

Princes Risborough U3A Photography Group - Software for processing photographs

Introduction

These notes reflect my experience with various software products designed to process photographs taken with digital cameras.

The best known software products are Photoshop and Lightroom from Adobe, but these are not discussed here as I have not used those products.

Microsoft Photos

This is the free software that comes with Windows 10 – I don't know about earlier versions of Windows. It is probably the default software that runs when you double-click on a photo file. It is good for viewing photos, and can be used for simple photo processing. It's difficult to be precise about its capabilities because it keeps getting updated – I have had four versions over the past year – and features come and go. But as a general statement, the features are very limited.

However, I quite like it as it is quick and easy to use within its limited capabilities. Today's version includes the following capabilities:

- Crop
- Rotate
- Change brightness and contrast. I particularly like the option to lighten/darken just the highlights or shadows.
- Change the colour saturation and hue
- Change the clarity
- Apply or remove vignetting
- Removing Red-eye or spots
- View the EXIF data
- Print
- Run a set of slides as a simple slide show
- Draw freehand lines over the image

Microsoft Photos can be used to view and process RAW files as well as JPEGs: like other software it can save only as JPEG, not as RAW.

Adobe Photoshop Elements

Photoshop Elements is a cut-down version of Photoshop. It cannot be used to process RAW files.

Photoshop Elements offers tools to organise your photographs (which I have not used) and to edit them.

There are many editing capabilities, including:

- Crop
- Rotate
- Skew/distort/change perspective
- Adjust brightness, contrast, colour, and convert to black and white
- Remove red-eye
- Correct lens distortion by manually entering various settings
- It supports Layers, allowing multiple photos to be overlaid, processed separately, and merged (i.e. stacked).
- It offers many options for applying artistic effects to the whole image, such as applying brushstrokes, distorting the image, adding noise, pixellating.
- Creating calendars, slide shows, CD jackets, greeting cards, albums, etc.
- Printing. (I like using the printing capability because it gives you a preview of what the print will look like.)
- Save JPEG images at lower quality to reduce file size.

Google Nik Collection

This is free software (download from <https://www.google.com/nikcollection/>) which allows you to add effects to images. It is designed to be used as a Plug-in with Photoshop or Photoshop Elements. If you are PC-techy you can find instructions on the Internet on integrating it with some of the other products I mention below – GIMP and RawTherapee: I have not tried this.

The collection includes the following modules:

- Analog Efex Pro – to make your images look as though they were taken on vintage film cameras.
- Color Efex Pro – applies a wide range of colour effects to the whole image.
- Silver Efex Pro – applies a wide range of black & white effects to the whole image
- Dfine – for reducing noise
- Viveza – basic brightness/colour/saturation control, but it also allows basic colours to be processed separately. It also allows you to free-hand draw on the image.
- Sharpener Pro – lets you adjust the detail and sharpness of your image.

GIMP

This is free software, which can be downloaded from <https://www.gimp.org/downloads/> . I use this software more than any other. It includes all of the editing capabilities described above for Photoshop Elements plus some useful additions. Like Photoshop Elements, GIMP cannot process RAW files (at least, not on Windows PCs).

A couple of features that I use which I cannot find in Photoshop Elements are:

- the ability to process individual colours (e.g. amount of colour, saturation brightness).
- the ability to select an area of the image of any size and shape and to apply changes (such as contrast, brightness, hue, saturation, ...) just to that area. For example, in the image below the colour of the red bands on the post in the background was toned down to make the post less obtrusive.



I also find the handling of layers easier in GIMP than in Photoshop Elements or in paint.net.

RawTherapee

This is free software, available from <http://rawtherapee.com/downloads> . As its name implies, it is designed to process RAW files. But it can also process JPEG files, although more functions are available when processing RAW.

