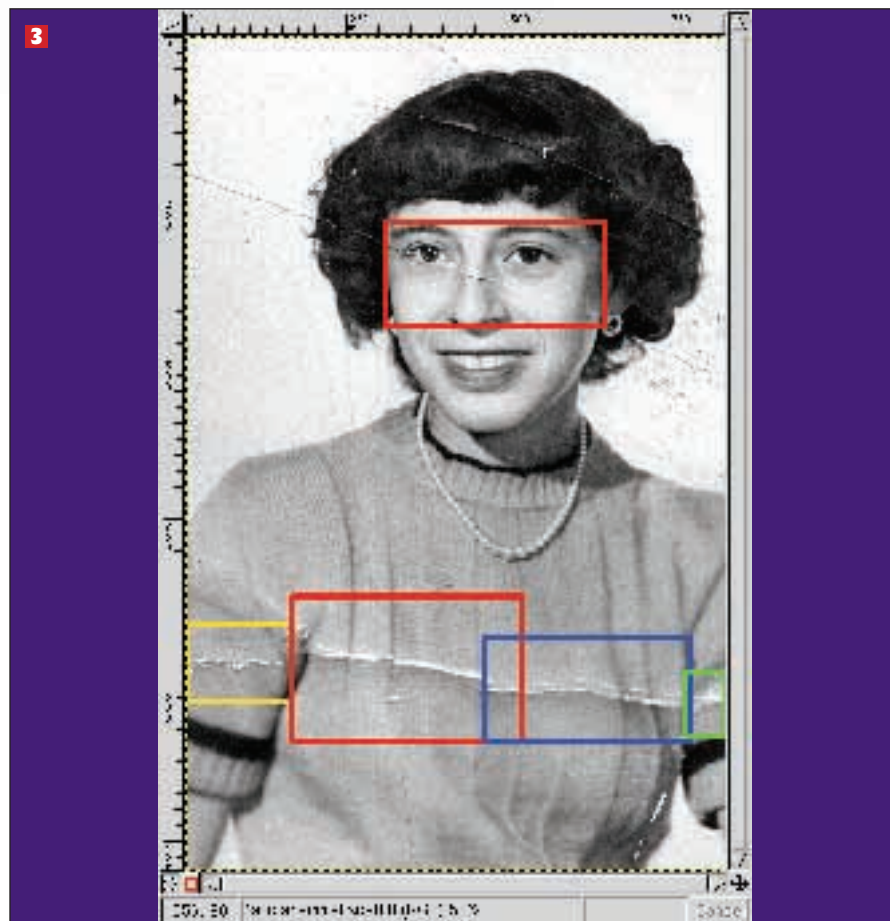
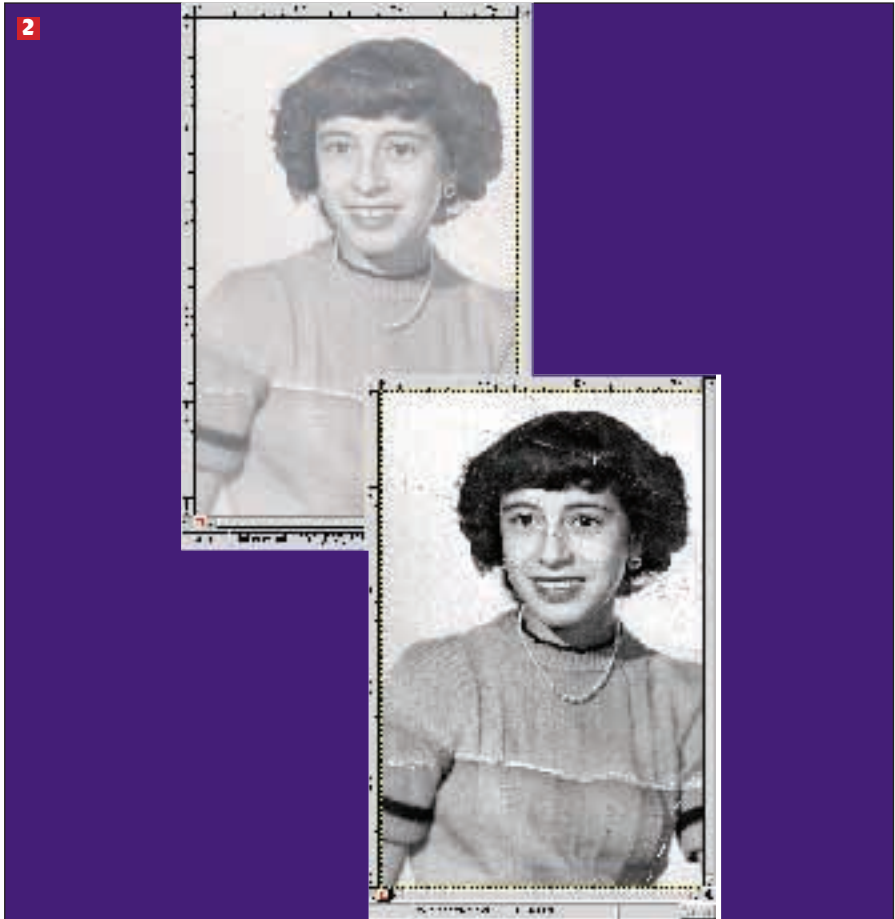
Original scanned image

