

Imaging Processing Software

Digital image processing is the general term used to describe a wide range of operations carried out to digital images. Strictly speaking, any digital image that is modified in any way by a computer has been processed, and the applications are widespread. Much of the technology has resulted from the space programme in the 1960s and 70s, when the first images beamed back from space required enhancement and analysis. Perhaps the most famous example is the Hubble space telescope, whose distorted images were partially corrected by digital image processing before it could be physically repaired in space. Other major applications include medical imaging, and machine vision, (where cameras monitor production lines, and can be programmed to automatically reject faulty components).

Image manipulation is a highly contentious area, and there have been several high profile examples of digitally manipulated or created images being used to illustrate news stories. A recent example is one of the wedding photographs of Prince Edward and Sophie Rhys-Jones. In the image of the main group, Prince William had a rather sullen expression. A picture of him smiling was pasted over the original image. The story made front page headlines in many UK national newspapers!

Digital image processing programs can perform a huge range of functions to images, including:

- enhancement of brightness, contrast and colour
- adding or removing of colour, or toning of images, such as sepia toning
- retouching of images
- sharpening of images
- manipulation of images
- distortion of the image, usually for creative effect

In addition to the above, a huge range of “special effects filters, generally for creative use, are available for image processing programs to add textures, simulate a lighting effect and even add the effect of lens flare to an image!

Many software programs also offer a range of other features such image data bases for the cataloguing and filing of digital images, “stitching software” for joining up a series of pictures to creating panoramas, and a huge range of templates for creating calendars and greetings cards.

There are very many different image processing programs available, varying both in their capabilities and price. Many of the less expensive programs (such as MGI PhotoSuite, and Adobe Photosho Elements) will still carry out a wide range of image enhancement and retouching procedures, and it is worth examining these carefully to see if they are adequate for the purpose required. They often have very different interfaces, often enabling you to follow step by step instructions to perform operations such as removing the effects of red eye, for example, or sepia tone an image. They are excellent for the beginner, and are usually much cheaper than Adobe Photoshop.

Image processing programs are known as “paint” programs, where the image is composed of a rectangular grid of pixels known as a “bitmap”. Each pixel is assigned



Screen shot of MGI PhotoSuite 4 showing range of tools available for image enhancement and retouching

a value, from one bit (black or white) to 24 bits per pixel for full colour images (some programs work with 32 bits, where a fourth 8 bit “alpha channel” stores information relating to masks and layers etc.). Because bitmapped images contain a fixed number of pixels, the resolution (pixels per inch) is dependent upon the size at which the image is printed.

Probably most images will benefit from enhancements to brightness, contrast or colour balance. All programs will have controls allowing the user to control these features very precisely, as well as producing some interesting special effects.



Image showing enhancement to brightness, contrast and colour

A very special feature of digital image processing is the ability to “hand colour” monochrome images, or to tone them to give an old fashioned look for example. This can be a really effective way of bringing old photos back to life, as well as producing new versions of new images.

An old and damaged print has been scanned, retouched, and then both sepia toned, and hand coloured. Getting the “right” colours is a matter of guess work!



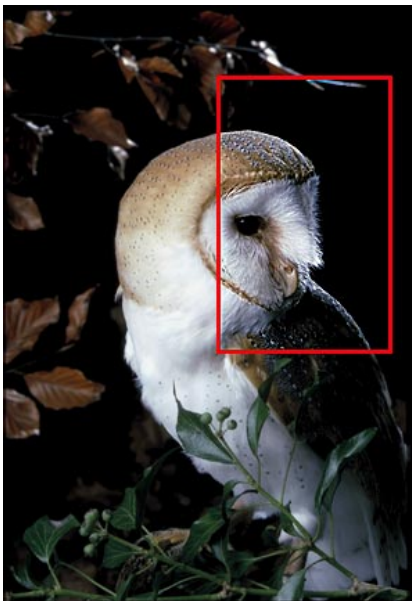
Having adjusted the image in terms of its brightness, contrast and colour, the image may need retouching. A whole range of tools are available for this including brushes, pencils, airbrushes and rubbers. One of the most useful is the “cloning tool” which enables you to clone parts of an image into other areas. A skin blemish for example can be covered completely successfully by cloning another area of skin over the top of the blemish. With practice, quite major restorations can be carried out.

Rather than simply retouching an image to improve it, you may want to manipulate it - perhaps bringing in elements from other images, or move various elements around. The potential is enormous, and only limited by your imagination!

Having got the right colour, brightness and contrast of an image, and perhaps retouched it or manipulated it, the final stage before printing is to sharpen the image. Probably most digital images will benefit from being sharpened. Basically, this feature increases the contrast between pixels to enhance fine detail - it doesn't allow you take an out of focus pictures and bring it into focus! If your software has it, use the “unsharp mask” filter for this operation. This rather unfortunately named filter can be adjusted, or “fine tuned” for best results.



Image of owl and moon, brought together in Adobe Photoshop. Note that the moon sits underneath the owl and the leaves, maintaining the correct sense of depth.



An image showing the use of the “sharpen filter” within the red box. Dramatic improvements can be made, but be careful not to overdo it!



Most image processing programs are supplied with a range of templates to help you create your own greetings cards, calendars or leaflets. The limit is your imagination!

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