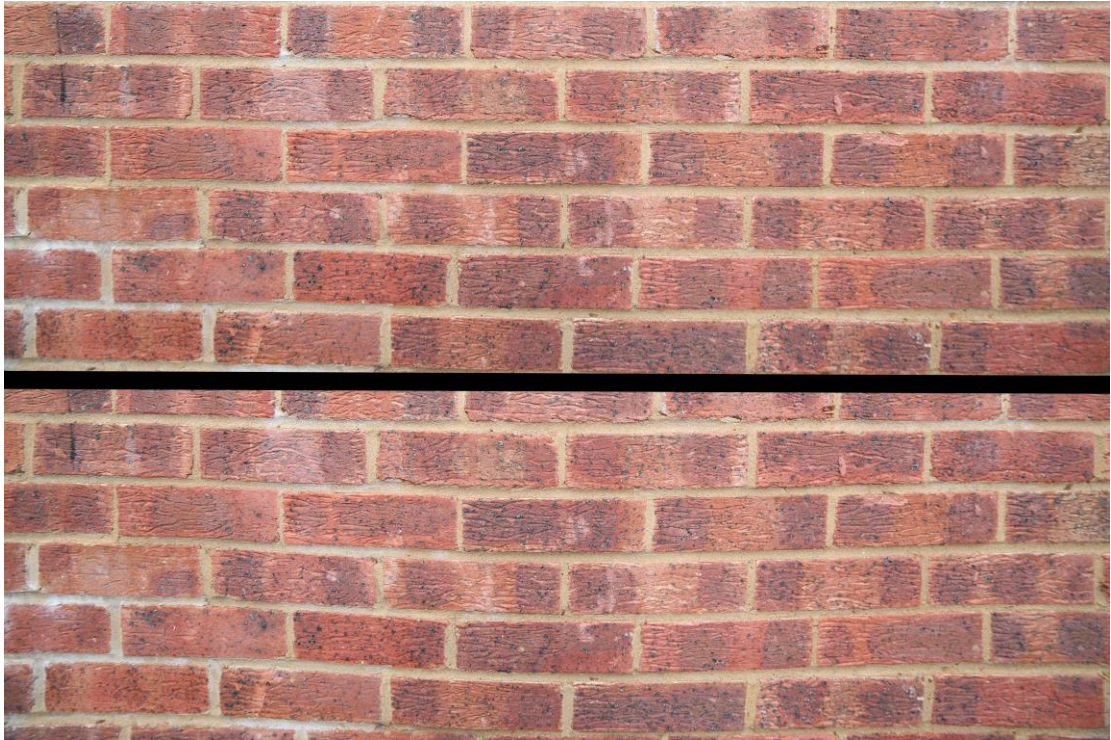
It has a huge set of features to process images in areas such as colours, contrast and brightness, sharpness and image quality – in fact there is so much there that it is quite daunting for the average amateur to use.

I prefer to use some of the other software tools. However, there are two areas that the product is superb at, and I regularly use it for these purposes:

- White balancing – i.e. getting the correct colour balance, even if you had the incorrect white balance setting when taking the picture. RawTherapee has a spot white balance option with which you can click on even a very small area of the image which is supposed to be neutral white or grey, and the colour balance is adjusted to this. For example, in the image below the left side of the image shows the effect of white balancing, choosing a sheet of paper on the sofa as a reference point.



- Lens distortion (or aberration) correction. This may not be important to you if you are using, say, a Canon camera with a Canon lens, because the camera may well have a function to correct lens aberrations for lenses that it recognises. However, this in-built function does not work if you are using third-party lenses (e.g. from Sigma or Samyang). But RawTherapee has a "Profiled Lens Correction" function which allows you to select your camera and lens from pull-down lists. RawTherapee can also use Adobe .lcp files to get distortion correction data: you will have these files on your computer if you have installed Adobe products like Lightroom – even on a trial basis. Lens distortion correction is especially important when using wide-angle lenses (including the wide-angle end of zoom lenses) because these lenses tend to suffer most from distortion, vignetting (dark corners), and chromatic aberration (colour fringing). For example, in the image below the lower half illustrates the characteristic distortion of the Samyang 14mm f/2.8 ultra wide-angle lens, and the upper half is the image after the distortion has been corrected using RawTherapee.



paint.net

This is free software, downloadable from <https://www.getpaint.net/download.html> . It can process RAW and JPEG files, but provides a limited set of editing features compared with Photoshop Elements, GIMP, and RawTherapee. On the other hand, this makes it easier to use.