1 This image was scanned from a 60-year-old photo that had been creased several times, one of which caused the photo to actually tear slightly across the subject's midsection. There are multiple problems to fix here: the faded image needs to have its white and black points corrected, the multiple creases have to be removed where they cross the woman, and the background needs to be cleaned up. There are also barely visible vertical scratches through the midsection, but these can be handled much the same way as the much more visible horizontal scratches and won't be addressed here.



Original/updated comparison

2 We start with some basic image enhancement. We need to fix the white and black points for the scan. We use the Auto-Levels option in the Levels dialog to produce a higher quality image – the contrast is better and the image is clearer. Next we note that the image has taken on some brown tint as it has aged. We clear this by desaturating the image. Finally, as with most scanned images, a little image sharpening is required. We use the Filters>Enhance>Sharpen filter for this process. The UnSharp Mask could also be used although for this image the result would not be significantly better.



Scanner support

Where to get your drivers

SANE
www.mostang.com/sane/
 XSANE
www.xsane.org/
 Vuescan
www.hamrick.com
 Image Scan!
www.epkowa.co.jp/english/index_e.html
 QuiteInsane
<http://quiteinsane.sourceforge.net/index.shtml>
 Epson KOWA
www.epkowa.co.jp/english/linux_e/lsd_e.html
 Linux USB Project
www.linux-usb.org/

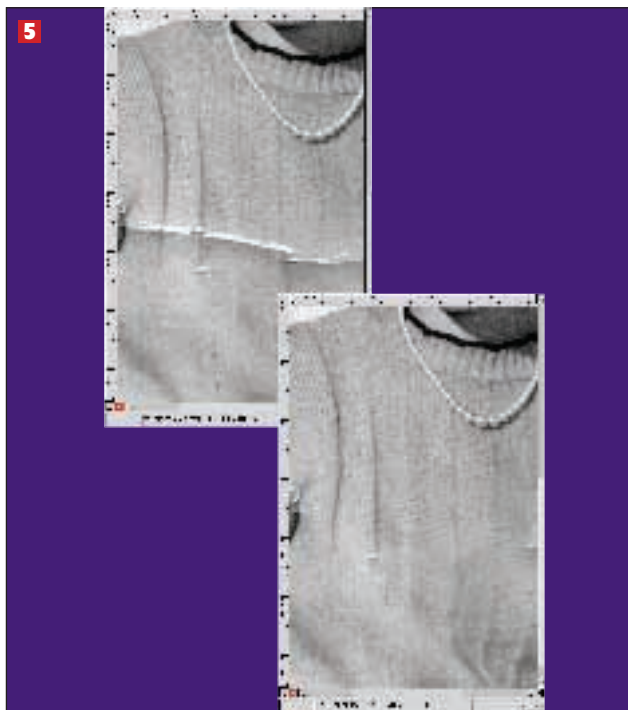
Sections to be worked on

3 There are two main blemishes that fall across the subject: the diagonal fold across face and the horizontal scratch across the midsection. Both will have to be handled by breaking them into multiple and distinct sections and using the same patch layer technique on each. The problem with the midsection scratch is the shadow caused by the scratch itself. If there were no shadow, we could make multiple Fuzzy selects on sections of the scratch, grow them a bit and use this selection to grab a nearby section of the sweater as a patch. But the shadow means we need even a larger selection as a patch so we're better off just using a lasso selection right from the start. >>

TUTORIAL GIMP

◀ Patch positioned over scratch

4 Choose the lasso tool from *The GIMP* Toolbox. Draw a selection around part of the scratch making sure to include the scratch shadow as well. Hold down the **Alt** key (the **Shift** key may also be necessary depending on your Linux desktop configuration) and drag the mouse to move the selection just above the scratch. Use **Ctrl-C** to make a copy of the selection (this will be our patch) and then **Ctrl-V** to paste the selection as a new layer. Position the layer over the scratch. You should be able to line up the pleats in the sweater fairly closely, but perhaps not exactly. We'll fix that in a moment. The original image is tinted red here to show the outline of the patch being applied. Notice that some of the scratch exists in the patch as well. This goes away with the next step – applying a layer mask.

