Digital Photography Essay, Research Paper

Digital photography, which is also called ?digital imaging? since it does not involve the use of film started in the sixties. The original development of the technology is at NASA when they required that exploration spacecraft, unable to return to earth, to be capable of sending back pictures of their voyages.

The digital camera, like the standard film camera, uses a lens to focus the image on a sensor. The usual film camera depends on a film to capture the image but the digital relies on a sensor, either CCD or CMOS . As light hits the pixels that make up the sensor, it is converted to a current that is then sent to the ?Analogue to Digital Converter? or A-D converter.

When a photo is digitised, its colours are sampled from the sensor and converted to binary format. The smallest image element sampled is called a pixel. The digital image is like a map, where the information about the colour value of a pixel is understood as co-ordinates on the map. When the map is converted back to an image, the pixel goes to its position and colour in relation to the other pixels making up the image and the co-ordinates given to it.

This is how the camera maps out the image.

From the A-D converter, algorithms are then applied to the data converting it into a digital image. Sometimes, the size of the data generated by an image sensor can be very large. The larger the number of pixels making up the picture, the higher the resolution of the image and the larger the size of the data of the image. To deal with these large files, most digital cameras compress the data, as to make the size of the data of the image smaller. The way the data representing an image is electronically written is called an ?image file format?.

There are many different image file formats. Several of them use compression techniques to reduce the storage space required by the bitmap image data. These compression methods are classified in two ways: whether or not they remove detail and colour from the image. ?Lossless? methods compress image data without removing any detail from the image, while ‘lossy’ methods compress images by removing detail and colour depth. One of the more common standards of compression for digital cameras is the JPEG format.

The larger the image, and the more precise the sampling process, the larger the final digital file will be. To make the use of digitised photographs more utilised for transmission over Internet or for storing on a disk, algorithms have been constructed to decrease the size of data that is used in representing the image. When the process is reversed, the image is returns. Compression algorithms are useful when you need storage space, or to speed up data transmission on the Internet or anywhere. Without the JPEG format, the Internet would be much slower as this format is extensively used. To get large savings in the image files, many compression systems delete some of the information the file contains. The object is to make a compressed version of the image, so that once restored it is as close of a match to the original image as possible.

Many different algorithms have been developed to compress file sizes. Lossy compression is better than lossless because it can compress an image that can be as little as five percent of the original size. Lossy is where information from the image file is removed and lossless is just compressing the file.

The JPEG format was created specifically for the transmission and storage of photographic images. It is a lossy compression algorithm and it is made to remove different amounts of the data that originally made up the image. JPEG compression is designed to take advantage of a particular aspect of human visual perception: the fact that we perceive small colour changes less accurately than we perceive small changes in brightness.

The most important advantage coming from JPEG compression is the enormous reduction of file size. For digital cameras, this makes it possible to store a more images in the same amount of memory. JPEG compression makes it possible to send high quality images over the Internet, which would be never ever done using non-compression methods. The disadvantage of JPEG is that it does reproduce sharp edges very well or reproduce text; it tends to smudge the edges in the image. JPEG compression also reduces the range of colour in an image.

Data or image storage is an important aspect for all digital cameras. Most of these use ?flash memory? to store images. Many have 2 or 4 Megabytes of memory built-in to the camera itself and some also have a flash memory card slot, a feature that allows you to add memory.

When you compare film photography with commercial digital camera photography, film quite obviously gives the more superior resolution and quality. Film technology has been developing for over one hundred year and so nowadays; films are capable of incredible resolution. On the other hand, digital imaging is restricted by the amount of pixels it can capture on the sensor. This aspect has not been limited by technology but by economy. Very large scientific sensors, like those used in astronomy (such as the Hubbell Telescope), are quite expensive to produce, and give out data files that need extremely powerful computers to handle. That?s why the current digital cameras are evened out between cost and technology.

General picture taking, close-ups and other types of close range photos turns out good but scenic photography (such as a sunset) does not. The sensors on commercial digital cameras do not have large enough resolution to match the quality of standard film.

Digital images are quick to access. They can go from being in the camera to their being put into use, much faster than film photography can. Digital images also allow the photographer to easily correct and change errors, alter brightness and contrast or change the actual content of the image.

Until recently, printing colour digital images was very expensive. The development of colour printers has changed all that. There are now many different models of colour printers on the market, starting from couple of hundred dollars. Some printers are so good, that when given photographic quality paper their printouts are very close to what is achieved in a lab.

In the future, there will be digital cartridge systems, which would be able of being inserted in any point and shoot camera. When these products come to the shops, they will give people a new chose. Both systems complement each other. Digital point and shoot cameras give the option to preview and delete images, because their LCD displays. Digital cartridge systems would be for people who have their old film equipment. The way we take photographs has changed forever.