

Upscaling digital camera images

You can not get detailed information out of a picture if it's not there to start with. Or can you? Work on CCTV video frames, shots from space probes and all kinds of degraded or very low resolution sources has proved that you can in fact recover more detail than the eye can see.

For several years now software developers have been devising ways to interpolate, sharpen and enhance digital camera images in such a way that they can be printed larger without pixellation (jagged edges or a mosaic effect). Some programs such as Extensis *pxlSmartScale* appear to use a vector-based interpretation, taking areas of tone and mapping them in scaleable form, with adjustable sharpening of edges details. The best-known utility, *Genuine Fractals*, uses a method which 'grows' larger images based on the patterns and textures of the original, but leaves it to the user to do any subsequent sharpening.

Digital camera users can work with Adobe *Photoshop CS* or *Elements 3 Camera Raw 2.4* file import, which allows a set number of fixed larger sizes from each camera type, created directly from the raw file (such as .CR2, .ORF, .NRF, .DCR or .MRW).

Any *Photoshop* user can use Bicubic Interpolation to up-size an image, and there is now a choice of Smoother or Sharper; the advice given is to increase image size using Smoother, but reduce images using Sharper – or just keep with standard Bicubic for everything.

We tested two new programs which do not use vector or fractal methods, *PhotoZoom Pro* (formerly S-Spline) and *SizeFixer SLR*, both now available in either Mac or PC versions, and compared them with all the methods above.

Speed and quality

The fastest to use directly within *Photoshop* is *pxlSmartScale*. The results are better than the preview indicates, but there is a hint of artificial sharpness present which is easily over emphasised if you use the edge enhancement controls.

Picture libraries are asking for images sizes larger than digital SLRs will produce directly. Is Photoshop resizing good enough – and do special programs do it better?



SizeFixer SLR builds preview images block by block, slowly. The original 8 megapixel image is shown left.

Genuine Fractals is the most complex in workflow and simplest in controls. You must export a GF master file from *Photoshop*, then re-open this saved file. The opening dialogue gives you the scaling options. It is very hard to fault the final image produced by GF, but it is only marginally better than Bicubic resizing. It is fairly fast.

Adobe *Camera Raw* scaled-up file opening is very fast indeed, and offers fair competition to GF – a little better than Bicubic, again. However it is limited to some odd pixel dimensions which seem to be calculated on the basis of the CCD used. If you want a size other than these choices, you can not change the settings.

PhotoZoom Pro works by exporting a file (bitmap, TIFF or JPEG etc) from *Photoshop*. You get many choices of interpolation and sharpening, but the default S-Spline method is best. It's sharper than Bicubic or GF, but may emphasise noise and aliasing along with fine detail. It also strips out all EXIF data, colour profile and IPTC metadata fields which will be a no-go situation for many users.

SizeFixer SLR is by far the most versatile offering, but incredibly slow. We tested both PC and Mac versions and even the preview building cleared blocks of image one by one was tedious. Real image processing can take from minutes to hours.

The *SizeFixer* controls are awesome and it includes a database of digital cameras, used in its extra high quality finely detailed mode. As long as you are working from a TIFF or first quality JPEG, *SizeFixer* can recover fine texture and detail which is not visible in the original, and makes 50-100 per cent enlarged versions of the highest quality. It's the best to date for DSLR images... but too slow for any kind of professional workflow. It also created 'stripped TIFFs' which could not even be placed on DTP pages directly and had to be opened and resaved in *Photoshop*.

If *SizeFixer* was six to ten times faster, it could be recommended without hesitation. It is still being refined by its authors and upgrades should be free.



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Here, all are reproduced at 300dpi, as for normal magazine or top quality photo print use. No sharpening has been applied, so all the reproductions will look slightly soft to the eye, but this enables the maximum amount of fine detail to be held. The camera was a Konica Minolta Dimage A2 8 megapixel 2/3rds sensor model and the sample file was exported with no sharpening to TIFF from RAW.