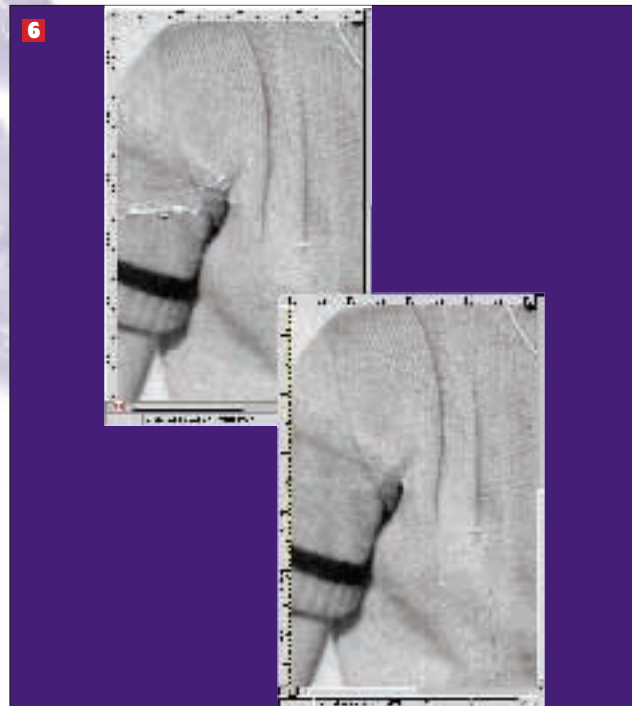


Rip before/after comparison

5 Add a white layer mask to the patch layer. Use the Airbrush to paint black along the edges of the layer inside the mask. This will have the effect of melding the patch into the original image. As long as your selection was large enough you should have a bit of working space in the patch in which to do this melding. If the patch doesn't match the tonal qualities of the scratch area you can adjust its *Curves* a bit. Only slight modifications to the Curve should be necessary for this image. To line up the pleats more precisely, make sure the layer content is active (not the layer mask) and use the *Warp* plug-in to move the pleats just a bit. Turn the layer visibility for the patch on and off quickly to see if the patch lines up well with the original image. As you do this it should appear like the pleats are in place and only the scratch is removed.

Sleeves before/after comparison

6 The scratch across both sleeves poses a more difficult problem. There is no unblemished area large enough to cover these scratches so they require multiple smaller patches. In this example we've used six smaller patches to fix the scratch on the left-hand side sleeve. Additionally, the dark area between the sleeve and midsection has a very complex pattern. The patch here will more than likely require *Curves* adjustment.





Face before/after comparison

7 The face is more difficult than the midsection because of the smooth facial features. Differences between the patch and the face are much easier to notice than between the midsection and its patch. Even so, the facial scratches are best handled by making freehand selections just like the midsection patches. The main difference is that you make much smaller selections, bounded by high contrast lines such as between the face and hair or the bridge of the nose and the shadowed sides of the nose. The eye poses a particularly hard problem because of the complex detail of the image there. In this case, make a selection of the eye, copy and paste it as a patch and then use the Clone tool from the Toolbox to paint out the scratch manually.

Background selection painted with Quick Mask

8 Cleaning up the background is a no-brainer. Make a selection using the Quick Mask and an appropriately sized brush. Note that painting with white will remove the reddish tint of the Quick Mask – that's what you want to happen. You can paint inside curls of hair where the background shows through as well. The painted areas (which are no longer tinted red) will become the selected area when you click on the Quick Mask to Selection button on the bottom left of the Canvas window. Now use the Color Picker tool (the eyedropper icon in the Toolbox) to select a colour from the existing background. Use the Bucket Tool to fill the selection with this colour. Voila! Instant updated background.



Final before/after comparison

9 The results for this image are dramatic. The only visible remnant is a horizontal scratch on the lower right. A closer inspection (not visible in a screen shot) shows a thinner and much longer scratch starting at the left shoulder and running to the bottom of the image. Both of these can be handled with techniques already described.

NEXT MONTH

To create a bit of suspense, we're not telling you what we're covering next month! Get your suggestions for future GIMP tutorials in to us at linuxformat@futurenet.co.uk