Its functions include:

- Change brightness and contrast
- Modify colours
- Modify individual colours
- Limited selection of artistic effects.
- Ability to select a randomly shaped section of the image and apply changes to just that section.
- Support for Layers – i.e. load a stack of several images, process them individually, and then merge them.
- Save JPEG images at lower quality to reduce file size.
- Print

I don't see much point in using this software – except that I find it really easy to make prints from this. I have a lot of problems getting GIMP to print what I want, and Photoshop Elements sometimes just refuses to print.

StarStax

StarStax is free software available from <http://www.markus-enzweiler.de/StarStaX/StarStaX.html> .

It does only one thing – and it does it very well. It is used to stack images to let you get an image with circular star tracks, as in the image below.



To photograph star tracks well, you need to make a number of exposures and then combine (or "stack") them. If you try to make just one long exposure of the sky at night, the image will get washed out by light pollution – especially near built up areas. Around High Wycombe, exposures need to be kept down to a minute or less. So if you want to photograph the star tracks over 4 hours, you will need to take 240 images!

How you would take those 240 images without working your camera manually through the night requires the use of a simple gadget, which we won't discuss here. But once you've got your images, you can just drop them into StarStax and it will then create a single combined image.

You could do this manually with GIMP or Photoshop Elements, but it would be a nightmare to manually add such a large number of photographs and combine them.

For more information about photographing star tracks, see the separate notes on this subject.

Focus Stacking Software

Focus stacking is a different kind of stacking to that which StarStax does.

Focus stacking is a technique to address the problem of photographing an object with depth (e.g. an insect eye under a microscope, a close up of a bowl of fruit, or a landscape ranging from flowers just in front of the camera to mountains in the background) and having everything in sharp focus.

The traditional way of trying to do this in the days of film was to use a small aperture on the lens (say f/22) and rely on the resultant large depth of field – i.e. the wide range over which the subject will be recorded relatively sharply. Although this helps, it is not a good solution: lenses do not give very good sharpness at small apertures like f/22, and the depth of field will probably still not be great enough.

The idea of focus stacking is that you use the lens at its best aperture in terms of image quality (which may be f/5.6 or f/8) and take multiple images from the same position – each image focussing on just one part of the subject. You might have just 2 or 3 images – or 100. The focus stacking software then combines all the images, selecting the sharpest parts from each image to build up a sharp image of the whole subject.

The results can be quite amazing, as in the image below showing the centre of an orchid.



I have tried out a number of focus stacking software products.

Free software

I have tried a number of free products. They work fine for many subjects, but all of them fell down in some cases – in particular with some close-up images of small subjects. But they are certainly worth trying out – they may be fine for your photographs. These are the free products I tried.

Picolay. Download from <http://www.picolay.de/> . This was the best of the free products that I tried.

ImageJ. This is aimed at the scientific community, and a bit harder to use. It is used for a variety of image processing tasks. You can download it from

<https://imagej.nih.gov/ij/download.html> and you will also need the extended Depth of Field plugin at <http://bigwww.epfl.ch/demo/edf/index.html> .

Combine ZP. This is an older product, and I found it kept crashing on my Windows 10 PC, so I didn't get very far with it.

Software to Purchase

I also tried two products that you need to pay for. Both of them offer 30 day free trials, and one-year or permanent licences. They both performed significantly better than the free software, and always provided a successful result.

Helicon Focus. (<http://www.heliconsoft.com/heliconsoft-products/helicon-focus/>)

This was the faster of the two products, but was marginally not quite as good in terms of image quality.

Zerene Stacker. (<https://zerenesystems.com/cms/stacker>) Although slower to run than Helicon, it gives slightly higher image quality. And so I bought this software – it's the only photo processing software that I have paid for – Photoshop Elements was bought for me as a present. (Zerene is also slightly cheaper than Helicon.) The image of the orchid provided above was created using Zerene.

For more information about focus stacking, see the separate notes on this topic.

Bernard Foot

Princes Risborough U3A

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